

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Chemistry is a branch of science that finds applications at home and industry. According to Akpan (2016), chemistry is the study of matter and the changes that matter undergoes. It is a branch of science which deals with the study of the nature, composition and properties of matter and the changes matter will undergo under different conditions. Chemistry is an experimental science whose study involves exploration of relationship between theory and experiment (Otor, 2013). The study of chemistry as a subject at the secondary school level helps students in developing basic science skills, knowledge and attitude-based competencies required for problem solving in their environment. Therefore, a poor foundation in chemistry at the secondary school level may jeopardize future achievement in the subject. One of the major variables that measure an individual's success or failure in chemistry is academic achievement. Academic achievement is often cognitive based and measured by examination or continuous assessment.

The factors that affect academic achievement in chemistry have been identified by scholars. According to Usman and Memeh (2012), the factors that negatively affect chemistry achievement include students' backgrounds, their self-efficacy, lack of interest and negative attitude towards chemistry. Teacher related factors like poor teacher preparation, inadequate teacher qualification, inadequate instructional materials and adoption of poor teaching methods also play a role (Dweck, 2015). In Nigeria, efforts are being made by researchers, government and non-governmental organizations to improve cognitive outcomes among chemistry students. Some of these efforts include organization of conferences, seminars and workshops for both students and teachers, organization of quizzes for students as

a motivational approach to learning, equipping the laboratory with modern laboratory equipment's and facilities etc. As available evidence indicates, achievement in chemistry at the secondary school level remains low and unimpressive (Viko, 2010). Factors that influence students' chemistry achievement at the senior secondary school are multivariate. Among the factors that have been identified to be responsible for low achievement in chemistry are teachers' qualification, quality of instruction and attitude, social psychological factors and social environmental factors (Udoh, 2008). However, according to Busari (2010), among the factors affecting students' achievement in general, less attention has been paid to student's self-efficacy, attribution styles and test anxiety. These are the factors under focus in this study because much attention has already been paid on ameliorating the effects of such factors related to teaching method, materials, environmental and other teacher-related factors yet students' achievement in chemistry has remained low.

The present researcher is poised to call attention to such social psychology based factors as self-efficacy, attribution styles and test anxiety as possible predictors of chemistry students' achievements. Self-efficacy is the belief in one's own capacity to organize and execute the courses of action required to manage prospective situation (Stajkovic & Luthans 2008). Studies show that one's own beliefs of efficacy is an important determinant of motivation that affect thought and action (Lunenburg, 2011). Since achievement in chemistry is both cognitively and psychomotor-based, it is possible that it can be affected by a students' self-efficacy.

Attribution is another important variable often related to academic achievement (Moskowitz, 2015). Naturally, human beings are in constant search for the factors that cause them or other people to behave the way they do. The process of assigning causes to people's behaviour is called attribution. This is collaborated by Wade and Tavris (2010) who defined attribution as a process by

which people are motivated to explain their own or others' behaviours by pointing at causes of those behaviours to a situation or disposition. However, when one makes dispositional attribution, the action is regarded as being caused by something in the person such as motive, effort or ability. A student with dispositional attribution can explain his/her achievement in chemistry test as due to his/her inadequate preparation for the test. Consequently, ability or inability of a chemistry student to understand and explain the causes of his or her poor achievement properly will definitely affect his future actions. This is why the present researcher thinks that studying chemistry student's attribution may be key to understanding their achievement in the subject.

Attribution style is the way you explain a negative event to yourself. The way you think about why a bad thing has happened to you. The conclusion you draw from a negative event, the meaning you attribute to it. Attribution style was introduced in Abramson, Saligman, and Teasdale (1978) as reformulated model of learned helplessness to account for people's individual differences in helplessness upon perceiving non-contingency between behaviour and outcomes. Some fundamental attributions have been found to have significant, enduring, and widespread effects on behaviour and decision making (Brown, Gray & Ferrara, 2015). In this context, attribution styles are cognitive variables that reflect how individuals explain bad events that befall them as measured by attribution scale. Students' success or failure in school can be attributed to so many factors such as environmental factors, students' self-effort, luck, teacher etc. (Kelley, 2012). This realization has led to the development of multidimensional attribution questionnaire (Brown, Gray & Ferrara, 2015). Therefore, in this context, attribution could be discussed under the following three dimensions in this research: student effort, luck and teacher. Related to the concept of attribution is test anxiety.

Test anxiety is another important variable often related to academic achievement (Cassady & Johnson, 2012). Anxiety is an unpleasant emotion experienced as dread, scare, alarm, fright, trepidation, horror or panic (Lewis, 2010). Test anxiety implies the debilitating experiences of anxiety as described by Lewis, during the preparation for a test or during the test itself. Minimal amount of anxiety can mobilize human beings to respond rapidly and efficiently, but excessive amount of anxiety may foster poor response and sometimes inhibit response (Cassady & Johnson, 2012). Test anxiety makes it hard for students to concentrate on test and perform adequately. Test anxiety can adversely affect a chemistry students carrying practical exercises, his or her attitudes specific to the materials, his or her peer groups and even the ability to record observations promptly and correctly' Hence, the present researcher is suspecting that test anxiety may be a contributing factor to poor achievement in chemistry.

Most studies done in Nigeria in this area of science education concentrated on the relationship existing between self-efficacy and one or two variables such as self-concept and peer influence (Adeyemo & Torubeli, 2008; Onyeizugbo, 2010; Kan & Akbas, 2016). The previous studies did not show the relative and combined contribution of self-efficacy, attribution styles and test anxiety. To the best of the researchers' knowledge, little or no study has been found in Nigeria that sought the extent of contribution among self-efficacy, attribution styles, test anxiety and academic achievement among secondary school chemistry students.

The present researcher also suspects that self-efficacy, attribution styles and test anxiety may be gender sensitive in affecting academic achievements generally and in chemistry in particular. This is because social behaviours of male and female students may affect their self-efficacy, attribution styles and test anxiety differently. Also, previous studies had inconclusive findings on gender influence in the relationship between the variables (Adeyemo & Torubeli, 2008; Onyeizugbo, 2010; Kan & Akbas, 2016). Consequently the researcher believes

that such in-depth study may reveal hitherto uncharted course in understanding academic achievements among chemistry students.

1.2 Statement of the Problem

The study of Chemistry as a subject at the secondary school level helps students in developing basic science skills, knowledge and competence required for problem solving in their environment. It is observed that secondary school students in Nigeria generally and Imo State in particular perform very poorly in Chemistry yearly. The dismal achievement of students in Chemistry over the years is a cause of serious concern. WAEC Chief Examiner's Report for six years (2012-2017) showed consistent poor academic achievement of students in Chemistry irrespective of gender.

Despite efforts made by teachers and educational researchers to improve students' achievement in the subject, the trend has not changed. This could be due to the fact that the contribution of the affective components of the learners such as academic self-efficacy, attribution styles and test anxiety on their achievement has not been examined. Therefore, the study on self-efficacy, attribution styles and test anxiety as predictors of chemistry achievement among secondary school students in Imo State is considered imperative as it will provide empirical evidence on the extent the variables affect chemistry achievement singly and together. The results will provide objective strategies to be adopted by relevant stakeholders towards improving chemistry achievement among students so that more of them could be admitted in science based courses to enable the country achieve her educational objectives generally and particularly in science and technology.

1.3 Purpose of the Study

The purpose of the study was to determine self-efficacy, attribution styles and test anxiety as predictors of chemistry achievement of secondary school students in Imo State. Specifically, the study determined the:

1. Self-efficacy scores of secondary school chemistry students in Imo state.
2. Attribution style scores of secondary school chemistry students in Imo state.
3. Test anxiety scores of secondary school chemistry students in Imo state.
4. Achievement scores of secondary school chemistry students in Imo state.
5. The extent to which self-efficacy scores of secondary school students predict their achievement scores in chemistry.
6. The extent to which attribution style scores of secondary school students predict their achievement scores in chemistry.
7. The extent to which test anxiety scores of secondary school students predict their achievement scores in chemistry.
8. The extent to which self-efficacy scores of secondary school male students predict their chemistry achievement scores.
9. The extent to which attribution style scores of secondary school male students predict their chemistry achievement scores.
10. The extent to which test anxiety scores of secondary school male students predict their chemistry achievement scores.
11. The extent to which self-efficacy scores of secondary school female students predict their chemistry achievement scores.
12. The extent to which attribution style scores of secondary school female students and their chemistry achievement scores.
13. The extent to which test anxiety scores of secondary school female students predict their chemistry achievement scores.
14. The extent to which self-efficacy scores, attribution style scores and test anxiety scores of secondary school students predict their chemistry achievement scores.

1.4 Significance of the Study

The findings of this study when published will be of immense benefits to secondary school Chemistry students, Chemistry teachers, parents, administrators, Ministry of Education and future researchers.

The findings from this study will add to existing literature on the role of self-efficacy, attribution styles and test anxiety in predicting chemistry achievement. The Ministry of Education may use the findings to develop policies that may promote improvement on students' self-efficacy, attribution styles and test anxiety in chemistry.

Moreover, findings from this study might give rise to a better way of comprehending students' attribution styles and academic self-efficacy. Students may realize the importance of the appropriate self-efficacy, attribution styles and test anxiety in enhancing chemistry achievement. Improved achievement in chemistry will enhance students' chances of pursuing science related courses at the university and in middle level colleges.

Furthermore, the findings may be an eye opener for school administrators and parents to see the need to create an appropriate school and home environments that nurture the appropriate academic self-efficacy, drive to achieve and the ability to handle school challenges. From the findings of this study, secondary school administrators will understand the roles of self-efficacy, attribution styles and test anxiety in predicting students' chemistry achievement. This knowledge, will equip them to tackle problems from different areas of need in the three components (self-efficacy, attribution styles and test anxiety) in order to improve the chemistry achievement scores of students.

The findings may be useful to teachers who may realize the need to enhance students' attribution styles and academic self-efficacy. Also, they will benefit from the findings of this study because identifying the relevance and importance

of students' efficacy in promoting chemistry achievement is a positive contribution to academic success of students. It will enable teachers' pay attention to students' efficacy and anxiety while teaching in the classroom. The findings of this study will therefore help teachers to champion awareness programmes that will reduce test anxiety, depression, anger, frustration and fear among students in secondary schools.

Lastly, the study will serve as a template for future research in related areas. Researchers will ascertain areas of interest and possible pitfalls to prevent ambiguity. The findings of this study when published, would also add to the body of literature on gender aspect in self-efficacy, attribution styles, test anxiety as predictors of academic achievement.

1.5 Scope of the Study

Although chemistry achievement may be influenced by many factors, this study only focused on three variables, that is, self-efficacy, attribution styles and test anxiety. Only senior secondary class two (SS II) students in public schools were involved in the study while teachers and school administrators who may have understanding of causes of low chemistry achievement in Imo State. The choice of SSII was because SSII students are more matured to respond to the instruments of data collection than the SSI students while SSIII students were already setting for external examinations. The choice of public schools was because of the poor achievement of public school students in Imo State. Respondent variable is delimited to gender.

1.6 Research Questions

The following research questions guided the study:

1. What is the self-efficacy score of secondary school chemistry students in Imo state?

2. What is the attribution style score of secondary school chemistry students in Imo state?
3. What is the test anxiety score of secondary school chemistry students in Imo state?
4. What is the achievement score of secondary school chemistry students in Imo state?
5. To what extent does self-efficacy score of secondary school students predict their chemistry achievement score?
6. To what extent does attribution style scores of secondary school students predicts their chemistry achievement score?
7. To what extent does test anxiety score of secondary school students predicts their chemistry achievement score?
8. To what extent does self-efficacy score of secondary school male students predicts their chemistry achievement scores?
9. To what extent does attribution style scores of secondary school male students predicts their chemistry achievement scores?
10. To what extent does test anxiety score of secondary school male students predicts their chemistry achievement scores?
11. To what extent does self-efficacy score of secondary school female students predicts their chemistry achievement scores?
12. To what extent does attribution style scores of secondary school female students predicts their chemistry achievement scores?
13. To what extent does test anxiety score of secondary school female students predict their chemistry achievement scores?
14. To what extent do self-efficacy, attribution style and test anxiety scores of secondary school students predict their chemistry achievement scores?

1.7 Research Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. Self-efficacy scores of secondary school students do not significantly predict their chemistry achievement scores in Imo state.
2. Attribution style scores of secondary school students do not significantly predict their chemistry achievement scores in Imo state.
3. Test anxiety scores of secondary school students do not significantly predict their chemistry achievement scores in Imo state.
4. Self-efficacy scores of secondary school male students do not significantly predict their chemistry achievement scores.
5. Attribution style scores of secondary school male students do not significantly predict their chemistry achievement scores.
6. Test anxiety scores of secondary school male students do not significantly predict their chemistry achievement scores in Imo state.
7. Self-efficacy scores of secondary school female students do not significantly predict their chemistry achievement scores in Imo state.
8. Attribution style scores of secondary school female students do not significantly predict their chemistry achievement scores in Imo state.
9. Test anxiety scores of secondary school female students do not significantly predict their chemistry achievement scores in Imo state.
10. Self-efficacy scores, attribution style scores and test anxiety scores of secondary school students do not significantly predict their chemistry achievement scores in Imo state.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter deals with the review of literature relevant to the present study under the following sub-headings:

2.1 Conceptual Framework

Self-Efficacy

Attribution Styles

Test Anxiety

Academic Achievement

Gender

2.2 Theoretical Framework

Social Learning Theory

Attribution Theory

Test Anxiety Theory

2.3 Theoretical Studies

Self-efficacy and Related Beliefs

How Attributions Influence Behaviour

How Attributions are communicated to Learners

Individual Differences in Attributions

Implications of Attribution to Educators

Self-Efficacy and Anxiety

Self-Efficacy and Academic Achievement

Attribution and Academic Achievement

2.4 Empirical Studies

Self-efficacy and academic achievement

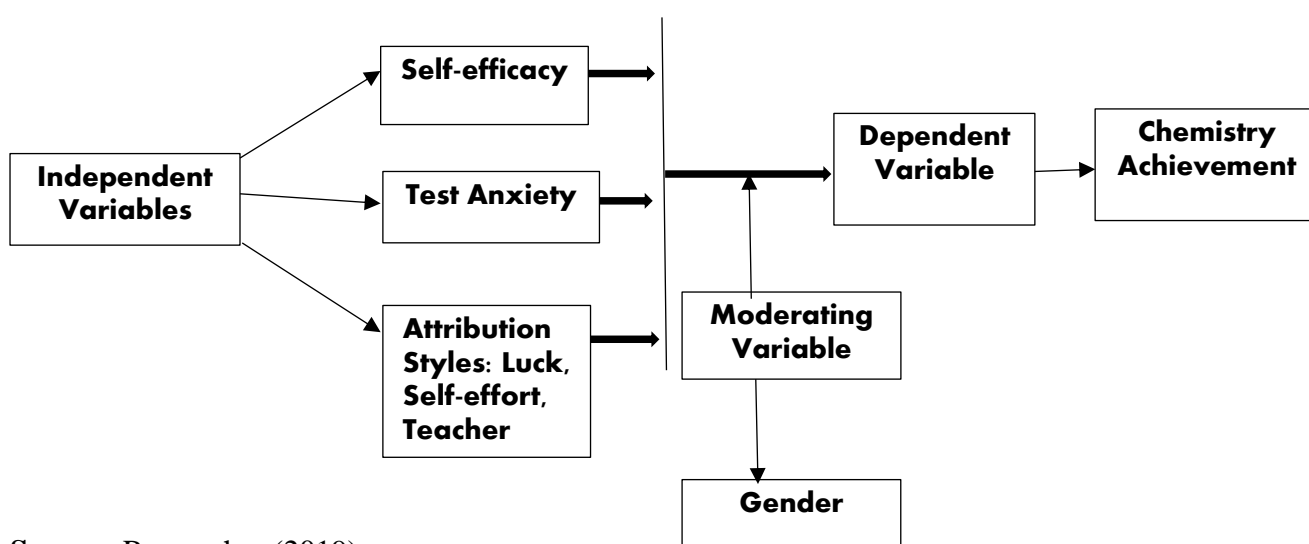
Attribution and academic achievement

Test anxiety and academic achievement

2.5 Summary of Review of Related Literature

2.1 Conceptual Framework

Figure 1: Schematic diagram of the study concepts



Source: Researcher (2019)

This section presents the concepts that formed the conceptual framework of the study, such as, self-efficacy, attribution, test anxiety and academic achievement.

Self-efficacy

Self-efficacy is commonly defined as the belief in one's capabilities to achieve a goal or an outcome (Karin, 2010). Students with a high sense of efficacy are more likely to challenge themselves with difficult tasks and be intrinsically motivated. These students will invest a high degree of effort in order to meet their commitments and attribute failure to internal rather than external factors. Self-efficacious students also recover quickly from setbacks and ultimately are likely to achieve their personal goals. Students with low self-efficacy, on the other hand, believe they cannot be successful and thus are less likely to make a concerted and

extended efforts and may consider challenging tasks as threats that are to be avoided. Thus, students with low self-efficacy have low aspirations which may result in disappointing academic performances becoming part of a self-fulfilling feedback cycle (Margolis & McCabe, 2016).

Self-efficacy is a person's judgment about being able to perform a particular activity (Piper, 2010). It is a student's "I can" or "I cannot" belief. Unlike self-esteem, which reflects how students feel about their worth or value, self-efficacy reflects how confident students are about performing specific tasks. High self-efficacy in one area may not coincide with high self-efficacy in another area. Just as high confidence in snow skiing may not be matched with high confidence in baseball, high self-efficacy in mathematics does not necessarily accompany high self-efficacy in spelling. Self-efficacy is specific to the task being attempted. However, having high self-efficacy does not necessarily mean that students believe they will be successful. While self-efficacy indicates how strongly students believe they have the skills to do well, they may believe other factors will keep them from succeeding (Piper, 2010). Self-efficacy beliefs can influence an individual to become committed to successfully execute the behaviors necessary to produce desired outcomes.

The term self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required producing given attainments (Bandura, 2007). According to Bandura, self-efficacy beliefs constitute the key factor of human agency. He stated that efficacy beliefs influence the courses of action people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, their resilience to adversity, whether their thought patterns are self-hindering or self-aiding, how much stress and depression they experience in coping with environmental demands, and the level of accomplishments they realize (Bandura, 2007). Humans make life decisions based on our perceived self-efficacy by undertaking activities

and choosing situations we deem to be within our capabilities for success (Bandura, 2013).

Additionally, activities associated with failure are avoided. When humans have a strong sense of perceived self-efficacy, they put forth a greater effort to accomplish a task despite the obstacles they encounter than those who have a weak sense of self-efficacy. It is believed that students who have a higher degree of self-efficacy will have a higher intention to remain enrolled in college and will be more likely to persist in the face of external obstacles. Though self-efficacy is an important influence on behavior, it is not the only influence. Behavior is a function of many variables. In achievement settings, such as higher education, other important variables include skills, outcome expectations, and the perceived value of outcomes (Schunk, 2011). When the necessary skills are lacking, self-efficacy will not produce competent performances. According to Bandura (2007), once efficacy beliefs are formed, they are not stable. They can vary in strength because the individual is constantly evaluating new information. However, once efficacy beliefs have been established over long periods of time and based on a large amount of information, they are unlikely to be changed. Because self-efficacy beliefs are specific in nature, it is impossible to discuss “general” or “global” self-efficacy. For example, students may have high self-efficacy beliefs about their abilities to thrive in social situations, but weak efficacy beliefs about their abilities to succeed academically. In the context of this study, self-efficacy refers to belief secondary school students have about their ability to succeed in their academic pursuits or activities.

Attribution

Attributions are subjective reasons and explanations given by people for their failure or success in a given task, test or an activity (Weiner, 2010). Traditionally, a set of four main attributions have been suggested. These are ability, effort, task difficulty and luck. However, research has identified a number

of other possible attributions, such as interest, health, mood, materials, means, strategies used by learners, and significant others (Peacock, 2009). Attribution is concerned with the thoughts people have about events or situations and what causes them, which offers us one method for understanding human behavior (Weiner, 2010). Specifically, an attribution is an expression of the way a person perceives the relationship between a cause and an outcome. One of the most fundamental ways of judging outcomes, of course, is whether an outcome is judged to be a success or failure. Therefore, attributions provide explanations about why today's stock market rose or fell, why our favorite team won or lost, and why someone is happy whereas someone else is depressed.

Attributions also are basic to judgment that we make in our daily lives. For instance, we offer explanations to ourselves and to others about why we did well or poorly on academic assignments by receiving satisfactory or unsatisfactory grades, why we or others were accepted to prestigious universities with scholarships, or why it was difficult to start writing on one assignment, while it was easy to start and complete another. According to Peterson et al. (2012), these varying "explanations" for success and failure are indicators of individuals showing different characteristic attribution tendencies in facing different or even the same situations. Peterson et al. termed these different attribution tendencies as attribution style. In response to attribution theory and the concept of attribution style, psychologists and educators have debated how to promote academic achievements and have attempted to determine factors that affect students' responses to academic success and failure in academic settings. Therefore, in this context, attribution refers to an expression of the way a secondary school student perceives the cause of an outcome.

Attribution Style

Attribution style is the way you explain a negative event to yourself. The way you think about why a bad thing has happened to you. The conclusion you

draw from a negative event, the meaning you attribute to it. Attribution style can also be seen as the type of attributions that we make for the events that occur to us. Attribution style was introduced in Abramson, Saligman, and Teasdale (1978) as reformulated model of learned helplessness to account for people's individual differences in helplessness upon perceiving non-contingency between behaviour and outcomes. Some fundamental attributions have been found to have significant, enduring, and widespread effects on behaviour and decision making (Abramson et al, 1978). In this context, attribution styles are cognitive variables that reflect how individuals explain bad events that befall them as measured by attribution scale. Students' success or failure in school can be attributed to so many factors such as environmental factors, students' self-effort, luck, teacher etc. This realization has led to the development of multidimensional attribution questionnaire (Abramson et al, 1978).

Attribution to Effort, Luck and Teacher

An attribution refers to constructions imposed by perceivers to account for the relation between an action and an outcome. Based on this, the principal causes influencing attributions for perceived success and failure in life were determined as effort, teacher, and luck. The attribute dimensions of the above main causes have been generally analyzed as follows: while teacher is an external, unstable, and relatively uncontrollable factor, effort is an internal, unstable, and controllable factor while luck is an external, unstable, and relatively uncontrollable cause. The effort attribution is related to the dimension of controllable and all of the others are related to the dimension of uncontrollable. Most of the time, people would tend to attribute their successes to the internal, stable and controllable factors, whereas they would tend to attribute their failures to the external, unstable and uncontrollable factors. This is thought to be as the correct method of people as attribution preference (William & Burden, 2000). This seems to be related to the hedonic bias which is also known as self-serving attributional bias in that individuals explain success in terms of internal causes (e.g. ability, effort) and

failure as resulting from external, situational factors (e.g. teacher, task difficulty, luck) to protect their self-esteem and avoid depression (Weiner, 2000).

Attribution theory has particular importance in science learning because of the common failure students experience in learning chemistry (Dornyei, 2005) or failure in achieving the desired level of proficiency. It definitely provides some clues about the future behaviours of the learners by shedding light into the past behaviours of them. Thus, understanding the possible causes of events can give some insights into understanding learners' success as well as failure. With respect to chemistry learning, attribution theory explains how chemistry learners evaluate their success or failure and consequently, how their perceptions affect their performance (Weiner, 2000). Helping learners to be aware of their perceptions of attributions brings some advantages to chemistry learning and teaching. It can be assumed that chemistry learners who are aware of their attributions can understand the cognitive reasons behind their achievement easily as suggested by Williams and Burden (2000).

In the field of science learning, the significance of attribution theories has also been well understood and revealed by most of the science education researchers (Erten, 2015; Mohammadi & Sharififar, 2016). Among those studies, Gobel and Mori (2007) determined that less successful learners attributed their failure to a lack of ability and effort while more successful learners attributed their success to teachers and the learning environment. In addition, results of Pishghadam and Motakef's (2011) study showed that university students from different majors attributed their successes and failures to different factors. Moreover, Hassaskhah, and Vahabi (2010) indicated that self-effort was the most cited reason for failure in language studies. Lastly, the results of Mohammadi and Sharififar's (2016) study indicated that learners attributed their success and failure to both internal and external factors but giving more priority to external factors. It was also revealed that students do not appreciate adequately the effects of sufficient endeavour in foreign language studies. Even though effort is among the

factors which can be controlled by the learners, participants do not attribute it to success as much as the uncontrollable ones such as ability, interest and task difficulty. The least cited two factors are respectively the effects of teacher, school, and luck which are among the external factors that cannot be controlled easily.

The effects of teacher or school or in other words, learning environment is not seen as an important factor of success by the participants. It is in contrast with some other results of the researchers mentioned in the literature such as Gobel and Mori (2007) who suggested that successful students mostly attribute to teachers for their success. However, the psychological effect of luck on learners' performance as debilitating or facilitative should not be ignored. It might be thought that students perceiving themselves as lucky or unlucky might have changing mood during their studies. When it comes to the attributions for failure, the study indicated that learners differed considerably in terms of their reasons of failure. Contrary to their attributions to success, majority of learners endorsed effort as their first reason of failure which is also in line with the most studies conducted. The next factor which was mostly endorsed by learners is interest, followed by the effect of teacher and school, ability, task difficulty and finally, luck.

Test Anxiety

Anxiety is a very common phenomenon in psychological studies, which has been researched for many years and in fact it is the most common reaction to stress (Sarason, 2014). Test anxiety leads to behavioral, physical and phenomenological reactions along with the test (Zeidner, 2008). According to Basavanna (2010), anxiety is a highly unpleasant affective state similar to intense fear which can include feelings of threat, vague objectless fear, a state of uneasiness and tension, and a generalized feeling of apprehension. Borrowing from Freud, Basavanna identifies three types of anxiety; Reality anxiety (an emotional reaction to

perception of danger in the external world); Neurotic anxiety (an affective reaction to threat from the internal world; and Moral anxiety (an emotional reaction to perception of danger from the superego. Anxiety thus occurs to the body system after one has experienced a threatening situation. An automatic physiological response is triggered to prepare to protect him/herself, or escape from the source of threat. If the activity is carried out, then the changes are reversed, however, if no activity is done, the body continues to remain in the “charged state” for longer than normal, and the resulting changes become a disturbing source of anxiety. This leads to further activation of the flight or fight response and the whole cycle is continued, (Galvin, 2014). Anxiety is described as subjective feelings associated with worries, nervousness and tension (Spielberger, 2016). Anxiety is a complex psychology term including many variables. Simply put, anxiety is the feeling of worries along with increased vigilance, increased sympathetic nervous system and difficulty in concentrating (Kelly, 2012). Anxiety is the state of alertness brought up with feelings of tension, fear, and worries that people show when they consider themselves threatened (Spielberg & Gorsuch, 2010). Increased anxiety levels invite the individual to retreat to flatter and simpler behaviours, to have anxiety and to be over-focused on pleading other. However, mid-level anxiety stimulates and protects the organism and provides motivation. When managed well, anxiety helps the individual to work more to be successful and to take measures against the unfavourable (Busari, 2007).

Test anxiety is a multi-dimensional phenomenon that involves worry, emotionality, and behavioral reply to being preoccupied by the possible negative outcome of academic scores (Chapell, Blanding, Silverstein, Takahashi, Newman, Gubi & McCann, 2015). According to Onyeizugbo (2010), test anxiety seems like a benign problem to some people, but it can be potentially serious when it leads to high levels of distress and academic failure in otherwise capable students. Thus, test or examination anxiety serves as stress, tension and strain that interfere with the proper functioning of an individual’s body and mind. It is accompanied

by feeling of helplessness because the anxious person feels blocked, unable to find a solution to his problem. In the context of this study, test anxiety refers to a student's feeling of tension that interferes with academic situations and can cause a student to lose self-confidence and perform poorly in a given task.

Academic Achievement

Academic achievement is the outcome of education, the extent to which a student, teacher or institution has achieved their educational goals. Academic achievement is commonly measured by examinations or continuous assessment. Academic achievement is generally regarded as the display of knowledge attained or skills developed in the school subject (Busari, 2010). It is the level of performance in school subjects as exhibited by an individual (Ireoegbu, 2012). In the school setting, it is referred to as the exhibition of knowledge attained or skills developed in school subjects. Freeman (2015) defines a test of educational achievement as a test designed to measure knowledge, understanding and skill in a specific subject or group of subjects. Trow (2016) defined academic achievement as attained ability or degree of competence in school tasks usually measured by standardized test and expressed in grades or units based on norms, derived from a wide sampling of pupil performance.

After a test has been administered and scored, a post hoc analysis is often performed in order to evaluate the test's effectiveness. This procedure often involves an analysis of the individual items on the test. Test scores or marks assigned by teachers are indicators of this achievement. Test is the schools evaluation of pupils' class work as quantified on the basis of marks or grades (Adedipe, 2015). These marks assigned by school could either be high or low, which means that academic achievement, could either be good or bad. This study defines academic achievement as the cumulative average results obtained by the students in their first, second and third term chemistry examination.

2.2 Theoretical Framework

The theoretical framework of this study is based on Bandura's social learning theory, Heider's attribution theory and test anxiety theory as reviewed below:

Social Learning Theory (Bandura)

Social Learning Theory, theorized by Albert Bandura in 1977, posits that people learn from one another, via observation, imitation, and modeling. The theory has often been called a bridge between behaviorist and cognitive learning theories because it encompasses attention, memory, and motivation. People learn through observing others' behavior, attitudes, and outcomes of those behaviors. Most human behaviour is learned observationally through modeling: from observing others, one forms an idea of how new behaviors are performed, and on later occasions this coded information serves as a guide for action. (Bandura, 1977). Social learning theory explains human behaviour in terms of continuous reciprocal interaction between cognitive, behavioral, and environmental influences. Various factors increase or decrease the amount of attention paid. Includes distinctiveness, affective valence, prevalence, complexity, functional value. One's characteristics (e.g. sensory capacities, arousal level, perceptual set, past reinforcement) affect attention. Social learning theory has sometimes been called a bridge between behaviorist and cognitive learning theories because it encompasses attention, memory, and motivation.

Social learning theory is related to the present study because Bandura and others have advanced the concept of self-efficacy. This increasingly recognized psychological construct deals specifically with the control of human action through people's beliefs in their capabilities to affect the environment and produce desired outcomes by their actions. For instance, unless students believe that they can gather up the necessary behavioural, cognitive, and motivational resources to successfully execute the academic task, they will most likely dwell on the formidable aspects of the required performance, exert insufficient effort, and, as a

result, not do well or even fail on the task. This personal confidence, or more precisely self-efficacy, plays a pivotal role in social learning theory. In his recent, comprehensive book on self-efficacy and personal control, Bandura (1977) provides an in-depth conceptual analysis and empirical support of how self-efficacy operates in concert with social learning determinants represented by social learning theory in determining human motivation, adaptation, and change. We believe that the conceptual richness of social learning theory and the implications that self-efficacy seems to have for human performance in organizations can make a value-added contribution to work motivation and practice. Since social learning theory states that people learn more by observing and imitating the desired behaviours of others, a strong connection has been found between this theory and the present study in terms of investigating self-efficacy as related to academic achievement, which is a variable in this study.

Attribution Theory

Attribution theory was propounded by Fritz Heider in 1958. In his theory, he states that people observe, analyze, and explain behaviors with explanations. Although people have different kinds of explanations for the events of human behaviours, Heider found it is very useful to group explanation into two categories; Internal (personal) and external (situational) attributions. When an internal attribution is made, the cause of the given behaviour is assigned to the individual's characteristics such as ability, personality, mood, efforts, attitudes, or disposition. When an external attribution is made, the cause of the given behaviour is assigned to the situation in which the behaviour was seen such as the task, other people, or luck (that the individual producing the behaviour did so because of the surrounding environment or the social situation). These two types lead to very different perceptions of the individual engaging in a behaviour.

This theory was subsequently developed by others such as Harold Kelley and Bernard Weiner. According to them, people make attributions to understand

the world around them in order to seek reasons for an individual's particular behaviour. When people make attributions they are able to make judgments as to what was the cause or causes of a certain behaviour. Attribution theory assumes that people try to determine why people do what they do, i.e., attribute causes to behaviour. A person seeking to understand why another person did something may attribute one or more causes to that behaviour.

Attribution theory is related to the present study because it has been used to explain the difference in motivation between high and low achievers. According to attribution theory, high achievers will approach rather than avoid tasks related to succeeding because they believe success is due to high ability and effort which they are confident of. Failure is thought to be caused by bad luck or a poor examination, i.e. not their fault. Thus, failure doesn't affect their self-efficacy but success builds pride and confidence. On the other hand, low achievers avoid success-related chores because they tend to (a) doubt their ability and/or (b) assume success is related to luck or to "who you know" or to other factors beyond their control. Thus, even when successful, it is not as rewarding to the low achiever because he/she does not feel responsible, i.e., it does not increase his/her pride and confidence.

Test Anxiety Theory

George Mandler and Seymour Sarason developed the test anxiety theory in 1952. The theory states that anxiety present in testing situations is an important determinant of test performance. Individuals that become highly anxious during tests typically perform more poorly on tests than low-test anxious persons, especially when tests are given under stressful evaluative conditions such as a post-secondary exam. The feelings of forgetfulness or drawing a "blank" are developed because of anxiety-produced interference between relevant responses and irrelevant responses generated from the person's anxious state. The difference in performance of a high-anxious test taker compared to a low-anxious test taker

is largely due to the difference in their ability to focus on the tasks required. A low-anxious test taker is able to focus greater attention on the tasks required of them while taking the test, while a high-anxious test taker is focused on their internal self, and the anxiety they are feeling. Anxious test takers do not perform adequately on the test as their attention is divided between themselves and the test. Therefore, students with high test anxiety are unable to focus their full attention on the test. Furthermore, anxiousness is evoked when a student believes that the evaluative situation, such as an assessment, exceeds his or her intellectual, motivational, and social capabilities.

Some of the thoughts that students with high cognitive test anxiety are constantly dealing with are comparing self-performance to peers, considering the consequences of failure, low levels of confidence in performance, excessive worry about grades, feeling that they are unprepared for tests, and loss of self-worth. Anxiety reactions can be generalized from previous experiences to testing situations. Feelings of inadequacy, helplessness, anticipations of punishment or loss of status and esteem manifest anxiety responses. As well, the presence of an audience can debilitate the performance of high anxious test takers and increase the performance of low anxious test takers. Interestingly, persons who score high on anxiety scales tend to describe themselves in negative, self-devaluing terms. Highly anxious test takers also blame themselves for their failure significantly more than low anxious test takers.

Text anxiety theory is related to the present study in the sense that the theory claimed that the negative influence of test anxiety is due to the fact that test-anxious persons divide their attention between personal variables and variables connected to their academic task. In contrast, non-test-anxious persons are able to focus their attention more on the task itself. Among test-anxious students these differences lead to a reduced ability to deal with cognitive tasks. This theory views the low performance of test-anxious students as stemming from

their deficient knowledge of the school material and their awareness that they are not well prepared for the test. Test anxiety reduces the performance of those who experience it (Mandler & Sarason, 1952). A somewhat different viewpoint is that severe test anxiety is caused by high personal standards of persons who expect maximum success and are afraid that they cannot meet their own standards. It has been proven that test-anxious students see the test situation as threatening, and often react by worrying and thinking irrelevant thoughts that interfere with effective academic achievement. This goes to show that test anxiety is associated with depressed academic achievement.

2.3 Theoretical Studies

This section reviewed theoretical studies that are related to the present study as follows:

Self-efficacy and Related Beliefs

Self-efficacy beliefs differ conceptually and psychometrically from closely related constructs, such as outcome expectations, self-concept, and perceived control. The conceptual distinction that Bandura (2002) drew between academic self-efficacy and outcome expectancies was studied psychometrically in research on reading and writing achievement. Shell, Murphy, and Bruning (2009) measured self-efficacy in terms of perceived capability to perform various reading and writing activities, and they assessed outcome expectancies regarding the value of these activities in attaining various outcomes in employment, social pursuits, family life, education, and citizenship. Efficacy beliefs and outcome expectancies jointly predicted 32% of the variance in reading achievement, with perceived efficacy accounting for virtually all the variance. Only perceived self-efficacy was a significant predictor of writing achievement. These results not only show the discriminant validity of self-efficacy measures, they support Bandura's contention that self-efficacy plays a larger role than outcome expectancies in motivation. One

of closest constructs to self-efficacy is self-concept. The latter belief is a more general self-descriptive construct that incorporates many forms of self-knowledge and self-evaluative feelings (Marsh & Shavelson, 2015).

How Attributions Influence Behaviour

Many studies indicate that the types of attributions that individuals make influence their subsequent behaviors in predictable ways. Both the expectancy beliefs and the emotions that individuals experience as a result of the attribution process tend to determine future behaviors. Research generally indicates that academic achievement is improved and enhanced when learners attribute academic outcomes to factors such as effort and the use of appropriate study strategies; in contrast, academic achievement is hindered when learners attribute their failure to factors such as lack of ability or chronic health problems and attribute their success to luck. Consequently, a student who attributes failure on an examination to a lack of effort (e.g., she did not study enough the week before the exam) may be motivated to put forth additional effort when preparing for a subsequent exam. In contrast, a student who attributes failure on an examination to a lack of ability (i.e., she believes that she does not have adequate ability in the examination area) will be unlikely to exert effort for a subsequent examination.

How Attributions are communicated to Learners

Attribution information is communicated to learners in a variety of ways. Teachers communicate important information to their students through their feedback on assignments, on graded exams, and during classroom instruction. When teachers communicate to students that failures are due to the use of inappropriate strategies or due to inappropriate effort, students are likely to be motivated to try harder or to use more appropriate strategies in the future. Teachers provide this feedback to students in a variety of ways. One common way is through comments on written work. Some teachers provide general feedback,

using phrases such as “Good work” or “Needs work.” Research indicates that specific feedback is more useful to students because it can assist students in developing adaptive attribution beliefs. Therefore, it is may be effective to write a more specific comment (e.g., “I know you can do better; you need to spend more time studying the night before a test”) when a teacher knows that a student has not been putting forth enough effort. It is important, however, to be sure that lack of effort truly is the problem. Researchers such as Martin Covington caution that when teachers encourage students to make attributions to effort (i.e., “You didn't try hard enough”), some students may interpret such comments as an indication of the teachers' lack of belief in the students' true abilities. In many instances, helping students to attribute their failure to not using appropriate strategies or to their lack of specific content knowledge may be more appropriate than assuming students are not trying.

Teachers also need to provide differential feedback to students. Educators must acknowledge that progress and achievement will be different for individual students. If students raise their grades from a “D” to a “C,” teachers might choose to offer praise, if this change represents an important, meaningful new accomplishment for the students. In terms of attributions, scholars who study the effects of feedback and learning, such as Jere Brophy, would argue that teachers should provide feedback that will promote attributions to effort or appropriate strategy use (e.g., “You did great! I am proud of you. The fact that you used the correct formulas this time to solve the math problems shows me that you have really worked on learning when and why to use the appropriate formulas, good job!”).

Parents also communicate information to children and adolescents that affect their attributions. If a participant loses a gymnastics competition, one parent might comment, “It is okay; gymnastics is very difficult,” whereas another parent might state, “You didn't use the techniques that your coach showed you last

week.” The first statement might produce ability attributions (e.g., “This is difficult; I don't expect you to be able to do well”), whereas the latter statement might encourage the gymnast to attribute the failure to a controllable cause, to something that can be altered for a better outcome next time.

The information that parents communicate to children and adolescents may be based at least in part on parents' own attributions for their children's successes and failures. When children succeed or fail at tasks in school, parents form their own beliefs about the causes of their children's experiences. Some research suggests that there may be predictable patterns to these parental beliefs. For example, as indicated by Yee and Eccles, some research indicates that in the domain of mathematics, parents are more likely to attribute their daughter's success to effort, but to assume the same success in their son is due to mathematical ability.

Individual Differences in Attributions

Attribution patterns differ among individuals. Development also plays a role in attribution. For instance, according to Nicholls, young children and older adolescents have different understandings of concepts, such as ability, that are central to attribution theory. Younger children do not easily differentiate between concepts, such as ability and effort, whereas older adolescents are better able to understand such distinctions. Consequently, attributions may take on different meanings for students at different stages of cognitive development.

Although there has not been much research on ethnic differences in attributions, Sandra Graham has summarized the findings to date of research in this area. Graham notes African-American students tend to make external attributions more often than white students. Although internal attributions are generally considered more adaptive for white students, Graham suggests that greater belief in external causes may be adaptive for African American students (1994). Graham also notes that in order to truly understand the role of attributions

in the study of motivation in minority students, it is important to consider the complex relations between gender and ethnicity (1997).

Studies of gender differences in attributions have yielded somewhat mixed results. Some studies indicate that female students are more likely to attribute negative outcomes to internal and stable causes and to attribute successful outcomes to unstable, external causes (e.g., “My successes are due to good teaching and good luck; my failures are because I'm not good enough”); however, other research suggests that there are no gender differences in attributional patterns. Clearly, additional research on this topic is needed.

Implications of Attribution to Educators

There are many practical implications of attribution theory for educators. First, teachers need to realize that they can affect the types of attributions that students make. Teachers affect students' attributions on a daily basis, through their comments to students, feedback on assignments and examinations, and the types of praise that they offer during instruction. These comments can have important long-term effects on student learning and motivation. A student who consistently learns to attribute failures to a lack of ability in a particular subject area is unlikely to continue to be motivated to achieve in that subject area in the future. Educators need to remember the power they have in shaping students' attributions.

Second, teachers can educate parents about attributions. Since parents provide feedback and make comments to their children about performance on academic work, teachers can encourage parents to provide effective feedback. For example, teachers can send home a weekly newsletter to parents explaining what is being learned in class and offering specific suggestions to parents about providing appropriate feedback to children.

Finally, educators should be aware that students do think about the causes of their own successes and failures. Teachers can engage students in conversation to learn about their students' attributions and to monitor potentially inaccurate and

harmful beliefs. Teachers may be surprised by some of their students' attribution beliefs; one-on-one conversations may provide insight to teachers and provide opportunities for shaping students' beliefs about their performance.

Self-Efficacy and Anxiety

In evaluating the relationship between self-efficacy and anxiety on the reading and listening proficiency of third and fourth semester French students, this study was grounded in Bandura's social cognitive theory and its depiction of the relationship between self-efficacy and anxiety. Bandura (2002) defined anxiety as "a state of anticipatory apprehension over possible deleterious happenings" (p.137). Individuals experiencing anxiety embody apprehension and avoidant behavior that often interfere with performance in everyday life as well as in academic situations.

In social cognitive theory, one's perceived sense of efficacy plays a key role in the arousal of student anxiety. Those with a stronger sense of efficacy are more apt to take on the "deleterious happenings" that breed stress with positive expectations and are often more successful in transforming them into positive events. Individuals, therefore, only experience anxiety when they believe themselves to be incapable of managing potentially detrimental events (Bandura, 2002).

According to social cognitive theory, as a result of a student's weakened sense of efficacy in a particular academic subject, he/she becomes anxious about the corresponding academic demands. In addition, social cognitive theory proposes that anxiety or physiological arousal is also one of the four sources of self-efficacy (Bandura, 1997). Consequently, anxiety serves as both a source and effect of self-efficacy beliefs. Self-efficacy research in mathematics, science, and L1 writing has revealed that students' perceived efficacy possesses a stronger relationship to academic achievement than levels of anxiety or apprehension

(Pajares & Britner, 2011; Pajares & Graham, 2009; Pajares & Johnson, 2016). Such results reveal that it is one's sense of efficacy to control or dismiss apprehensive emotions that accounts for anxiety (Bandura, 2002).

Self-efficacy and Academic Achievement

There is a significant body of research studies that have clearly demonstrated that students' self-efficacy beliefs relate to their academic performance (Bandura, 2002; Pajares, 2014). These studies suggest that high self-efficacy is positively associated with academic achievement. Self-efficacy affects effort and volition, including persistence (Bandura, 2002). Furthermore, Pajares (2016) found that skill, ability and previous accomplishments are significant predictors of self-efficacy and academic performance. Axiel and Parker (2013) explored the relation of students' self-efficacy beliefs to examination performance. The results showed that the self-efficacy measures studied were significantly related to examination performance. The findings showed that the inaccuracy of self-efficacy beliefs was related to examination performance. Students who underestimated their examination marks and course grade, namely the pessimistic students, tended to do better in their performance and the opposite held true for students who were optimistic. One plausible explanation was that pessimistic students felt a greater need to increase effort to prepare for examination and course work, and in the process achieved better results.

Christensen, Barnes and Rees (2012) studied the relationship between students' beliefs about their abilities in an accounting course and their examination performance in the course. They examined students' ability to accurately predict their course standing in mid-semester and its relation with success in the course, using path analysis for a sample of 214 students. Their findings showed that the more conservative a student's self-efficacy, the higher the final examination scores and the final course grade. They concluded that when students' predictions are below outcomes, subsequent performance improves, and when predictions are

above outcomes, subsequent performance deteriorates. Williams & Williams (2016) studied the relationship between self-efficacy and science performance of primary school children. Her subjects, who were fifty-two English primary school children aged between 10 and 12 years, completed self-efficacy questionnaires. The study concluded that self-efficacy was positively correlated with academic performance.

Self-efficacy beliefs have also shown convergent validity in influencing such key indices of academic motivation as choice of activities, level of effort, persistence, and emotional reactions. There is evidence (Bandura, 2002) that self-efficacious students participate more readily, work harder, persist longer, and have fewer adverse emotional reactions when they encounter difficulties than do those who doubt their capabilities. In terms of choice of activities, self-efficacious students undertake difficult and challenging tasks more readily than do inefficacious students.

Bandura and Schunk (2011) found that students' mathematical self-efficacy beliefs were predictive of their choice of engaging in subtraction problems rather than in a different type of task: the higher the children's sense of efficacy, the greater their choice of the arithmetic activity. Zimmerman and Kennedy (2016) also found self-efficacy to be highly correlated with students' rated intrinsic interest in a motoric learning task as well as in a writing revision task. Furthermore, measures of self-efficacy correlate significantly with students' choice of majors in college, success in course work, and perseverance (Hackett & Betz, 2009; Lent, Brown, & Larkin, 2014). Self-efficacy beliefs are predictive of two measures of students' effort: rate of performance and expenditure of energy. For example, Schunk and colleagues found that perceived self-efficacy for learning correlates positively with students' rate of solution of arithmetic problems (Schunk, Hanson & Cox, 2015).

Salomon (2014) has found that self-efficacy is positively related to self-rated mental effort and achievement during students' learning from text material that was perceived as difficult. Regarding the effects of perceived self-efficacy on persistence, path analyses have shown that it influences students' skill acquisition both directly and indirectly by increasing their persistence (Schunk, 2011). The direct effect indicates that perceived self-efficacy influences students' methods of learning as well as their motivational processes. These results validate the motivational role that self-efficacy plays in motivating persistence and academic achievement. In a meta-analytic review of nearly 70 studies of persistence and rate measures of motivation, Multon, Brown, and Lent et al (2011) found a significant positive effect size of students' self-efficacy beliefs. Student's beliefs about their efficacy to manage academic task demands can also influence them emotionally by decreasing their stress, anxiety, and depression (Bandura, 2002). For example, Pajares and Kranzler (2015) have studied the relationship between self-efficacy and students' anxiety reactions regarding mathematics. Although the two measures were negatively correlated, only self-efficacy was predictive of mathematics performance when compared in a joint path analysis. There is also evidence that students' performance in academically threatening situations depends more on efficacy beliefs than on anxiety arousal. Siegel, Galassi and Ware (2015) found that self-efficacy beliefs are more predictive of math performance than is math anxiety. The strength of efficacy beliefs accounted for more than 13% of the variance in their final math grades, whereas math anxiety did not prove to be a significant predictor. These studies provide clear evidence of the discriminant and predictive validity of self-efficacy measures, and they suggest particular benefit if educators focus on fostering a positive sense of personal efficacy rather than merely diminishing scholastic anxiety.

As previously mentioned, the relationship between self-efficacy and academic achievement has been a topic of interest in social sciences researches. Based on past literature, there was a general agreement that self-efficacy was

strongly related to one's academic achievement. For example, in Turner, Chandler and Heffer's (2009), in Kan and Akabs, (2016), assessed the influence of parenting styles, achievement motivation and self-efficacy on college students' academic achievement. The results indicated that self-efficacy was a significant predictor of one's academic achievement. Also, in Lent, Larkin and Brown's research (2016), they also supported that academic self-efficacy was a reliable predictor of one's educational performance. Although the vast majority of the existing literature supported the notion that there was a significant relationship between self-efficacy and academic achievement, there were also few researches that did not support such an argument. In a study conducted by Barling (2010), she found that whether self-efficacy could influence one's academic achievement depended on some external factors, like gender and socio-economic status. After analyzing the data collected, the researchers found that self-efficacy could only successfully predict females' academic achievement while it failed to accurately foresee males' educational performance. Apart from this finding, it was also shown that self-efficacy could only predict the academic achievement of students with higher socio-economic status.

As reflected in the above research findings, it could be seen that there were inconsistencies in contemporary understanding on the relationship between self-efficacy and academic achievement. Even though most of the existing studies supported there was a strong correlation between the two variables, there were still researches arguing the opposite. Therefore, further investigation is required to demonstrate a clearer understanding between the two constructs.

Attribution and Academic Achievement

Students, when given a learning task, refer to several resources to determine how they study the task, how they estimate their success, how much effort and time will they invest on the task. The result of this evaluation process relies on students' cognitions and motivational beliefs. Attribution theory explains how

students interpret their achievements. According to Weiner (2010), a child may attribute test results to several factors, including ability or effort, assistance from the teacher, and the difficulty level of the test. Furthermore, prior research indicates that different attribution patterns have been identified for successful and unsuccessful students (Kivilu & Rogers, 2008; McMillan & Forsyth, 2011). These attributions differ from one another in three primary ways: locus, stability, and controllability (Weiner, 2010). A major study conducted by Eccles, Lord and Midgely (2012) used a range of eight likely reasons for success and failure in mathematics. The sample which comprised of adolescents from 11 to 16 years ranked the relative importance of reasons. Short and long term effort, ability, and teacher's help were the most important reasons for success. Lack of effort and ability, and task difficulty were the most important reasons for failure. In principal, these reasons highlighted the basis of students' attribution style for academic success and failure. Hence, attribution style is a cognitive and personality variable that reflects the manner in which individuals explain the causes for the successes and failures in their lives (Peterson & Seligman, 2014).

Several researchers who have studied academic achievement have reported that one of the most successful predictors of academic achievement has been attribution (Kloosterman, 2014). Although these studies focused on the dimensions of optimism and pessimism in relation to attribution style, they provide a framework for understanding the relationship between attributions and academic performance. Studies by Wilson and Linville (2015) were based on the reasoning that, in the first year of college, students might experience a series of academic setbacks common to the transition from one level of schooling to another, such as more challenging courses and a new social environment. The way in which students explain these academic setbacks is considered crucial. Students who blame their academic difficulties on internal, stable factors are likely to experience anxiety, put forth little effort, and thus have difficulty in learning new material. Dweck (2015) indicated that encouraging students to attribute their poor

performance to unstable causes resulted in both improved effort and performance. She reasoned that students who view their intelligence as a stable trait react to failure very differently from students who view their intelligence as unstable. Therefore, students' understanding of their attribution may help them improve their academic performance. This process can be done through attribution retraining programs. These programs attempt to enhance motivation by altering students' attributions for successes and failures (Schunk, 2011).

2.4 Empirical Studies

This section reviewed empirical studies that are related to the present study as follows:

Relationship between Self-efficacy and Academic Achievement

Adeyemo and Torubeli (2008) investigated self-efficacy, self-concept and peer influence as correlates of academic performance in mathematics and English language among adolescents in transition, Yenagoa metropolis of Bayelsa State. Correlational survey design was adopted. In this study, 300 participants from senior secondary schools in Yenagoa metropolis of Bayelsa were selected using simple random sampling technique. The students responded to three different valid and reliable instruments namely; students' self-efficacy questionnaire developed by Morgan and Jink was used to access the academic self-efficacy of the participants. Adolescents' personal data inventory developed by Akinboye was the self-concept inventory scale used and this measures family, social, biological and educational factors affecting the behaviour of Nigeria Adolescents. Peer influence questionnaire constructed by the researcher was equally used. The three instruments have the reliability of 0.82, 0.87 and 0.76 respectively. The data were analyzed using multiple regression procedure to examine the predicative effect. The findings showed that the three variable gave a coefficient of multiple regression (R of 0.22) multiple R square (R²) of 0.049, Adjusted R square of

0.033. Thus, the analysis showed that the independent variable as a block contributed 3.3 percent to the variance of academic achievement of the students. This study is related to the present study in that they both consider self-efficacy as one of the independent variables and employ the same method of data analysis but differ in subject area, other independent variables and location.

Onyeizugbo (2010) examined self-efficacy and test anxiety as correlates of academic performance among undergraduate students of a university in Eastern Nigeria. The main purpose of this study was to investigate the extent variability in academic performance of the participants is attributable to self-efficacy and test anxiety. Correlational survey design was adopted. 249 (100 male and 149 female) undergraduate students aged 23 to 25 years formed the sample. General Self-efficacy Scale and Westside Test Anxiety Scale were used to assess self-efficacy and test anxiety respectively, whereas average score of students in two psychology degree courses were used to assess their academic performance. Regression analysis as well as Pearson r was used for data analysis. Findings showed a significant positive correlation between self-efficacy and academic performance and a significant negative correlation between test anxiety and academic performance. Also, regression analysis showed a significant model emerged. Self-efficacy significantly predicted the variability in academic performance, and equally, test anxiety proves to be a significant predictor of the variability in academic performance. Given the observed high correlation between self-efficacy and test anxiety in academic performance, the author is concerned that the observed high prevalence of examination fraud in Nigeria may not be unconnected with students' low appraisal of their capability in academic context, and therefore recommends programs that will facilitate gains in self-efficacy as well as confident posture in approaching examinations. This study is related to the present study in that they both consider self-efficacy and test anxiety as two of the independent variables. They also considered gender as well and employed the

same method of data analysis but differ in academic subject, other independent variables and location.

Kaitlyn and Philip (2013) stated that self-efficacy has been shown to be related to sport performance in a significant and reciprocal fashion over one season and across repeated trials. Their study investigated the self-efficacy performance relationship within one continuous (i.e. uninterrupted) sport task. The research employed a descriptive survey. Forty-seven participants had their self-efficacy and performance measured concurrently five times within one educational gymnastic routine. A path of the findings from the analysis revealed that self-efficacy was not a significant predictor of performance, nor was performance a significant predictor of self-efficacy. Previous performance was, however, a significant predictor of subsequent performance, and previous self-efficacy was a significant predictor of subsequent self-efficacy. Although these findings were inconsistent with previous trial-to-trial self-efficacy–performance studies, this may be due to a notion of “overconfidence” developed as a result of the routines created by the participants in an educational gymnastics course. The results further raise an interesting issue of whether the previously established reciprocal self-efficacy–performance relationship remains recursive when tasks vary within one performance. This study is related to the present study in that they consider self-efficacy as one of the independent variables, employ the same design and academic subject but differ in other independent variables and location.

Yazachew (2013) investigated relationship between self-efficacy, academic achievement and gender in analytical chemistry at Debre Markos College of Teacher Education (DMCTE) in Ethiopia. The study employed a descriptive survey design. 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 was 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, and there is no significant difference in their self-efficacy between sexes, but there is a statistically significant difference in achievement between sexes and also a significant relationship exists between self-efficacy and achievement. Based on these findings, it was recommended that Teachers should be responsible to their students to enhance students' self-efficacy. Additional tuition should be provided for female students to increase their achievement and Counselors and educators should give continuous advice and develop techniques that help lower anxiety and reduce stress, to increase students' self-efficacy. This study is related to the present study in that they both consider self-efficacy as one of the independent variables and employ the same method of data analysis. They also considered the same academic subject and gender but differ in other independent variables and location.

Kan and Akbas (2016) determined students' level of attitude and self-efficacy towards chemistry and to put forth effects of these variables on chemistry achievement for consideration (in other words, to determine how the chemistry achievement were predicted by these variables). The study adopted a correlational survey design. The research was conducted with 1000 students studying at the 1st, 2nd and the 3rd grade of 10 high schools which are located in the city center of Mersin. Data was analyzed via descriptive, correlation, linear and multiple regression statistical analyses. Findings revealed that 2nd graders group of high schools has maximum attitude scores and the attitude towards chemistry course, on its own, is a significant predictor of chemistry achievement. It was also determined that 2nd graders group of high schools has maximum self-efficacy scores and the self-efficacy towards chemistry course, on its own, is a significant predictor of chemistry achievement. This study is related to the present study in that they consider self-efficacy as one of the independent variables, employ the

same design and academic subject but differ in other independent variables and location.

Titilayo, Oloyede and Adekunle (2016) investigated how Self-efficacy reflects the extent to which students believe that they can successfully perform in school. It usually positively correlated with outcome expectations but it is possible that a student's high self-efficacy does not transform into a high academic achievement. The study sought to find out the relationship between chemistry students' self-efficacy and their academic achievement in senior secondary schools in North-central, Nigeria. The study is an ex-post facto research and is a descriptive survey. The subjects of the study were one thousand one hundred and fifty (1150) senior secondary school III chemistry students selected from Kogi, Kwara and Niger States of Nigeria. The data collected were analyzed using descriptive and inferential statistics of mean, percentage and Pearson Product Moment Correlation. The findings revealed that no significant relationship existed between self-efficacy and the academic achievement of the chemistry students. The study concludes that students' self-efficacy needs to be complemented with a host of other factors to achieve high academic achievement in Chemistry. It is therefore recommended that attention be paid to other factors necessary for better students' achievement in chemistry to complement students' high self-efficacy, so that a combination of these factors could result in high academic achievement in Chemistry. This study is related to the present study in that they consider self-efficacy as one of the independent variables, employ one of the designs used in the present study and academic subject but differ in other independent variables and location.

Relationship between Attribution and Academic Achievement

Yoau-Chau and Hsin-hua (2008) examined the impact of attribution on Mechanics self-efficacy and the relationships among goal setting, self-efficacy, and Mechanics achievement in Department of Mechanical Engineering students.

Correlational survey design was adopted. Three hundred and forty-five (345) freshmen in a Technology University were used as participants in this two-year longitudinal study. Findings showed that the beneficial attributers possessed higher self-efficacy than individuals with less beneficial attribution. Further, it was shown that Mechanical Engineering students with higher self-efficacy achieved better proficiency level during the consecutive Mechanics proficiency test every half-year. Meanwhile, those with higher self-efficacy are likely to set higher goal level for the subsequent tests, and those with higher goal setting have performed better than those with lower goal setting. Together findings in this study show that the effective way to improve Mechanics performance in Mechanical Engineering students might lie in how to militate the beneficial attribution manners and increase the self-efficacy as well as set higher and reasonable goal level. This study is related to the present study in that they both consider attribution as one of the independent variables and also employed the same design for the study but differ in academic subject, other independent variables and location.

Chuanping Lei (2009) investigated the characteristics of causal attribution of academic achievement, expectancy change and emotional response in college students via a questionnaire survey. It was found that: (1) College students had different attributions on success and failure. Differences among students' grades and that between success and failure were significant while differences between genders were not significant. (2) College students had higher expectation when they came across failure, and they were willing to work hard to make progress. (3) College students would feel gratified and proud after success. They would feel compunctious and depressed after failure. Their emotional responses were stronger when they succeed. This study is related to the present study in that they both consider attribution as one of the independent variables but differ in academic subject, other independent variables and location.

Loredana and Alexandru (2012) carried out a study to examine the relationship between effort attribution, parental behaviour, test anxiety and achievement in sciences. Their main purpose was to explore if the relationship between effort attribution, test anxiety and achievement was moderated by parental behaviour. Students in the last year of secondary school (N=215; 97 boys and 118 girls) completed self-report questionnaires for effort attribution, parental behaviour, and test anxiety. Students' grades in sciences were collected from school registers. Findings indicated that effort attribution and students' autonomy positively predicted achievement in sciences. Students with a high level of parental control reported more worrisome thoughts. However, effort attribution did not predict students' test anxiety. The implications of these findings regarding the necessity of attribution retraining for improving students' achievement and emotions are discussed. This study is related to the present study in that they both consider attribution as one of the independent variables and also used the same research design but differ in academic subject, other independent variables, and location.

Sutantoputri (2012) examined the relationships between cultural factors (ethnicity and religiosity) and dimensions of students' attributions for their success and failure (locus of control, stability, personal control and external control), along with motivational goals (learning, performance approach, performance avoidance, and work avoidance), self-efficacy, intelligence beliefs, and academic performance were examined among Indonesian university students. The sample was 1,006 university students (43.7% male) from 3 public and 2 private universities in Indonesia. From the sample, 73.8% were Native Indonesians, 24.8% Chinese Indonesians, and 1.6% checked the "Other" box and described themselves as Eurasian, Indian descent, or did not give any description. Based on religious beliefs, 65.1% were Muslims, 17.1% were Christians, 10.5% were Catholics, 5.9% were Buddhists, 1.0% were Hindus, and 0.4% described their religious beliefs as "Other". There were fewer than 3% of Chinese

Indonesian students at the public universities; the first contained 96.6% Native Indonesian and 2.7% Chinese Indonesian students; the second 96.7% Native Indonesians and 2.0% Chinese Indonesians; the third 97.2% Native Indonesians and 1.6% Chinese Indonesians. At the private universities, the proportion of Native Indonesians exceeded that for Chinese Indonesians at public universities: The first private university had 74.2% Chinese Indonesians and 24.0% Native Indonesians; the second 67.8% Chinese Indonesians and 28.7% Native Indonesians. Multiple linear regression was used for analysis. Students' stability attributions predicted their learning goals, whereas neither locus of control, personal, or external control attributions predicted any motivational goals. Self-efficacy predicted learning and performance approach goals, as well as performance avoidance goals. Students' intelligence beliefs did not show significant predictions. Ethnic importance predicted performance approach goals; whilst intrinsic religiosity predicted learning goals. This study is related to the present study in that they both consider attribution as one of the independent variables but differ in academic subject, method of data analysis, other independent variables and location.

Mkumbo and Amani (2012) examined the applicability of the attribution theory in understanding how students attribute their academic success and failure. Participants involved a sample of 260 undergraduate students at the University of Dares Salaam, Tanzania. To enroll participants into the study, an advertisement was posted on University notice boards requesting for volunteers to complete a questionnaire in which 260 students responded. These came from various colleges and schools, with a majority of them coming from the College of Arts and Social Sciences (CASS, 33.1%), College of Engineering and Technology (COET, 18.1%), University of Dares Salaam Business School (UDBS, 16.9%) and College of Natural and Applied Sciences (CONAS, 12.3%). The participant distribution largely reflected the student population at the University of Dares Salaam, whereby CASS has the largest student population, with 4416 students (42.3%),

followed by UDBS with 1776 students (17%), COET with 1678 students (16%) and CONAS with 1061 students (10.2%).

All other colleges and schools have less than 10 percent of the student population at UDSM. A majority of participants (50.4%) were in their third year of study, followed by second year (41.5%) and finally those in their fourth year of study (8.1%). They completed an attitude questionnaire scale with items on locus of control, stability and controllability dimensions. The findings show that the majority of students attributed their academic performance to internal, stable and controllable factors. High performing students were more likely to attribute their academic performance to internal and controllable factors than low performing students. Success was attributed to internal and controllable factors, while academic failure was attributed to external and uncontrollable factors. Save for sex, the participants' demographic variables did not statistically significantly influence the attribution pattern. The findings of this study confirm the predictions of the attribution theory and are in line with the findings of similar studies conducted in other university settings. This study is related to the present study in that they both consider attribution as one of the independent variables but differ in academic subject, method of data analysis, other independent variables and location.

Erkut (2013) explored expectancy and attribution of achievement as related to sex differences in academic performance. Study I investigated expectancy and attribution of achievement, operationalized as grade point index, among 176 male and 116 female college freshmen. Men were found to form higher expectations for future grades. Attributions measured through assigning percentage weights to ability, luck, effort, and difficulty as causal explanations of one's grade point index showed that men make more ability and women more effort attributions. Despite these differences in expectancy and attribution patterns, men and women were found not to differ in their performance. In Study II 120 college freshmen, half of

them male, half female, filled out questionnaires before and after a midterm examination. A subsample of 49 also completed the Bem Sex Role Inventory. The findings corroborated with previous findings, except in Study II, men and women gave equally high weights to effort as a cause. The findings also show that a feminine sex-role orientation is associated with a debilitating pattern of expectancy and attribution and lower performance, especially among women. Implications of the results for unraveling inconsistencies in the attribution literature and for a need to clarify connotations of femininity are discussed. This study is related to the present study in that they both consider attribution as one of the independent variables but differ in academic subject, research design, other independent variables and location.

Azubuikwe (2014) investigated the moderating role of attribution style on relationship between leadership style and perceived risk-taking among bank management staff. One hundred and ninety-four (194) bank management staff comprising 100 males and 94 females drawn from ten commercial banks in Asaba, Delta state participated in the study. Their ages ranged between 26 and 40 years, with a mean age of 33 years. A 45-item Multifactor Leadership Questionnaire (MLQ) (Bass & Avoli, 1999) was used to measure leadership style; Adapted form of Perceived Risk-taking Scale (Weber, Blais & Betz, 2002) was used to measure perceived risk-taking behaviour; and Anderson's (1999) Attribution Scale was used to measure attribution style. The result of the analysis showed that autocratic leadership style was a significant predictor of perceived risk-taking behaviour ($\beta = -.31, t = -3.03, p < .001$). Democratic leadership style was also found to be a significant predictor of perceived risk-taking behavior ($\beta = .29, t = 2.82, p < .001$). Controllability attribution style moderated the relationship between autocratic leadership and perceived risk-taking ($\beta = -.31, t = -2.72, p < .001$). Also, controllability attribution style moderated the relationship between democratic leadership and perceived risk-taking ($\beta = .27, t = 2.57, p < .005$). Globality

attribution style also moderated the relationship of laissez-faire leadership and perceived risk-taking ($\beta = -.26$, $t = -2.49$, $p < .005$). Implications of these findings were highlighted and suggestions made for further studies.

Genet (2014) examined causal attributions by college-age students regarding their academic achievement. A descriptive survey design was employed to measure the existing attribution level of the students. Simple random sampling method was used to select sample departments from each college, and representative samples were selected from each department based on academic rank. The total participants involved in this study were 104 second year students at Mizan-Tepi University in Ethiopia. They completed a multi-attributional causality scale with items related to ability, effort, context and luck dimensions. Means, independent sample t-tests, and one-way analysis of variance (ANOVA) were used for analysis. The findings showed that the majority of students attributed their academic achievement to internal factors. Academic success was attributed to internal factors while academic failure was attributed to external factors. Moreover, high- and medium-achievers tended to attribute their academic achievement to effort and ability while students with low achievement were more likely to assign the causes of academic success and failure to luck. Sex differences revealed that males tended to attribute their academic achievement to ability, whereas for females there was no significant difference in their attribution to effort, context or luck. This study is related to the present study in that they both consider attribution as one of the independent variables but differ in academic subject, other independent variables, design of study and location.

Okonkwo (2015) investigated attribution style as correlates of student's academic achievement in chemistry. It was a survey research design with three research questions and two null hypotheses guiding the study. Chemistry achievement test (CAT) and a questionnaire on attribution style (QAS) used for data collection were validated. Kuder-Richardson formula (K-R21) was used in

determining the reliability of the instruments. 1239 students were randomly selected from a population of 2467 senior secondary schools in six education zones in Anambra state. Pearson product moment correlation was used to analyze the data. Findings indicates that students do not believe in achieving success through effort /ability (internal attribution style) rather they believe in external forces such as teachers, luck, miracle centres and external others for their academic pursuit. Encouraging students to be attributing their success or failure to internal factors rather than externals because internal attribution increases student's effort in their academic achievement was recommended. This study is related to the present study in that they both consider attribution as one of the independent variables and dependent variable but differ in academic subject, other independent variables and location.

Sukariyah and Assaad (2015) explored the effect of attribution retraining on high school students' academic performance in mathematics. The purpose of the study was to modify students' attributions regarding their achievement in mathematics and to teach them adaptive styles of attributions. Sixty-seven students from grades 10 and 11 conducted the Attribution Questionnaire as a pre-test. Twenty-two students were chosen for the experimental group based on their low score on the questionnaire. The control group which had been selected from the other 45 students was formed by matching their results in mathematics with that of the experimental group. Both the experimental and control groups were equal in number ($n=22$). The study used a pretest-posttest control group design with matching. Although, random assignment of subjects to experimental and control groups was not performed, the research design is a form of quasi-experimental one. The findings demonstrated the positive effect of attribution retraining on students' academic achievement in mathematics and their attribution styles. In adopting adaptive attributions, students in the experimental group were able to view their success as a result of effort and ability rather than luck and task difficulty. It is recommended that the training applied in this research be

implemented in developmental guidance programs. This study is related to the present study in that they consider attribution as one of the independent variables but differ in academic subject, other independent variables, research design and location.

Previous research into the relationship between attributions and academic performance has produced contradictory findings that have not been resolved. The present research (Houston, 2016) examined the role of specific dimensions of attributional style in predicting subsequent academic performance in a sample of 979, 11th grade students drawn from ten secondary schools that spanned the full ability range from part of an Education Authority in the South East of the United Kingdom. Four of the schools were known to have a strong record of academic performance. These were two private schools and two grammar schools that select high-ability pupils based on an Education Authority exam at the age of 11, from both high- and low-achieving schools. Hierarchical regression and moderation analyses indicate that internal, stable, and global, attributional styles for positive events predict higher levels of academic performance. Global attributions for negative events were related to poorer performance across all schools. Stable attributions for negative events were related to higher levels of performance in high-achieving schools but not in low-achieving schools. Higher levels of internality for negative events were associated with higher performance only in low achieving schools. This study is related to the present study in that they both consider attribution as one of the independent variables but differ in academic subject, research design, other independent variables and location.

Relationship between Test Anxiety and Academic Achievement

A research on anxiety and school performance was carried out by the Department of Pediatrics of Catania University – Italy in 2014, as cited by Mazzone, Ducci, Scoto, Passaniti, D'Arrigo and Vitiello (2007). The department did a study on Anxiety Test Performance on 478 children and adolescents (age 8

-16 years) who were from predominantly middle-class urban backgrounds. They studied the prevalence and relationship between anxiety and school performance. The children were grouped into three: elementary (ages 8-10yrs) - N=131, middle (ages 11-13yrs) – N= 267, and high school (ages 14-16 yrs) - N= 80 for the purpose of the study. The children completed the Multidimensional Anxiety Scale for Children (MASC). T- Scores were computed for the frequencies returned. An analysis of the results demonstrated an average of 65% or above presence of anxiety. This score was above normal anxiety symptoms were relatively common among children and adolescents and could interfere with normal functioning. They further showed that the prevalence of abnormally high self-reported levels of anxiety increased in frequency with age and was negatively associated with school performance. This study is related to the present study in that they both consider test anxiety as one of the independent variables but differ in academic subject, other independent variables and location.

Muola, Kithuka, Ndirangu and Nassiuma (2009) carried out a study on the relationship between test anxiety and academic performance in secondary schools in Nyeri district, Kenya. They used a correlational survey design and selected their research participants from among form 4 students and their teachers. 83,000 students and 600 teachers formed the target population. The findings showed that there was no significant relationship between test anxiety and academic performance. Their findings also indicated that there was a statistically significant difference between the levels of anxiety aroused by different subjects. They further found out that both boys and girls are equally affected by test anxiety. This study is related to the present study in that they both consider test anxiety as one of the independent variables, employed the same research design but differ in academic subject, other independent variables and location.

Rizwan and Nasir (2010) investigated the relationship between test anxiety and academic achievement in mathematics. The major aim of this research study was to explore the relationship between test anxiety and academic achievement of

students at the post graduate level. The study is a correlational survey research. A sample of 414 students was randomly selected from seven different science departments in a public sector university in Lahore, Pakistan. Data were collected by using the Test Anxiety Inventory (TAI) developed by Spielberger. Pearson correlation, multivariate statistics and regression analyses were run for data analysis. It was found that a significant negative relationship exists between test anxiety scores and students' achievement scores. Findings showed that a cognitive factor (worry) contributes more in test anxiety than affective factors (emotional). Therefore, it is concluded that test anxiety is one of the factors which are responsible for students' underachievement and low performance but it can be managed by appropriate training of students in dealing with factors causing test anxiety. This study is related to the present study in that they both consider test anxiety and as one of the independent variables but differ in subject area, other independent variables and location.

Grills-Taquechel, Fletcher, Vaughn and Stuebing (2012) conducted a quantitative, non-experimental study to determine the relationship between reading difficulties and anxiety in students. The researchers analyzed the anxiety levels and achievement test scores of 153 average or at-risk general education first grade students. Students completed the Multidimensional Anxiety Scale for Children. Students who had lower reading scores at the beginning of the study tended to decrease their harm avoidance tendencies at the end. A decrease in harm avoidance tendencies means the students were not as concerned with reading correctly. Those same students tended to increase their separation anxiety tendencies at the end of the study. The students did not necessarily worry about their reading skills, but they were more likely to avoid going to school. When using anxiety at the beginning of the study as a predictor of fluency at the end of the study, researchers found that students with higher levels of harm avoidance at the beginning of the study showed increases in reading skills at the end of the study. This trend was more evident in girls than boys. Anxiety turned out to be a

motivating influence for some students. This study is related to the present study in that they consider test anxiety as one of the independent variables but differ in academic subject, research design, other independent variables and location.

Nadeem, Ali, Maqbool and Zaidi (2012) studied the impact of anxiety on the Academic Achievement of Students at University level in Bahawalpur, Pakistan. Being a descriptive study, survey method was adopted for data collection to find out the results. For sample size out of 200 students 97 students were selected by stratified sampling. The researcher made three groups of all the students and three groups of male and female students. In this research questionnaire (Otis self-administering test of mental ability) and anxiety measurement scale was selected as an instrument for the purpose of data collection. Data was analyzed by using the formula of regression to see the impact of anxiety on the academic achievements of students and formula of co-relation was applied to see the relationship of anxiety and academic achievements of students in SPSS software. The in depth investigation of the findings obtained through this analyzed data reveals that anxiety had its impact on academic achievement of students. The findings showed that when anxiety increases, academic achievement decreases both in male and female students. This study is related to the present study in that they both consider test anxiety as one of the independent variables and research design but differ in academic subject, other independent variables and location.

Barrows, Dunn and Lloyd (2013) examined how student's level of self-efficacy and test anxiety directly impacts their academic success. Specifically, how test anxiety and level of self-efficacy directly preceding an exam will affect the exam score. The study is an experimental design. Pre-and post-questionnaires assessing anxiety and self-efficacy immediately before and after a single college exam was completed by 110 college students and exam grades were obtained from the instructor. Findings showed a strong relationship between both test anxiety and exam grades, and self-efficacy and exam grades. Further, multiple linear

regression analyses showed that exam grade could be predicted by test anxiety and self-efficacy level, and that self-efficacy moderated the effects of anxiety. This study is related to the present study in that they both consider test anxiety and self-efficacy as two of the independent variables but differ in academic subject, other independent variables and location.

Tehrani, Majd and Ghamari (2014) compared the self-efficacy, test anxiety and competitiveness in top private¹ and public² high schools students by using Ex Post Facto Research. The sample population consisted of 338 second grade math and physics high school students (172 males and 166 females) in Tehran, who were selected through Multi-stage cluster sampling. To measure the self-efficacy, it was used, Self-efficacy questionnaire for children (Muris, 2011), to measure the test anxiety, it was used, Test anxiety inventory (Tai, 1992) and to measure the competitiveness it was used, Winning, mastery and performance questionnaire (Franken, 1994). The findings showed that general self-efficacy, test anxiety and competitiveness were higher in TPS students (emotional and academic self-efficacy were higher and there was no significant difference for social self-efficacy). Compare to boys and girls, in terms of competitiveness and self-efficacy; boys earn higher scores and in test anxiety girls had higher grades (in terms of academic and social self-efficacy, there were no significant differences between them but in emotional self-efficacy boys were at a higher level). It can be said that both strategies and management practices were efficient in self-efficacy, test anxiety and competitiveness of students and also the students are attracted to these schools that have these features more. This study is related to the present study in that they both consider test anxiety and self-efficacy as two of the independent variables but differ in subject area, research design, other independent variables and location.

Syokwaa, Aloka and Ndunge (2014) investigated the relationship between anxiety levels and academic achievement among students in selected secondary schools in Lang'ata district, Kenya. The study adopted an ex-post facto design and

the sample size comprised 180 secondary school students (90 boys and 90 girls). A personality anxiety self-examination quiz and an anxiety test examination were administered to participants. Data was analyzed by using both descriptive and inferential statistics. The findings showed a presence of high personality anxiety levels at 79%, while the test anxiety indicated a relatively low-normal anxiety level of 27%. The study found out that, there was a correlation between anxiety levels and academic achievement, and that high anxiety levels had a negative impact on the quality of academic results recorded by students. The study also established that students' encountered some high anxiety causing challenges which affect their ability to perform effectively, and girls were found to be more prone to high anxiety levels as compared to boys. The study recommended that, students should take responsibility to seek for anxiety management help from teacher counselors, other teachers. This study is related to the present study in that they both consider test anxiety as one of the independent variables but differ in academic subject, research design, other independent variables and location.

Melanie, Shannon, David (2017) carried out a quantitative study, a total of $n = 761$ students (58.1% female) from selected fifth- and sixth-grade mathematics classrooms in Alabama were surveyed in order to investigate the relationships between self-regulated learning, motivation, anxiety, attributions and achievement in mathematics. Data analyses revealed that significant contributions are made by motivation and anxiety on both test score and mathematics grade for fifth grade students. Specific factors (e.g., self-efficacy, worry, other, and failure) were related to academic performance while failure attribution was significantly related to mathematics grade. As for sixth grade students, data analyses showed relationships exist between motivation, anxiety and academic performance with specific factors (i.e., self-efficacy, intrinsic value, and worry) significantly predicting both test score and mathematics grade for sixth graders. The findings underline the importance of motivation and anxiety for students and how these constructs interact to facilitate self-regulation over the course of developing

expertise in a domain, such as mathematics. This study is related to the present study in that they both consider test anxiety as one of the independent variables but differ in academic subject, research design, other independent variables and location.

Summary of Review of Related Literature

This chapter reviewed related literature based on conceptual framework, theoretical framework, theoretical studies and empirical studies. The conceptual issues raised in the study found proper definitions and orientations in literature. However, it was clear enough from the literature that a unified concept of the constructs under study exist. Literature reviewed in this study showed that the theoretical framework upon which this study was based is in agreement with such widely accepted theories of learning like Bandura's social cognitive theory, Heider's attribution theory and Mandler and Sarason test anxiety theory. The period in secondary school is usually the period of transition in one's life. During this period of transition, adolescents exhibit maladaptive behaviour which hampers their academic achievement. At the same time, people attribute their life to one thing or the other. In the same vain at this same age of life there are tendencies to have anxiety in test and examinations. Literature further revealed that many of these acts are manifestations of low self-efficacy, external attribution and anxiety. Self-efficacy, attribution style, test anxiety and their interactions to enhance learning and achievement abound in literature. Review of empirical studies showed that two designs were predominantly used in studies conducted on the relationship between self-efficacy, attribution style, test anxiety and academic achievement. Quite a number of studies rather adopted the correlation survey design in assessing the relationship between the academic achievement and personality variables in a particular school subject.

In spite of efforts by researchers in determining the relationship between academic achievement and personality variables in literature, there are still

consistent poor academic achievements of students in Chemistry. Efforts have been made by educational researchers to improve students' academic achievement especially in chemistry but adequate attention has not been paid to the affective components of learners such as perceived self-efficacy, attribution style and test anxiety. However, self-efficacy, attribution style and test anxiety as correlates of Chemistry achievement have not been investigated. Therefore, the present study intends to close the gap in knowledge by determining the extent of relationship between self-efficacy, attribution style, test anxiety and their contributions to academic achievement in Chemistry among secondary school students in Imo State.

CHAPTER THREE

METHODS

This chapter deals with the method used to carry out the investigation. It covers research design, area of the study, population of the study, sample and sampling technique, instrument for data collection, validation of instrument, reliability of instrument, method of data collection and method of data analysis.

3.1 Research Design

The study employed a predictive correlational research design. This design was used due to its appropriateness in the measurement of two or more variables and the relationship between or among those variables (Stangor, 2011). Further, the design was suitable for the study because the researcher was interested in predicting the outcome of chemistry achievement using certain variables (academic self-efficacy, attribution styles and test anxiety) as predictors. Other features that made the design useful for this study are: that it involves the measurement of variance on the outcome variable relative to variance on the predictor variable(s), there was no manipulation of the variables or subjects under study; the study was conducted in the subjects' natural environment, that is, on a normal school day, with no pre-preparations and achievement was measured using the normal students' evaluation tests. It was presumed that the outcome variable was determined to some extent by the predictor variables thus the study drew conclusions based on the predictive levels of each of the predictor variables on the outcome variable (Creswell, 2012). In this case, the link among students' academic self-efficacy, attribution styles, test anxiety and chemistry achievement was investigated.

3.2 Area of the Study

The study was carried out in Imo State. Imo State is one of the 36 states of Nigerian that came into existence on February 3, 1976 under the military leadership

of late Murtala Muhammad. Before 1976, the area called Imo state now used to be part of east Central State of Nigeria. Imo State lies in the south eastern part of Nigeria with Owerri as its capital and largest city. The State is named after the Imo River. The main cities in Imo State now are, Owerri, Orlu and Okigwe. The Orashi River has its source in this state. The local language is Igbo and Christianity is the predominant religion. Imo State lies within latitudes 40°N and 70°N , and longitude 60°E and 70°E with an area of around 5,100sq km. It is bordered by Abia State on the east, River Niger to the south, and Delta State on the West, Anambra State to the north and Rivers State to the south. The state is rich in natural resources including crude oil, natural gas, lead and zinc. Economically exploitable flora like the mahogany, obecha, bamboo, rubber tree and oil palm predominate. Imo State consists of twenty-seven Local Government Areas. Education is of high priority in the state. There are approximately 2,040 primary schools, 295 public secondary schools, 75 private secondary schools, four technical colleges and 65 approved private vocational/commercial secondary colleges in Imo State. Secondary schools in Imo State are zoned based on Local Government Area. There are six educational zones, namely Orlu zone I & II, Owerri zone I & II and Okigwe zone I & II.

3.3 Population of the Study

The population of this study comprised all 16,302 senior secondary class two (S.S.2) Chemistry students in 295 public secondary schools in all the six education zones in Imo State in 2018/2019 academic session. The population distribution by education zones and gender is shown as Appendix B on page 109.

3.4 Sample and Sampling Techniques

The sample size for this study is 875 from 35 schools. Three types of sampling procedures were used: purposeful, proportionate and simple random sampling. Purposeful sampling was used to select three education zones (Owerri zone I, Okigwe zone II and Orlu zone I) because of the reported poor chemistry

achievement. Proportionate random sampling was used to draw 15 schools from Owerri education zone I, 7 schools from Okigwe education zone II and 13 schools from Orlu education zone I. This is because the population of schools in these zones differs. Simple random sampling was further used to select the students who participated in the study. The sample by education zones, schools and gender distribution is presented as Appendix E in page 112.

3.5 Instrument for Data Collection

Four instruments were used to collect data for this study. These instruments are described below:

Students Self-Efficacy Scale: The Morgan-Jinks Student Self-Efficacy Scale (MJSES) 1999 developed by Morgan and Jink was used to assess the academic self-efficacy of the students. The instrument has a total of 30 items on a four scale response format: really disagree (4), kind of agree (3), kind of disagree (2) and really agree (1). The Morgan-Jinks Student Efficacy Scale was adapted for this study in terms of language modification (such as items 3, 11, 18, 19, 22 and 30), in order to gain information about student efficacy beliefs relative to school success. The adaption of the instrument was to ensure it covers the school subject under study (Appendix F, page 114).

Attribution Scale for Students: The Attribution Scale for Students (ASS) developed by Shumow and Schmidt (2013) was used to measure the attribution level of the students. It has 22 items on a four scale response format ranging from Usually (U) = 4; Sometimes (S) = 3; Rarely (R) = 2 and Never = 1. ASS was adapted for this study and was done to reflect appropriate secondary school students' attribution (such items as 3, 16 and 19) (Appendix G, page 115).

Test Anxiety Scale: The Sokan Test Anxiety Scale (STAS) developed by Sokan (1998) was adapted to measure the test anxiety level of the students. This was done in terms of language modification (such items as 2, 9, 14, 17 and 20). The

STAS is a 25-item instrument measuring test anxiety expressed with statements concerned with one's feelings toward test of examination. A high index of score (25-34) suggests anxiety disorder while a low index (35-100) suggests the reverse (Appendix H page 116).

Academic Achievement Records

Chemistry achievement records of the participants were obtained from school term examinations records. The cumulative mean scores in chemistry at the end of three terms in SS II (2017/2018 academic session) were obtained. This was used as a measure of students' academic achievement. The examination taken by students in Imo State are moderated by State Ministry of Education, hence the result from the termly examinations are standard and uniform.

3.6 Validation of the Instruments

The Morgan-Jinks Student Self-Efficacy Scale, Attribution Scale and Text Anxiety Scale were subjected to face validation. This was done by three experts: one in Measurement and Evaluation and one in Science Education from the Faculty of Education, Nnamdi Azikiwe University, Awka while the third is from Alvan Ikoku Federal College of Education Owerri. The validators' reports are attached as Appendix L on page 181.

3.7 Reliability of the Instruments

The reliability of the instruments was established using trial-testing method and Cronbach Alpha technique. Cronbach Alpha was used because the items in the instruments have multiple ratings. The instruments were administered on 20 secondary school students from Okpuala-Umugwor Community School, Okpuala-Umugwor Osioma, Abia State which was outside the area of the study. The reliability coefficient for MJSSES, ASS and STAS yielded 0.81, 0.71 and 0.78 respectively, Appendix I on pages 117.

3.8 Method of Data Collection

The researcher first visited the schools and discussed with the principals to get permission to carry out the research. The instruments were administered on the students by the researcher with the help of five research assistants to facilitate easy administration of the instruments. A total of 875 copies of the instruments were administered, while 869 were returned. This gave a return rate of 99.3%.

3.9 Method of Data Analysis

The data collected were analyzed using regression analysis, frequency count and percentage with aid of statistical package for Social Sciences (SPSS) version 20. Multiple and simple linear regression analysis were used to test the null hypotheses at 0.05 alpha level. Multiple regression takes into account the effect of multiple independent variables on a dependent variable and determines the quantitative relationships between them. The norm for self-efficacy scale is: low academic self-efficacy (30-59), high academic self-efficacy (60-84) and very high academic self-efficacy (85-120). For attribution styles, the following range of scores was adopted as the norm: not attributed to student (6-14), attributed to student (15-24), not attributed to teacher (2-4), attributed to teacher (5-8), not attributed to luck (2-4), attributed to luck (5-8). For test anxiety, the Nigeria norm indicates that (25-34) shows absence of test anxiety, while (35-100) shows presence of test anxiety. For academic achievement: Below Average (0-44), Average (45-59) and Above Average (60-100). When P-value (Sig.) is less than 0.05, the null hypothesis is rejected otherwise the null hypothesis is not rejected.

CHAPTER FOUR

RESULT AND DISCUSSION

This chapter presents the summary of analysis of data for the study. The results of the data analysis are presented according to the research questions and hypotheses that guided the study.

Research Question 1

What is the self-efficacy score of secondary school chemistry students in Imo state?

Table 1: Self-efficacy scores of secondary school chemistry students

Range of score	N	%	Remark
30-59	0	0	Low Academic Self-efficacy
60-84	587	67.5	High Academic Self-efficacy
85-120	282	32.5	Very High Academic Self-efficacy

Table 1 shows that 282 (32.5%) of the students who scored 85 and above have very high academic self-efficacy, 587 (67.5%) of them who scored between 60 and 84 have high academic self-efficacy while no student had low academic self-efficacy.

Research Question 2

What is the attribution style scores of secondary school chemistry students in Imo state?

Table 2a: Success Attribution scores of secondary school chemistry students, Teacher and Luck

Attribution Styles			
Variables	Range of scores	N (%)	Remarks
Student	6-4	191(22)	Not attributed to students
	15-24	678 (78)	Attributed to students
Teacher	2-4	620 (71.3)	Not attributed to teacher
	5-8	249 (28.7)	Attributed to teacher
Luck	2-4	278 (32)	Not attributed to luck
	5-8	591 (68)	Attributed to luck

Note. N = 869; () = % of the total.

Table 2a shows that 678(78%) of the students who scored between 15 to 24 attributed their success to self-effort, 249(28.7%) who scored between 5 to 8 attributed their success to teacher while 591(68%) who scored between 5 and 8 attributed their success to luck.

Table 2b: Failure Attribution scores of secondary school chemistry students, Teacher and Luck

Attribution Styles			
Variables	Range of scores	N (%)	Remarks
Student	6-4	396(45.6)	Not attributed to students
	15-24	473(54.4)	Attributed to students
Teacher	2-9	435(50.1)	Not attributed to teacher
	10-16	434(49.9)	Attributed to teacher
Luck	2-4	593 (68.2)	Not attributed to luck
	5-8	276 (31.8)	Attributed to luck

Note. N = 869; () = % of the total.

Table 2b shows that 473(54.4%) of the students who scored between 15 to 24 attributed their failure to self-effort, 434(49.9%) who scored between 10 to 16 attributed their failure to teacher while 276 (31.8%) who scored between 5 and 8 attributed their failure to luck.

Research Question 3

What is the test anxiety score of secondary school chemistry students in Imo state?

Table 3: Test anxiety score of secondary school chemistry students

Range of score	N	%	Remark
25-34	0	0	Absence of test anxiety
35-100	869	100	Presence of test anxiety

Table 3 shows test anxiety score of secondary school chemistry students in the study area. The result reveals that all the students 869 (100%) scored between 41-86 in the test anxiety scale, indicating the presence of text anxiety. Therefore, most students are anxious about chemistry achievement test.

Research Question 4

What are the achievement scores of secondary school students in chemistry in Imo state?

Table 4: Description of chemistry achievement

Level of Achievement (%)	Frequency	Percent (%)	Remarks
70-100	92	10.6	Excellent
60-69	200	23.0	Very Good
50-59	223	25.7	Good
45-49	187	21.5	Pass
0-44	167	19.2	Fail
Total	869	100	

Results in Table 4 show that the 167 (19.2%) of the students failed in chemistry, 187 (21.5%) of the students had a pass score in chemistry, 223 (25.7%) of the students had good score, 200 (23%) students has very good score while 92 (10.6%) of the students had an excellent score. This result indicates that secondary school students have an average achievement score in chemistry.

Research Question 5

To what extent does self-efficacy scores of secondary school students predicts their chemistry achievement score?

Table 5: Predictive Value for Self-efficacy and Chemistry Achievement

Variables	N	R	R²	Predictive value (%)
Self-efficacy	869	.020	.0004	0.04
Chemistry Achievement	869			

Table 5 reveals that academic self-efficacy had positive linear relationships with chemistry achievement given by $R = .02$. From the analysis, academic self-efficacy belief contributed just 0.04% of variance in chemistry achievement ($R^2 = .04$). The implication of this is that high self-efficacy belief would lead to little increase in students' chemistry achievement.

Research Question 6

To what extent does attribution style scores of secondary school students predicts their chemistry achievement scores?

Table 6A: Predictive Value for Success Attribution style on Chemistry Achievement

Attribution of Success				
Attribution	N	R	R²	Predictive value
Styles				(%)
Self-effort	869	-.168	.028	2.8
Luck	869	.211	.045	4.5
Teacher	869	.285	.081	8.1

Results presented in Table 6a show that self-effort with ($R = -.168$) is a negative predictor of chemistry achievement and contributed just 2.8% of variance in chemistry achievement ($R^2 = .028$). The implication of this is that the more students attribute their success to self-effort, the more they achieve poorly. Also, the results indicate that luck attribution style with ($R = .211$) is a positive predictor of chemistry achievement and contributed 4.5% of variance in chemistry achievement ($R^2 = .045$); implying that the more students attribute their success to luck, the less they achieve poorly. More so, the results show that attributing success to teacher is positive predictor of chemistry achievement and accounted 8.1% of variance in chemistry achievement ($R = .285$; $R^2 = .081$).

Table 6B: Predictive Value for Failure Attribution style on Chemistry Achievement

Attribution of Failure				
Attribution	N	R	R²	Predictive value
Styles				(%)
Self-effort	869	-.259	.067	6.7
Luck	869	.020	.0004	0.04
Teacher	869	.003	.000009	0.0009

Results presented in Table 6b shows that self-effort is a negative predictor of chemistry achievement and contributed 6.7% of variance in chemistry achievement ($R = -.259$; $R^2 = .067$), attributing failure to luck is a positive predictor and contributed 0.04% ($R = .020$; $R^2 = .0004$) while attributing failure to teacher and contributed 0.0009% of variance in chemistry achievement ($R = -.003$; $R^2 = .000009$).

Research Question 7

To what extent does test anxiety scores of secondary school students predicts their chemistry achievement scores?

Table 7: Predictive Value for Test Anxiety and Chemistry Achievement

Variables	N	R	R^2	Predictive value (%)
Test Anxiety	869	.034	.0012	0.12
Chemistry Achievement	869			

Table 7 shows that academic test anxiety had positive linear relationships with chemistry achievement given by $R = .034$. From the analysis, test anxiety contributed just 0.12% of variance in chemistry achievement ($R^2 = .0012$). The implication of this is that the more anxious the students are about chemistry test, the less they achieve poorly.

Research Question 8

To what extent does self-efficacy scores of secondary school male students predicts their chemistry achievement scores?

Table 8: Predictive Value for Self-efficacy and Chemistry Achievement of Male Students

Variables	N	R	R²	Predictive value (%)
Self-efficacy	418	.036	.0013	0.13
Chemistry Achievement	418			

Table 8 reveals that academic self-efficacy had positive linear relationships with chemistry achievement of male students ($R = .036$). From the analysis, academic self-efficacy belief contributed just 0.13% of variance in chemistry achievement ($R^2 = .013$). The implication of this is that high self-efficacy belief would lead to little increase in male students' chemistry achievement.

Research Question 9

To what extent does attribution style scores of secondary school male students predict their chemistry achievement scores?

Table 9A: Predictive Value for Success Attribution scores on Chemistry Achievement of Male Students

Attribution of Success				
Attribution Styles	N	R	R²	Predictive value (%)
Self-effort	418	-.075	.0056	0.56
Luck	418	.068	.0046	0.46
Teacher	418	.214	.0457	4.57

Results presented in Table 9a show that self-effort with ($R = -.075$) is a negative predictor of chemistry achievement of male students and contributed just 0.56% of variance in chemistry achievement ($R^2 = .0056$). The implication of this is that the more male students attribute their success to self-effort, the more they achieve poorly. Also, the results indicate that luck attribution style with ($R = .068$)

is a positive predictor of male students' chemistry achievement and contributed 0.46% of variance in their chemistry achievement ($R^2 = .0046$); implying that the more male students attribute their success to luck, the less they achieve poorly. More so, the results show that attributing success to teacher is positive predictor of male students' chemistry achievement and accounted 4.57% of variance in their chemistry achievement ($R = .214$; $R^2 = .0457$).

Table 9B: Predictive Value for Failure Attribution on Chemistry Achievement of Male Students

Attribution Styles	Attribution of Failure			
	N	R	R^2	Predictive value (%)
Self-effort	418	-.265	.070	7.0
Luck	418	-.005	.000025	0.0025
Teacher	418	-.075	.0056	0.56

Table 9b shows that self-effort is a negative predictor of male students' chemistry achievement and contributed 7% of variance in their chemistry achievement ($R = -.265$; $R^2 = .070$), attributing failure to luck is a negative predictor and contributed 0.0025% ($R = -.005$; $R^2 = .000025$) while attributing failure to teacher and contributed 0.56% of variance in chemistry achievement of male students ($R = -.075$; $R^2 = .0056$).

Research Question 10

To what extent does test anxiety scores of secondary school male students predicts their chemistry achievement scores?

Table 10: Predictive Value for Test Anxiety and Chemistry Achievement of Male Students

Variables	N	R	R²	Predictive value (%)
Test Anxiety	418	.024	.000057	0.0057
Chemistry Achievement	418			

Table 10 shows that academic test anxiety had positive linear relationships with male students' chemistry achievement given by $R = .024$. From the analysis, test anxiety contributed just 0.06% of variance in their chemistry achievement ($R^2 = .000057$). The implication of this is that the more anxious the male students are about chemistry test, the less they achieve poorly.

Research Question 11

To what extent does self-efficacy scores of secondary school female students predicts their chemistry achievement scores?

Table 11: Predictive Value for Self-efficacy and Chemistry Achievement of Female Students

Variables	N	R	R²	Predictive value (%)
Self-efficacy	451	.004	.000016	0.0016
Chemistry Achievement	451			

Table 11 reveals that academic self-efficacy had positive linear relationships with chemistry achievement of female students ($R = .004$). From the analysis, academic self-efficacy belief contributed just 0.0016% of variance in chemistry achievement ($R^2 = .000016$). The implication of this is that high self-efficacy belief would lead to little increase in female students' chemistry achievement.

Research Question 12

To what extent does attribution style scores of secondary school female students predicts their chemistry achievement scores?

Table 12A: Predictive value for Success Attribution on Chemistry Achievement of Female Students

Attribution of Success				
Attribution Styles	N	R	R²	Predictive value (%)
Self-effort	451	-.274	.075	7.5
Luck	451	.368	.135	13.5
Teacher	451	.383	.147	14.7

Results presented in Table 12a show that self-effort with ($R = -.274$) is a negative predictor of chemistry achievement of female students and contributed just 7.5% of variance in chemistry achievement ($R^2 = .075$). The implication of this is that the more female students attribute their success to self-effort, the more they achieve poorly. Also, the results indicate that luck attribution style with ($R = .368$) is a positive predictor of female students' chemistry achievement and contributed 13.5% of variance in their chemistry achievement ($R^2 = .135$); implying that the more female students attribute their success to luck, the less they achieve poorly. More so, the results show that attributing success to teacher is positive predictor of female students' chemistry achievement and accounted 14.7% of variance in their chemistry achievement ($R = .383$; $R^2 = .147$).

Table 12B: Predictive value for Failure Attribution on Chemistry Achievement of Female Students

Attribution Styles	Attribution of Failure			Predictive value (%)
	N	R	R ²	
Self-effort	451	-.293	.086	8.6
Luck	451	.036	.00129	0.129
Teacher	451	.077	.0059	0.59

Results presented in Table 12b shows that self-effort is a negative predictor of female students' chemistry achievement and contributed 8.6% of variance in their chemistry achievement ($R = -.293$; $R^2 = .086$), attributing failure to luck is a positive predictor and contributed 0.129% ($R = .036$; $R^2 = .00129$) while attributing failure to teacher and contributed 0.59% of variance in chemistry achievement of female students ($R = .077$; $R^2 = .0059$).

Research Question 13

To what extent does test anxiety scores of secondary school female students predict their chemistry achievement scores?

Table 13: Predictive Value for Test Anxiety and Chemistry Achievement of Female Students

Variables	N	R	R ²	Predictive value (%)
Test Anxiety	451	.051	.0026	0.26
Chemistry Achievement	451			

Table 13 shows that academic test anxiety had positive linear relationships with female students' chemistry achievement given by $R = .059$. From the analysis, test anxiety contributed just 0.26% of variance in their chemistry achievement ($R^2 = .0026$). The implication of this is that the more anxious the female students are about chemistry test, the less they achieve poorly.

Research Question 14

To what extent do self-efficacy, attribution style and test anxiety scores of secondary school students predict their chemistry achievement scores?

Table 14: Multiple linear regression analysis among the predictor variables

Model	R	R-Square	R ² Adjusted	%
Joint	.134a	.018	-.002	0.2
Chemistry				

a. Predictors: (Constant), Self-efficacy, Attribution style (self-effort, luck, teacher), Test anxiety

Table 18 presents a summary of the multiple regression analysis among the predictor variables when combined together. The result shows that the three variables positively predicted chemistry achievement ($R = .134$). Working together, the three variables accounted for 0.2% of the total variance in chemistry achievement ($AdjR^2 = .002$).

Test of Hypothesis

H₀₁: Self-efficacy scores of secondary school students do not significantly predict their chemistry achievement scores.

Table 15: Significant Prediction of Self-efficacy on Chemistry Achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	62.141	1	62.141	.401	.527
Residual	134318.200	867	154.923		
Total	134380.342	868			

From the result of the regression analysis as shown in Table 15, the statement of null hypothesis 1 is accepted; showing that self-efficacy beliefs of secondary school students do not significantly predict their chemistry

achievement scores. This is because the p-value (Sig. = 0.527) is greater than the 0.05 level of significance.

H₀₂: Attribution style scores of secondary school students do not significantly predict their chemistry achievement scores.

Table 16A: Significant Prediction of Success Attribution on Chemistry Achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	205.493	1	205.493	1.328	.250
Residual	134174.849	867	154.758		
Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), AS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	288.592	1	288.592	1.866	.172
Residual	134091.749	867	154.662		
Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), AL

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	288.592	1	288.592	1.866	.172
Residual	134091.749	867	154.662		
Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), AT

Table 16B: Significant Prediction of Failure Attribution on Chemistry Achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	205.493	1	205.493	1.328	.250
Residual	134174.849	867	154.758		
Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), BS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	194.938	1	194.938	1.260	.262
Residual	134185.404	867	154.770		
Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), BL

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	19.978	1	19.978	.129	.720
Residual	134360.364	867	154.972		
Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT

From the result of the regression analysis as shown in Table 16A and B, the statement of null hypothesis 2 is accepted; showing that attribution styles (self-effort, luck and teacher) scores of secondary school students do not significantly predict their chemistry achievement scores. This is because the p-values are greater than the 0.05 level of significance.

H₀₃: Test anxiety scores of secondary school students do not significantly predict their chemistry achievement scores.

Table 17: Significant Prediction of Test Anxiety on Chemistry Achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	56.135	1	56.135	.362	.547
Residual	134324.207	867	154.930		
Total	134380.342	868			

From the result of the regression analysis as shown in Table 17, the statement of null hypothesis 3 is accepted; showing that test anxiety scores of secondary school students do not significantly predict their chemistry achievement scores. This is because the p-value (Sig. = .547) is greater than the 0.05 level of significance.

H₀₄: Self-efficacy scores of secondary school male students do not significantly predict their chemistry achievement scores.

Table 18: Significant Prediction of Self-efficacy on Chemistry Achievement of Male Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	21.716	1	21.716	.137	.711
Residual	65894.814	416	158.401		
Total	65916.530	417			

From the result of the regression analysis as shown in Table 18, the statement of null hypothesis 4 is accepted; showing that self-efficacy beliefs of secondary school male students do not significantly predict their chemistry achievement scores. This is because the p-value (Sig. = .711) is greater than the 0.05 level of significance.

H₀₅: Attribution style scores of secondary school male students do not significantly predict their chemistry achievement scores.

Table 19A: Significant Prediction of Success Attribution on Chemistry Achievement of Male Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.615	1	4.615	.029	.865
Residual	65911.915	416	158.442		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), AS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.128	1	2.128	.013	.908
Residual	65914.402	416	158.448		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), AL

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.128	1	2.128	.013	.908
Residual	65914.402	416	158.448		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), AT

Table 19B: Significant Prediction of Failure Attribution on Chemistry Achievement of Male Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	4.615	1	4.615	.029	.865
Residual	65911.915	416	158.442		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.214	1	16.214	.102	.749
Residual	65900.315	416	158.414		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BL

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	142.573	1	142.573	.902	.343
Residual	65773.957	416	158.110		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT

From the result of the regression analysis as shown in Table 19A and B, the statement of hypothesis 5 is accepted; showing that attribution styles (self-effort, luck and teacher) scores of secondary school male students do not significantly predict their chemistry achievement scores. This is because the p-values are greater than the 0.05 level of significance.

H₀₆: Test anxiety scores of secondary school male students do not significantly predict their chemistry achievement scores.

Table 20: Significant Prediction of Test Anxiety on Male Students' Chemistry Achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	1.502	1	1.502	.009	.922
Residual	65915.028	416	158.450		
Total	65916.530	417			

From the result of the regression analysis as shown in Table 20, the statement of null hypothesis 6 is accepted; showing that test anxiety scores of secondary school male students do not significantly predict their chemistry achievement scores. This is because the p-value (Sig. = .922) is greater than the 0.05 level of significance.

H₀₇: Self-efficacy scores of secondary school female students do not significantly predict their chemistry achievement scores.

Table 21: Significant Prediction of Self-efficacy on Chemistry Achievement of Female Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	55.723	1	55.723	.375	.540
Residual	66670.539	449	148.487		
Total	66726.262	450			

From the result of the regression analysis as shown in Table 21, the statement of null hypothesis 7 is accepted; showing that self-efficacy beliefs of secondary school female students do not significantly predict their chemistry achievement scores. This is because the p-value (Sig. = .540) is greater than the 0.05 level of significance.

H₀₈: Attribution style scores of secondary school female students do not significantly predict their chemistry achievement scores.

Table 22A: Significant Prediction of Success Attribution on Chemistry Achievement of Female Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	496.569	1	496.569	3.366	.067
Residual	66229.692	449	147.505		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), AS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	649.404	1	649.404	4.413	.086
Residual	66076.858	449	147.164		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), AL

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	649.404	1	649.404	4.413	.086
Residual	66076.858	449	147.164		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), AT

Table 22B: Significant Prediction of Failure Attribution on Chemistry Achievement of Female Students

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	496.569	1	496.569	3.366	.067
Residual	66229.692	449	147.505		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BS

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	446.879	1	446.879	3.027	.083
Residual	66279.383	449	147.616		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BL

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	184.557	1	184.557	1.245	.265
Residual	66541.705	449	148.200		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT

From the result of the regression analysis as shown in Table 22A and B, the statement of null hypothesis 8 is accepted; showing that attribution styles (self-effort, luck and teacher) scores of secondary school female students do not significantly predict their chemistry achievement scores. This is because the p-values are greater than the 0.05 level of significance.

H₀₉: Test anxiety scores of secondary school female students do not significantly predict their chemistry achievement scores.

Table 23: Significant Prediction of Test Anxiety on Female Students' Chemistry Achievement

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	82.662	1	82.662	.557	.456
Residual	66643.600	449	148.427		
Total	66726.262	450			

From the result of the regression analysis as shown in Table 23, the statement of null hypothesis 9 is accepted; showing that test anxiety scores of secondary school female students do not significantly predict their chemistry achievement scores. This is because the p-value (Sig. = .456) is greater than the 0.05 level of significance.

H₁₀: Self-efficacy belief, attribution styles and test anxiety of secondary school students do not significantly predict their chemistry achievement scores.

Table 24: ANOVA for Self-efficacy, Attribution styles and Test anxiety

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2395.615	7	342.231	2.233	.030
Residual	131984.727	861	153.292		
Total	134380.342	868			

From the result of the regression analysis as shown in Table 24, the statement of null hypothesis 10 is rejected; showing that self-efficacy belief, attribution styles (self-effort, luck and teacher) and test anxiety of secondary school students significantly predict their chemistry achievement scores. This is because the p-value is less than the 0.05 level of significance (F = 2.233; Sig. = 0.030, $p < 0.05$).

Discussion of the Findings

Self-Efficacy as a Predictor of Chemistry Achievement

Findings of the study revealed that most of the secondary school chemistry students possessed high academic self-efficacy and they have an average achievement score in chemistry. The findings also showed that academic self-efficacy positively predicted chemistry achievement. This implies that an increase in self-efficacy would lead to increased students' chemistry achievement. From the findings of the regression analysis, the statement of hypothesis 1 is accepted; showing that self-efficacy beliefs of secondary school students do not significantly predict their chemistry achievement. The positive relationship found between self-efficacy and chemistry achievement is not surprising because students with a high sense of efficacy are more likely to challenge themselves with difficult tasks and be intrinsically motivated. These students will invest a high degree of effort in order to meet their commitments. Students with low self-efficacy, on the other hand, believe they cannot be successful and thus are less likely to make a concerted and extended efforts and may consider challenging tasks as threats that are to be avoided. Thus, students with low self-efficacy have low aspirations which may result in low academic achievement.

This result is in agreement with Christensen et al (2012) who found that self-efficacy beliefs are positively related to and influence achievement in accounting. Researchers have reported that mathematics self-efficacy is a good predictor of mathematics interest and choice of mathematics related courses (Lunenburg, 2011). In another study, Onyeizugbo (2010) reported that high self-efficacy seemed to influence academic persistence necessary to maintain high academic achievement. Research findings have suggested that learners who possess' high self-efficacy achieves better in their academic endeavour (Viko, 2010). However, there were also few researches (Kador, 2011; Kaitlyn & Philip, 2013) that did not support such an argument. Kaitlyn and Philip (2013) reported that academic achievement is unpredictable of self-efficacy. This goes to show that

even though self-efficacy related positively with students' achievement in chemistry, the relationship is not significant. This means that one cannot use knowledge of students' self-efficacy to predict what their achievement in chemistry would likely be. This study therefore suggests the need to help secondary school students overcome every problem associated with self-efficacy. Such help and effort, by parents and teachers, will go a long way to increasing students' achievement in chemistry and at the same time help students to belief in their own capability.

Attribution Styles as Predictor of Chemistry Achievement

Findings showed the attribution style scores of secondary school chemistry students. The result revealed that majority of the students attribute both their success and failure to self-effort. Results show that self-effort is a negative predictor of chemistry achievement and contributed little to the variance in chemistry achievement. Also, the results indicate that luck attribution style is a positive predictor of chemistry achievement and contributed little to the variance in chemistry achievement; implying that the more students attribute their success to luck, the less they achieve poorly. More so, the results showed that attributing success to teacher is positive predictor of chemistry achievement and accounted more to the variance in chemistry achievement. The analysis further revealed the predictive values of each of the three domains of attribution styles (to failure) on chemistry achievement. The coefficients for the model showed that self-effort is a negative predictor of chemistry achievement and contributed little to the variance in chemistry achievement, attributing failure to luck is a positive predictor and contributed little while attributing failure to teacher and contributed little or nothing to the variance in chemistry achievement. The implication of this is that the more students attribute their success to self-effort, the more they achieve poorly. From the finding of the regression analysis, the statement of hypothesis 2 is accepted; showing that attribution styles (self-effort, luck and teacher) scores of

secondary school students do not significantly predict their chemistry achievement scores. This is so because attribution is concerned with the thoughts people have about events or situations and what causes them, which offers us one method for understanding human behaviour. Specifically, an attribution is an expression of the way a person perceives the relationship between a cause and an outcome. Students, when given a learning task, refer to several resources to determine how they study the task, how they estimate their success, how much effort and time will they invest on the task. The result of this evaluation process relies on students' cognitions and motivational beliefs.

Several researchers who have studied academic achievement have reported that one of the most successful predictors of academic achievement has been attribution style. Okonkwo (2015) investigated attribution style as correlates of student's academic achievement in chemistry. The result indicates that students do not believe in achieving success through effort /ability rather they believe in external forces such as teachers, luck, miracle centres and others for their academic pursuit. However, encouraging students to be attributing their success or failure to internal factors rather than externals because internal attribution increases student's effort in their academic achievement was recommended. The finding also collaborated with the results of Sukariyah and Assaad (2015) who explored the effect of attribution retraining on high school students' academic performance in mathematics. The results demonstrated the positive effect of attribution retraining on students' academic achievement in mathematics and their attribution styles.

The previous research into the relationship between attributions and academic performance has produced contradictory findings that have not been resolved. This could be as a result of poor and insignificant prediction of attribution styles of students and their chemistry achievement found, which indicates that an increase in attribution style would lead to small increase in students' chemistry achievement. This by implication goes to show that

knowledge of students' attribution styles cannot predict actually what their achievement in chemistry would likely be. However, Dweck (2015) indicated that encouraging students to attribute their poor performance to unstable causes resulted in both improved effort and performance. She reasoned that students who view their intelligence as a stable trait react to failure very differently from students who view their intelligence as unstable. Therefore, students' understanding of their attribution styles may help them improve their academic performance. This process can be done through attribution retraining programs. These programs attempt to enhance motivation by altering students' attributions for successes and failures.

Test Anxiety as a Predictor of Chemistry Achievement

The findings revealed that most students are anxious about chemistry achievement test. It showed that academic test anxiety had positive linear relationships with chemistry achievement. From the analysis, test anxiety contributed very little to the variance in chemistry achievement. The implication of this is that the more anxious the students are about chemistry test, the less they achieve poorly. From the result of the regression analysis, the statement of hypothesis 3 is accepted; showing that test anxiety scores of secondary school students do not significantly predict their chemistry achievement scores. This is surprising because anxiety is a highly unpleasant affective state similar to intense fear which can include feelings of threat, vague objectless fear, a state of uneasiness and tension, and a generalized feeling of apprehension. Individuals experiencing anxiety embody apprehension and avoidant behaviour that often interfere with performance in everyday life as well as in academic situations. Individuals that become highly anxious during tests typically perform more poorly on tests than low-test anxious persons, especially when tests are given under stressful evaluative conditions such as a post-secondary examination.

This result collaborated the result of Muola et al (2009) who carried out a study on the relationship between test anxiety and academic performance in secondary schools in Nyeri district, Kenya. The results showed that there was no significant relationship between test anxiety and academic performance. Their results indicated that there was a statistically significant difference between the levels of anxiety aroused by different subjects. They further found out that both boys and girls are equally affected by test anxiety. Syokwaa et al (2014) found out that, there was a correlation between anxiety levels and academic achievement, and that high anxiety levels had a negative impact on the quality of academic results recorded by students. The study also established that students' encountered some high anxiety causing challenges which affect their ability to perform effectively, and girls were found to be more prone to high anxiety levels as compared to boys. The study recommended that, students should take responsibility to seek for anxiety management help from teacher counselors, other teachers. Rizwan and Nasir (2010) investigated the relationship between test anxiety and academic achievement. It was found that a significant negative relationship exists between test anxiety scores and students' achievement scores. Results showed that a cognitive factor (worry) contributes more in test anxiety than affective factors (emotional). Therefore, test anxiety is one of the factors responsible for students' low performance but it can be managed by appropriate training of students in dealing with the causative factors.

Self-Efficacy, Attribution Style, Test Anxiety and Gender

Findings showed that academic self-efficacy insignificantly predicted both male and female students' chemistry achievement. Attribution styles (self-effort, luck and teacher) insignificantly predicted male and female students' chemistry achievement. Test anxiety insignificantly predicted students' chemistry achievement irrespective of gender. These predictions were not significant as attested to by the regression analysis carried out. This collaborates the earlier

results that these variables related insignificantly with students' achievement in chemistry irrespective of their gender. The study also established that an increase in self-efficacy, attribution styles (luck and teacher) would lead to small increase in students' chemistry achievement while increase in self-effort attribution style would lead to small decrease in students' chemistry achievement irrespective of students' gender. This means that self-efficacy, attribution styles and test anxiety of both male and female students are direct function of their chemistry achievement. However, self-effort attribution style has an inverse relationship with students' achievement in chemistry irrespective of students' gender. Hence, the relationships between self-efficacy, attribution styles, test anxiety and students' chemistry achievement are not gender selective. This is in agreement with previous studies of Muola et al (2009), Rizwan and Nasir (2010), Kaitlyn and Philip (2013) and Syokwaa et al (2014) who found similar results.

Joint Contribution of Self-efficacy, Attribution styles and Test anxiety to the Chemistry Achievement

The findings of this study presents a summary of the multiple regression analysis among the predictor variables when combined together. The result shows that the three variables positively predicted chemistry achievement. Working together, the three variables accounted little to the total variance in chemistry achievement. From the result of the regression analysis, the statement of hypothesis 10 is rejected; showing that self-efficacy belief, attribution styles (self-effort, luck and teacher) and test anxiety of secondary school students significantly predicted their chemistry achievement scores when working together. This is in accordance with Rizwan and Nasir (2010), Kaitlyn and Philip (2013) and Syokwaa et al (2014) who reported similar results earlier. This indicates that other factors are contributing more to students' achievement in chemistry other than their combined self-efficacy, attribution styles and test anxiety. This by implication goes to show that knowledge of students' self-

efficacy, attribution styles and test anxiety cannot jointly predict what their achievement in chemistry would likely be. This is attested to by the beta coefficients of the multiple regression analysis. This suggests the need to help secondary school students overcome every problem associated with these variables. Such help and effort, by parents and teachers, will go a long way to increasing students' achievement in chemistry and at the same time help students to belief in their own capability, attribute their success or failure to internal factors as well as reduce their anxiety level. This is so because academic achievement is a factor found among students and it is a function of many factors, some of which are within the student and the classroom while others are out of the classroom while academic objectives are paramount to students' success in school attainment, goal commitment is sensitive to factors like self-efficacy, attribution styles and test anxiety.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter provides the summary of findings, conclusion and recommendations. Also, implication of the study, limitations and suggestions for further studies are provided.

5.1 Summary of the Findings

1. Most of the students possessed high academic self-efficacy.
2. Majority of the students attributed both their success and failure to self-effort.
3. More than half of the students are anxious about chemistry achievement test.
4. Secondary school students in the study area had an average achievement score in chemistry.
5. Academic self-efficacy positively and insignificantly predicted chemistry achievement.
6. Attribution styles (luck and teacher) positively and insignificantly predicted chemistry achievement.
7. Test anxiety positively and insignificantly predicted chemistry achievement.
8. Self-effort attribution style is an insignificant negative predictor of chemistry achievement.
9. Academic self-efficacy insignificantly predicted male students' chemistry achievement.
10. Attribution styles (self-effort, luck and teacher) insignificantly predicted male students' chemistry achievement.
11. Test anxiety insignificantly predicted male students' chemistry achievement.
12. Academic self-efficacy insignificantly predicted female students' chemistry achievement.

13. Attribution styles (self-effort, luck and teacher) insignificantly predicted female students' chemistry achievement.
14. Test anxiety insignificantly predicted female students' chemistry achievement.
15. Working together, the three predictor variables were significantly related to chemistry achievement.

5.2 Conclusion

Based on the findings of the study, it was concluded that most of the students possessed high academic self-efficacy and attributed both their success and failure to self-effort. Most students are anxious about chemistry achievement test. Secondary school students in the study area had an average achievement score in chemistry. The results of this study presented evidence of the existence of a relationship between self-efficacy, attribution styles and test anxiety and chemistry achievement. It was found that self-efficacy, attribution styles (luck and teacher) and test anxiety positively and insignificantly predicted chemistry achievement while self-effort attribution style negatively and insignificantly predicted chemistry achievement. Overall, self-efficacy, attribution styles and test anxiety however had poor positive predictive value meaning that to some extent, self-efficacy, attribution styles and test anxiety predicted chemistry achievement irrespective of gender. However, other factors are contributing more to students' achievement in chemistry other than their self-efficacy, attribution styles and test anxiety. More so, self-efficacy belief, attribution styles (self-effort, luck and teacher) and test anxiety of secondary school students significantly predict their chemistry achievement scores when combined together. It is therefore important to enhance aspects of schooling and learning that improve self-efficacy belief, attribution styles and test anxiety as high levels of these variables with the learning process predicts to an extent the level of chemistry achievement.

5.3 Implications of the Findings

The findings of the study have implications for science education and curriculum planning in Nigeria. For one thing, the study has provided empirical evidence to support the fact that self-efficacy, attribution styles and test anxiety individually and jointly predicted insignificantly with students' chemistry achievement. Although, these predictions are poor irrespective of students' gender. Self-efficacy, attribution styles and test anxiety predicted positively while self-effort attribution style is a negative predictor of students' achievement in chemistry. These variables contributed little to the variance observed in chemistry achievement of secondary school students. The implication of this is that high self-efficacy belief would lead to little increase in students' chemistry achievement. This means that the more students attribute their success to luck and teacher, the less they achieve poorly.

This implies that other factors are contributing more to students' achievement in chemistry other than their self-efficacy, attribution style and test anxiety. This by implication goes to show that knowledge of students' self-efficacy, attribution styles and test anxiety cannot predict what their achievement in chemistry would likely be. However, it means that school authorities especially teachers will now understand and be aware of the link between these variables and chemistry achievement of students. When the students understand that their failures are a result of low self-efficacy, unhealthy attribution styles and high anxiety level rather than ability, they will probably exhibit a greater persistence to overcome their failures rather than developing an attitude of helplessness. Teachers must be trained about the strategies which are related to the high self-efficacy, healthy attribution styles and low anxiety level. This suggests the need to help secondary school students overcome every problem associated with these variables. Such help and effort, by parents and teachers, will go a long way to increasing students' achievement in chemistry and at the same time help students

to belief in their own capability, attribute their success or failure to internal factors as well as reduce their anxiety level.

Another implication is that research needs to be conducted to confirm these findings and to investigate whether they have any implications for working with chemistry students to improve their academic achievement. Finally, practical research needs to be done to develop and assess programs for counselors, teachers and school administrators to use on an individual, in the classroom and on institutional level respectively. More so, students irrespective of their gender will take responsibility to seek for anxiety management help from teachers, counselors, etc.

5.4 Recommendations

Based on the findings of the study, the following recommendations are made:

1. Students should be trained by school authorities, on skills that can be utilized in improving their academic self-efficacy. This will help in bringing those students who have no confidence to view themselves as capable of better performance in chemistry.
2. There should be continuous public enlightenment campaign on the importance of self-efficacy and attribution styles. This enlightenment campaign should be carried out at the national, state and local government levels by the government through the ministries of education.
3. Chemistry teachers should be sponsored on seminar and conferences associated with psychological constructs (self-efficacy, attribution styles and test anxiety) by the government so as to encourage the students to maintain low level of anxiety.
4. Attribution style was found to positively and significantly predict chemistry achievement. School management and teachers should equip the students with knowledge and skills, and given them opportunities that will improve their attribution style.

5. Academic self-efficacy should be nurtured among students by teachers, parents and all other educational stakeholders.

5.5 Limitations of the Study

The researcher encountered some limitations while carrying out this study. The sample of the study comprised of SS II students in public secondary schools in Imo State and therefore the results may not be generalized to other students in other States. Another limitation was contributed by the fact that there could have been other defining factors that may make generalization of results among students in other States and in private schools inappropriate. The research instruments were based on self-reporting of experiences which may have been prone to biases. To cater for this, the researcher assured the participants of confidentiality. Chemistry achievement was based on teacher evaluations over a period of three consecutive terms which may have been inconsistent due to factors such as teacher attrition. The researcher however, obtained the mean scores for three consecutive terms in an attempt to eliminate bias and inconsistencies. Despite all these, the researcher was able to come to conclusion of the study.

5.6 Suggestions for Further Studies

The following suggestions for further studies are made:

1. Self-efficacy, attribution styles and test anxiety as determinants of chemistry achievement among low achievers in Imo State.
2. Investigation of self-efficacy, attribution styles and test anxiety as correlates of chemistry retention scores among secondary school students in Imo State.
3. Relationship between chemistry self-efficacy and motivation to learn chemistry among secondary school students in Imo State.

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APPENDIX A

NUMBER OF SCHOOLS IN IMO STATE ACCORDING TO ZONES

S/N	Education zone	No of Schools in different zones
1	Owerri zone I	74
2	Owerri zone II	50
3	Orlu zone I	65
4	Orlu zone II	40
5	Okigwe zone I	30
6	Okigwe zone II	36
	Total	295

APPENDIX B

POPULATION DISTRIBUTION BY EDUCATION ZONES AND GENDER

S/N	Education Zone	Population of SS2 Chemistry Students		Total
		Male	Female	
1	Owerri zone I	2,648	2,614	5,262
2	Owerri zone II	1,790	1,765	3,555
3	Orlu zone I	1,345	1,759	3,104
4	Orlu zone II	1,120	790	1,910
5	Okigwe zone I	447	676	1,123
6	Okigwe zone II	727	621	1,348
	Total	8,077	8,225	16,302

Source: Imo State Secondary Education Management Board, 2018.

APPENDIX C

SAMPLE DISTRIBUTION OF THE ZONES AND SCHOOLS

S/N	Education zone	No of Schools in different zones	No of Schools selected
1	Owerri zone 1	74	15
2	Okigwe zone 11	36	7
3	Orlu zone 1	65	13
	Total	189	35

APPENDIX D

SAMPLE DISTRIBUTION BY ZONES

Education Zones selected	Population of SS2 Chemistry students	No of Schools	No of sampled schools (20%)	No of students from sampled schools	Sample size
Owerri zone 1	8,817	74	15	25x15	375
Okigwe zone 11	2,471	36	7	25x7	175
Orlu zone 1	5,014	65	13	25x13	325
Total	16,302	189	35		875

APPENDIX E

SAMPLE DISTRIBUTION BY ZONE, SCHOOL AND GENDER.

S/N	OWERRI ZONE I	RESPONDENT		
		Male	Female	TOTAL
1	Comprehensive sec. sch. Ubomiri	12	13	25
2	Comprehensive sec, sch. Avuvu	12	13	25
3	Orodo secondary technical school	12	13	25
4	City college Owerri	12	13	25
5	Iho Dimeze comprehensive secondary school Ikeduru	12	13	25
6	Comprehensive Dev. Sce. Sch. Douglas	12	13	25
7	Nekede secondary school, Nekede Owerri	12	13	25
8	Ogbaku comprehensive sec. school	12	13	25
9	Obazu community secondary school Mbieri	12	13	25
10	Comprehensive sec, sch. Ogwa	12	13	25
11	Amaimo High school, Amaimo Ikeduru, Imo State.	12	13	25
12	Comprehensive sec. sch. Amakohia.	12	13	25
13	Comprehensive sec, sch. Emekuku	12	13	25
14	Naze Secondary School, Naze	12	13	25
15	Comprehensive sec, sch. Emeabiam	12	13	25
	Total	180	195	375
	ORLU ZONE I			
16	Ihite-Owerre Comm. Sec. School	12	13	25
17	Township Compreh. Sec. Sch. Amaifeke	12	13	25
18	Comprehensive sec, sch. Nkume-Isu	12	13	25
19	Akpulu secondary school Akpulu, Ideato North	12	13	25
20	Comm. Sec sch. Awo-Idemili	12	13	25
21	Comprehensive sec, sch. Amurie-Omanze	12	13	25

22	Akokwa Sec. Technical Sec. School	12	13	25
23	Secondary Technical school Dikenafai, Ideato North	12	13	25
24	Okporo Technical College Okporo Orlu	12	13	25
25	Isu Njaba High school	12	13	25
26	Secondary Tech Sch Umuowa Orlu	12	13	25
27	Nkwerre High school	12	13	25
28	Comprehensive sec, sch. Urualla	12	13	25
	Total	156	169	325
	OKIGWE ZONE II			
29	Comprehensive sec, sch. Amuzi-Ikenanzizi	12	13	25
30	Comprehensive sec, sch. Umunakanu	12	13	25
31	Agbaghara-Nsu Comprehensive sec, sch.	12	13	25
32	Umuezala-Ama Secondary school	12	13	25
33	Uboma sec school Ikperere	12	13	25
34	Madonna Science School, Etitu	12	13	25
35	Umuariam Sec. Technical School	12	13	25
	Total	84	91	175
	Sample Size	420	455	875

Source: Researcher's Field Survey, 2018.

APPENDIX F

MORGAN-JINKS STUDENT EFFICACY SCALE (MJSES)

Fill in the appropriate information below:

Name of School.....

Gender: Male () Female ()

Instruction: Tick (✓) For any option selected and don't tick a number twice.

RA: Really Agree (1), **KA:** Kind of Agree (2),
KD: Kind of Disagree (3), **RD:** Really Disagree (4)

Student Self-Efficacy Scale

S/N	Questionnaire Items	RA	KA	KD	RD
1	I work hard in school				
2	I could get the best grades in class if I tried enough.				
3	Most of my classmates like to do chemistry because it is easy.				
4	I would get better grades if my teacher liked me better.				
5	Most of my classmates work harder on their homework than I do.				
6	I am a good science student.				
7	I will graduate from high school.				
8	I go to a good school.				
9	I always get good grades when I try hard.				
10	Sometimes I think assignment is easy when the other kids in class think it is hard.				
11	I am a good chemistry student.				
12	Adults who have good jobs probably were good students when they were kids.				
13	When I am old enough, I will go to college.				
14	I am one of the best students in my class.				
15	No one cares if I do well in school.				
16	My teacher thinks I am smart.				
17	It is important to go to high school.				
18	I prefer chemistry more to other science subjects.				
19	My classmates usually get better grades than I do in chemistry.				
20	What I learn in school is not important.				
21	I usually understand my homework assignments.				
22	I usually do not get good grades in chemistry because it is too hard.				
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 am a good reading student.				
26	It is not hard for me to get good grades in school.				
27	I am smart				
28	I will quit school as soon as I can.				
29	Teachers like kids even if they do not always make good grades				
30	When the teacher asks a question in chemistry, I usually know the answer even if the other kids don't				

APPENDIX G

ATTRIBUTION SCALE FOR STUDENTS (ASS)

Name of school:

Gender: Male [] Female []

Instruction: Answer honestly. There are not right or wrong answers and you will not be graded. The purpose is for you to understand how you explain your success and failure to yourself.

Below shows the nominal scale point: Usually (U) = 4; Sometimes (S) = 3; Rarely (R) = 2; Never = 1

S/N	When I do well in chemistry, it's because:	U	S	R	N
1	I studied/worked really hard				
2	I had a good day				
3	Chemistry comes easy to me				
4	The teacher likes me				
5	I ask for help from my teacher and/or friends				
6	The test/labs/work is easy				
7	I know strategies for learning/doing the work				
8	I had good luck				
9	I pay attention in class				
10	I'm pretty smart				
	When I don't do well in chemistry, it's because:				
11	My lab partner did not help me				
12	The task was too hard				
13	I didn't study very much or work very hard				
14	I didn't ask for help even though I should have				
15	The teacher doesn't like me				
16	I'm just not a chemistry person				
17	I had bad luck				
18	I didn't pay attention in class				
19	I'm not that smart at chemistry				
20	I had a bad day				
21	The teacher is not fair				
22	I did not know strategies to learn/do the work				

Note: This scale has two sections, the first section talks about attribution to success while the second part talks about attribution to failure.

For section A, item 1, 3, 6, 7, 9 and 10 are items on students effort, item 2 and 8 are for luck while item 4 and 5 are for teacher.

For section B, items 12, 13, 16, 18, 19, 22 are for students. Items 17 and 20 are for luck while item 11, 14, 15 and 21 are for teacher.

APPENDIX H

TEST ANXIETY SCALE

Fill in the Appropriate Information Below:

1. Name of School:

2. Gender: Male () Female ()

Instruction: Tick (√) for any option selected and don't tick a number twice

A: Always S: Sometime R: Rarely N: Never

S/N	ITEMS	A	S	R	N
1	While taking an important exam, I find myself thinking how much brighter the other students are, than I am.				
2	I worry a great deal before taking an exam.				
3	If I knew I was going to take an exam, I would feel confident and relaxed.				
4	While taking an important exam, I perspire a great deal.				
5	I feel very panicky when I have to take an impromptu or surprise exam.				
6	During a test, I find myself thinking of the consequence of failing.				
7	After important test, I am frequently so tense my stomach gets upset.				
8	Feeling of failure do not interfere with my performance.				
9	During an examination, I frequently get so nervous that I forget facts I really know.				
10	I seem already defeated while working on important tests.				
11	The harder I work at studying for a test, the more confused I get.				
12	During exams, I sometimes wonder if I'll ever get through school.				
13	I would rather write an assignment than take an examination in any subject.				
14	I wish examination did not bother me so much.				
15	Thinking about the grade I may get in a course interferes with my studying and performance on tests.				
16	If examination could be done away with, I think I would actually learn more.				
17	On exams I take the attitude, "if I don't know it now, there's no point in worrying about it".				
18	Thoughts of doing poorly interfere with my performance on tests.				
19	I do not study any harder for final exams than for the rest of my coursework.				
20	Even when I'm well prepared for a test, I feel very anxious about it.				
21	I do not enjoy eating before an important test.				
22	Before an important examination, I find my hands or arms trembling.				
23	I feel the need for "cramming" before an exam.				
24	The school should recognize that some students are more nervous than others about test and that this affects their performance.				
25	I start feeling very uneasy just before getting my marked test paper back from the teacher.				

APPENDIX I

DETAILED RELIABILITY COMPUTATION OF THE INSTRUMENTS USING CRONBACH ALPHA TECHNIQUE

1. Morgan & Jink Self-efficacy Reliability

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
1	4	3	2	3	3	2	1	2	3	3	2	3	2	3	2
2	3	3	2	3	4	4	3	3	4	3	4	3	3	4	3
3	4	4	2	4	4	2	4	4	4	4	4	4	4	4	2
4	4	4	2	4	4	2	4	4	4	4	4	4	4	4	2
5	3	4	4	4	3	3	4	4	3	4	3	4	4	3	3
6	4	4	4	4	3	3	4	4	4	3	4	4	4	4	4
7	4	4	3	3	3	3	3	4	3	4	4	4	4	3	3
8	4	4	4	3	3	4	4	2	4	2	4	3	3	4	4
9	4	4	4	3	3	3	3	4	4	4	3	4	3	4	3
10	4	3	4	2	1	2	2	2	4	3	4	3	4	4	4
11	4	3	4	3	4	3	4	3	4	3	4	3	3	3	3
12	4	3	2	3	4	3	3	3	3	3	3	3	3	4	4
13	4	4	3	4	4	1	2	4	4	4	4	2	4	3	4
14	3	3	3	4	3	3	3	4	3	3	3	4	4	4	4
15	4	4	2	4	3	4	4	2	4	4	3	3	4	3	2
16	3	3	3	3	3	4	4	3	2	4	4	4	4	4	4
17	4	3	2	3	4	1	1	1	3	4	4	1	3	2	1
18	4	4	3	4	4	3	4	3	4	4	4	4	4	2	3
19	3	4	2	4	3	3	4	1	2	4	3	4	4	4	3
20	4	4	1	4	4	1	4	1	4	4	4	3	4	4	1

Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30
3	2	3	2	3	2	3	3	3	3	2	3	3	2	3
3	4	4	4	3	3	4	3	3	2	2	3	4	3	4
2	2	3	1	4	4	4	4	4	4	1	4	4	4	4
2	2	3	1	4	4	4	4	4	4	1	4	4	4	4
4	3	1	2	3	4	3	3	3	2	1	3	3	3	3
4	3	3	1	1	3	4	4	4	3	1	4	4	3	4
3	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	3	4	3	4	3	4	3	4	3	4	3	4	4	4
4	4	4	4	3	3	4	3	3	4	4	4	4	4	4
4	3	3	3	3	3	4	3	4	4	4	3	4	3	4
3	3	3	3	2	3	3	3	3	3	2	2	2	2	2
3	4	3	4	3	4	3	4	3	4	3	4	3	4	3
4	2	2	1	4	4	4	2	3	2	1	2	4	4	4
4	4	2	1	4	4	4	4	4	3	1	4	4	4	4
1	1	1	1	4	4	4	2	1	4	1	3	4	3	4
3	3	2	2	2	3	4	3	3	2	3	3	3	3	3
1	2	1	1	2	4	4	3	2	2	1	3	3	3	3
4	2	2	3	3	3	4	2	4	3	2	2	4	4	4
3	4	1	1	2	4	4	4	4	3	1	4	3	3	3
1	2	2	1	4	4	4	1	4	4	1	3	4	4	4

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	.0
	Total	20	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.809	30

This Cronbach Alpha reliability coefficient of **0.81** shows that the instrument (MJSES) is reliable and suitable for the study.

1. Attribution Scale for Students (ASS)

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
1	2	1	2	3	3	2	3	2	3	2	3
2	4	3	3	4	3	4	3	4	3	3	4
3	2	4	4	4	4	4	4	4	4	4	4
4	2	4	4	4	4	4	4	4	4	4	4
5	3	4	4	3	4	3	4	3	4	4	3
6	3	4	4	4	3	4	4	4	4	4	4
7	3	3	4	3	4	4	4	4	4	4	3
8	4	4	2	4	2	4	3	4	3	3	4
9	3	3	4	4	4	3	4	3	4	3	4
10	2	2	2	4	3	4	3	4	3	4	4
11	3	4	3	4	3	4	3	4	3	3	3
12	3	3	3	3	3	3	3	3	3	3	4
13	1	2	4	4	4	4	2	4	2	4	3
14	3	3	4	3	3	3	4	3	4	4	4
15	4	4	2	4	4	3	3	3	3	4	3
16	4	4	3	2	4	4	4	4	4	4	4
17	1	1	1	3	4	4	1	4	1	3	2
18	3	4	3	4	4	4	4	4	4	4	2
19	3	4	1	2	4	3	4	3	4	4	4
20	1	4	1	4	4	4	3	4	3	4	4

Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22
2	3	2	3	2	3	3	3	3	2	3
3	3	4	4	4	3	2	1	2	3	2
2	2	2	3	1	4	4	3	3	4	3
2	2	2	3	1	4	2	4	4	4	4
3	4	3	1	2	3	2	4	4	4	4
4	4	3	3	1	1	3	4	4	4	4
3	3	4	4	4	4	3	4	4	4	3
4	4	3	4	3	4	3	3	4	3	4
3	4	4	4	4	3	4	4	2	3	3
4	4	3	3	3	3	3	3	4	3	2
3	3	3	3	3	2	2	2	2	2	3
4	3	4	3	4	3	3	4	3	2	4
4	4	2	2	1	4	3	3	3	3	2
4	4	4	2	1	5	1	2	4	4	4
2	1	1	1	1	4	3	3	4	4	3
4	3	3	2	2	2	4	4	2	3	2
1	1	2	1	1	2	4	4	3	3	3
3	4	2	2	3	3	1	1	1	4	3
3	3	4	1	1	2	3	4	3	1	4
1	1	2	2	1	4	3	4	1	3	2

Case Processing Summary

		N	%
Cases	Valid	20	95.2
	Excluded ^a	1	4.8
	Total	21	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.706	22

This Cronbach Alpha coefficient of **0.71** shows that the instrument (ASS) is reliable and suitable for the study.

2. Students Test of Anxiety Scale (STAS) Reliability

S/N	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
1	4	3	2	3	3	2	1	2	3	3	2	3
2	3	3	2	3	4	4	3	3	4	3	4	3
3	4	4	2	4	4	2	4	4	4	4	4	4
4	4	4	2	4	4	2	4	4	4	4	4	4
5	3	4	4	4	3	3	4	4	3	4	3	4
6	4	4	4	4	3	3	4	4	4	3	4	4
7	4	4	3	3	3	3	3	4	3	4	4	4
8	4	4	4	3	3	4	4	2	4	2	4	3
9	4	4	4	3	3	3	3	4	4	4	3	4
10	4	3	4	2	1	2	2	2	4	3	4	3
11	4	3	4	3	4	3	4	3	4	3	4	3
12	4	3	2	3	4	3	3	3	3	3	3	3
13	4	4	3	4	4	1	2	4	4	4	4	2
14	3	3	3	4	3	3	3	4	3	3	3	4
15	4	4	2	4	3	4	4	2	4	4	3	3
16	3	3	3	3	3	4	4	3	2	4	4	4
17	4	3	2	3	4	1	1	1	3	4	4	1
18	4	4	3	4	4	3	4	3	4	4	4	4
19	3	4	2	4	3	3	4	1	2	4	3	4
20	4	4	1	4	4	1	4	1	4	4	4	3

Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25
2	3	2	3	2	3	2	3	2	3	3	3	3
4	3	3	4	3	3	4	4	4	3	2	1	2
4	4	4	4	2	2	2	3	1	4	4	3	3
4	4	4	4	2	2	2	3	1	4	2	4	4
3	4	4	3	3	4	3	1	2	3	2	4	4
4	4	4	4	4	4	3	3	1	1	3	4	4
4	4	4	3	3	3	4	4	4	4	3	4	4
4	3	3	4	4	4	3	4	3	4	3	3	4
3	4	3	4	3	4	4	4	4	3	4	4	2
4	3	4	4	4	4	3	3	3	3	3	3	4
4	3	3	3	3	3	3	3	3	2	2	2	2
3	3	3	4	4	3	4	3	4	3	3	4	3
4	2	4	3	4	4	2	2	1	4	3	3	3
3	4	4	4	4	4	4	2	1	5	1	2	4
3	3	4	3	2	1	1	1	1	4	3	3	4
4	4	4	4	4	3	3	2	2	2	4	4	2
4	1	3	2	1	1	2	1	1	2	4	4	3
4	4	4	2	3	4	2	2	3	3	1	1	1
3	4	4	4	3	3	4	1	1	2	3	4	3
4	3	4	4	1	1	2	2	1	4	3	4	1
4	3	4	4	1	1	2	2	1	4	1	4	1

Case Processing Summary

		N	%
Cases	Valid	20	100.0
	Excluded ^a	0	.0
	Total	20	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.780	25

This Cronbach Alpha coefficient of **0.78** shows that the instrument (STAS) is reliable and suitable for the study.

APPENDIX J
RAW SCORES

S/N	MJSES	TAS	AS	AL	AT	BS	BL	BT	CAS	GENDER
1	74	67	15	4	3	13	5	13	55.7	Male
2	82	64	15	4	3	13	5	14	51.3	Male
3	73	68	17	5	4	15	3	4	58	Male
4	82	68	16	5	4	14	3	13	44.7	Male
5	94	79	17	5	4	15	3	4	49.7	Male
6	86	65	21	7	6	19	5	8	44	Male
7	81	47	18	6	5	16	4	5	51	Male
8	82	64	14	4	3	12	5	14	47.3	Male
9	87	68	16	5	4	14	3	13	64	Male
10	73	86	15	4	3	13	5	13	60	Male
11	75	82	23	8	7	21	6	10	49.3	Male
12	82	77	18	5	4	16	3	5	53.7	Male
13	91	68	23	8	7	21	6	10	69	Male
14	88	42	12	3	2	10	8	16	57.7	Male
15	69	70	17	5	4	15	3	4	83	Male
16	85	63	18	5	4	16	3	5	54.7	Male
17	77	51	12	3	2	10	8	16	47.7	Male
18	78	80	17	5	4	15	3	4	56.7	Male
19	80	72	24	8	7	22	6	11	60	Male
20	85	60	12	3	2	10	8	16	49.3	Male
21	83	60	15	4	3	13	6	13	68	Male
22	75	65	13	3	2	11	8	16	51.3	Male
23	82	68	19	6	5	17	4	6	59.9	Male
24	70	53	16	5	4	14	3	13	56.7	Male
25	75	53	16	5	4	14	3	13	50.7	Male

26	65	61	17	5	4	15	3	4	57.7	Male
27	86	67	13	3	2	11	8	16	56.7	Male
28	95	69	18	5	4	16	3	5	57.7	Male
29	90	76	23	8	7	21	6	9	51.3	Male
30	82	41	14	4	3	12	2	16	51.3	Male
31	79	64	18	6	5	16	4	5	64.7	Male
32	77	65	19	6	5	17	4	6	67	Male
33	77	61	16	5	4	14	3	13	68.3	Male
34	80	64	15	4	3	13	2	13	60.7	Male
35	66	77	19	6	5	17	4	6	69.3	Male
36	85	79	16	5	4	14	3	13	79	Male
37	80	68	13	3	2	11	8	16	45.3	Male
38	82	64	15	4	3	13	2	14	68	Male
39	73	68	17	5	4	15	3	4	75.3	Male
40	82	68	16	5	4	14	3	13	65.3	Male
41	94	79	17	5	4	15	3	4	78.3	Male
42	86	65	21	7	6	19	5	8	83.7	Male
43	81	47	18	6	5	16	4	5	64	Male
44	82	64	14	4	3	12	2	14	71.2	Male
45	87	68	16	5	4	14	3	13	78.3	Male
46	73	86	15	4	3	13	2	13	30.6	Male
47	75	82	23	8	7	21	6	10	86	Male
48	82	77	18	5	4	16	3	5	64.3	Male
49	91	68	23	8	7	21	6	10	62.3	Male
50	88	42	12	3	2	10	8	16	74.3	Male
51	69	70	17	5	4	15	3	4	69.7	Male
52	85	63	18	5	4	16	3	5	68.7	Male
53	77	51	12	3	2	10	8	4	73.3	Male

54	78	80	17	5	4	15	3	4	76.7	Male
55	80	72	24	8	7	22	6	11	64.7	Male
56	85	60	12	3	2	10	8	16	68.3	Male
57	83	60	15	4	3	13	2	13	79	Male
58	75	65	13	3	2	11	8	16	45	Male
59	82	68	19	6	5	17	4	6	54	Male
60	70	53	16	5	4	14	3	13	41.3	Male
61	75	53	16	5	4	14	3	13	45.3	Male
62	65	61	17	5	4	15	3	4	50	Male
63	86	67	13	3	2	11	8	16	70	Male
64	95	69	18	5	4	16	3	5	61.5	Male
65	90	76	23	8	7	21	6	9	46.6	Male
66	82	41	14	4	3	12	2	16	67.3	Male
67	79	64	18	6	5	16	4	5	57.3	Male
68	77	65	19	6	5	17	4	6	55.7	Male
69	82	64	15	4	3	13	2	14	51.3	Male
70	73	68	17	5	4	15	3	4	67	Male
71	82	68	16	5	4	14	3	13	66.7	Male
72	94	79	17	5	4	15	3	4	69.3	Male
73	86	65	21	7	6	19	5	8	43.3	Male
74	81	47	18	6	5	16	4	5	66.7	Male
75	82	64	14	4	3	12	2	14	77.3	Male
76	87	68	16	5	4	14	3	13	31.7	Male
77	73	86	15	4	3	13	2	13	67.3	Male
78	75	82	23	8	7	21	6	10	56.5	Male
79	82	77	18	5	4	16	3	5	67	Male
80	91	68	23	8	7	21	6	10	63.7	Male
81	88	42	12	3	2	10	8	16	70.7	Male

82	69	70	17	5	4	15	3	4	76.6	Male
83	85	63	18	5	4	16	3	5	63	Male
84	77	51	12	3	2	10	8	4	76.3	Male
85	78	80	17	5	4	15	3	4	61.3	Male
86	80	72	24	8	7	22	6	11	58.7	Male
87	85	60	12	3	2	10	8	16	46.7	Male
88	83	60	15	4	3	13	2	13	48.3	Male
89	75	65	13	3	2	11	7	16	65.3	Male
90	82	68	19	6	5	17	4	6	41.5	Male
91	70	53	16	5	4	14	3	13	50	Male
92	75	53	16	5	4	14	3	13	53.7	Male
93	65	61	17	5	4	15	3	4	34.3	Male
94	86	67	13	3	2	11	7	16	47.3	Male
95	95	69	18	5	4	16	3	5	40.7	Male
96	90	76	23	8	7	21	6	9	51.7	Male
97	82	41	14	4	3	12	2	16	52.4	Male
98	79	64	18	6	5	16	4	5	66	Male
99	77	65	19	6	5	17	4	6	55	Male
100	82	64	15	4	3	13	2	14	39.4	Male
101	73	68	17	5	4	15	3	4	50.1	Male
102	82	68	16	5	4	14	3	13	59.2	Male
103	94	79	17	5	4	15	3	4	56	Male
104	86	65	21	7	6	19	5	8	46.8	Male
105	81	47	18	6	5	16	4	5	67	Male
106	82	64	14	4	3	12	2	14	44.2	Male
107	87	68	16	5	4	14	3	13	46.1	Male
108	73	86	15	4	3	13	2	13	52.1	Male
109	75	82	23	8	7	21	6	10	50.2	Male

110	82	77	18	5	4	16	3	5	54.7	Male
111	91	68	23	8	7	21	6	10	56.8	Male
112	88	42	12	3	2	10	7	16	47.3	Male
113	69	70	17	5	4	15	3	4	52.3	Male
114	85	63	18	5	4	16	3	5	56.7	Male
115	77	51	12	3	2	10	7	4	45.6	Male
116	78	80	17	5	4	15	3	4	49.3	Male
117	80	72	24	8	7	22	6	11	56.3	Male
118	85	60	12	3	2	10	7	16	60	Male
119	83	60	15	4	3	13	2	13	66	Male
120	75	65	13	3	2	11	7	16	62.2	Male
121	82	68	19	6	5	17	4	6	56.3	Male
122	70	53	16	5	4	14	3	13	62	Male
123	75	53	16	5	4	14	3	13	50	Male
124	65	61	17	5	4	15	3	4	60.1	Male
125	86	67	13	3	2	11	7	16	50.1	Male
126	95	69	18	5	4	16	3	5	58.1	Male
127	90	76	23	8	7	21	6	9	55.2	Male
128	82	41	14	4	3	12	2	16	52.7	Male
129	79	64	18	6	5	16	4	5	51.8	Male
130	77	65	19	6	5	17	4	6	57.7	Male
131	82	64	15	4	3	13	2	14	51.6	Male
132	73	68	17	5	4	15	3	4	51.6	Male
133	82	68	16	5	4	14	3	13	51.4	Male
134	94	79	17	5	4	15	3	4	49	Male
135	86	65	21	7	6	19	5	8	46.7	Male
136	81	47	18	6	5	16	4	5	45.9	Male
137	82	64	14	4	3	12	2	14	45	Male

138	87	68	16	5	4	14	3	13	43.3	Male
139	73	86	15	4	3	13	2	13	43.2	Male
140	75	82	23	8	7	21	6	10	40.2	Male
141	82	77	18	5	4	16	3	5	39	Male
142	91	68	23	8	7	21	6	10	38.6	Male
143	88	42	12	3	2	10	7	16	36.4	Male
144	69	70	17	5	4	15	3	4	35.5	Male
145	85	63	18	5	4	16	3	5	35.8	Male
146	77	51	12	3	2	10	7	4	35.4	Male
147	78	80	17	5	4	15	3	4	35	Male
148	80	72	24	8	7	22	6	11	34.6	Male
149	85	60	12	3	2	10	7	16	33.2	Male
150	83	60	15	4	3	13	2	13	32	Male
151	75	65	13	3	2	11	7	16	47.1	Male
152	82	68	19	6	5	17	4	6	47.3	Male
153	70	53	16	5	4	14	3	13	47.6	Male
154	75	53	16	5	4	14	3	13	48	Male
155	65	61	17	5	4	15	3	4	48.2	Male
156	86	67	13	3	2	11	7	16	48.3	Male
157	95	69	18	5	4	16	3	5	49.1	Male
158	90	76	23	8	7	21	6	9	49.5	Male
159	82	41	14	4	3	12	2	16	50.2	Male
160	79	64	18	6	5	16	4	5	50.2	Male
161	77	65	19	6	5	17	4	6	50.8	Male
162	82	64	15	4	3	13	2	14	50.6	Male
163	73	68	17	5	4	15	3	4	51.6	Male
164	82	68	16	5	4	14	3	13	52	Male
165	94	79	17	5	4	15	3	4	54	Male

166	86	65	21	7	6	19	5	8	41.3	Male
167	81	47	18	6	5	16	4	5	45.3	Male
168	82	64	14	4	3	12	2	14	50	Male
169	87	68	16	5	4	14	3	13	70	Male
170	73	86	15	4	3	13	2	13	61.5	Male
171	75	82	23	8	7	21	6	10	46.6	Male
172	82	77	18	5	4	16	3	5	67.3	Male
173	91	68	23	8	7	21	6	10	57.3	Male
174	88	42	12	3	2	10	7	16	55.7	Male
175	69	70	17	5	4	15	3	4	51.3	Male
176	85	63	18	5	4	16	3	5	67	Male
177	77	51	12	3	2	10	7	4	66.7	Male
178	78	80	17	5	4	15	3	4	69.3	Male
179	80	72	24	8	7	22	6	11	43.3	Male
180	85	60	12	3	2	10	7	16	66.7	Male
181	83	60	15	4	3	13	2	13	67.3	Male
182	75	65	13	3	2	11	7	16	31.7	Male
183	82	68	19	6	5	17	4	6	67.3	Male
184	70	53	16	5	4	14	3	13	56.5	Male
185	75	53	16	5	4	14	3	13	67	Male
186	65	61	17	5	4	15	3	4	63.7	Male
187	86	67	13	3	2	11	7	16	70.7	Male
188	95	69	18	5	4	16	3	5	76.6	Male
189	90	76	23	8	7	21	6	9	63	Male
190	82	41	14	4	3	12	2	16	76.3	Male
191	79	64	18	6	5	16	4	5	61.3	Male
192	77	65	19	6	5	17	4	6	58.7	Male
193	82	64	15	4	3	13	2	14	46.7	Male

194	73	68	17	5	4	15	3	4	48.3	Male
195	82	68	16	5	4	14	3	13	65.3	Male
196	94	79	17	5	4	15	3	4	41	Male
197	86	65	21	7	6	19	5	8	50	Male
198	81	47	18	6	5	16	4	5	53.7	Male
199	82	64	14	4	3	12	2	14	34.3	Male
200	87	68	16	5	4	14	3	13	47.3	Male
201	73	86	15	4	3	13	2	13	40.7	Male
202	75	82	23	8	7	21	6	10	51.7	Male
203	82	77	18	5	4	16	3	5	52	Male
204	91	68	23	8	7	21	6	10	66	Male
205	88	42	12	3	2	10	7	16	55	Male
206	69	70	17	5	4	15	3	4	67.3	Male
207	85	63	18	5	4	16	3	5	31.7	Male
208	77	51	12	3	2	10	7	4	67.3	Male
209	78	80	17	5	4	15	3	4	56.5	Male
210	80	72	24	8	7	22	6	11	67	Male
211	85	60	12	3	2	10	7	16	63.7	Male
212	83	60	15	4	3	13	2	13	70.7	Male
213	75	65	13	3	2	11	7	16	76.6	Male
214	82	68	19	6	5	17	4	6	63	Male
215	70	53	16	5	4	14	3	13	76.3	Male
216	75	53	16	5	4	14	3	13	61.3	Male
217	65	61	17	5	4	15	3	4	58.7	Male
218	86	67	13	3	2	11	7	16	46.7	Male
219	95	69	18	5	4	16	3	5	48.3	Male
220	90	76	23	8	7	21	6	9	65.3	Male
221	82	41	14	4	3	12	2	16	45.6	Male

222	79	64	18	6	5	16	4	5	45.9	Male
223	77	65	19	6	5	17	4	6	56.1	Male
224	82	64	15	4	3	13	2	14	60	Male
225	73	68	17	5	4	15	3	4	66	Male
226	82	68	16	5	4	14	3	13	62.2	Male
227	94	79	17	5	4	15	3	4	56.3	Male
228	86	65	21	7	6	19	5	8	62	Male
229	81	47	18	6	5	16	4	5	50	Male
230	82	64	14	4	3	12	2	14	60.1	Male
231	87	68	16	5	4	14	3	13	50.1	Male
232	73	86	15	4	3	13	2	13	58.1	Male
233	75	82	23	8	7	21	6	10	55.2	Male
234	82	77	18	5	4	16	3	5	52.7	Male
235	91	68	23	8	7	21	6	10	51.8	Male
236	88	42	12	3	2	10	7	16	57.7	Male
237	69	70	17	5	4	15	3	4	51.6	Male
238	85	63	18	5	4	16	3	5	51.6	Male
239	77	51	12	3	2	10	7	4	51.4	Male
240	78	80	17	5	4	15	3	4	49	Male
241	80	72	24	8	7	22	6	11	46.7	Male
242	85	60	12	3	2	10	7	16	45.9	Male
243	83	60	15	4	3	13	2	13	45	Male
244	75	65	13	3	2	11	7	16	43.3	Male
245	82	68	19	6	5	17	4	6	43.2	Male
246	70	53	16	5	4	14	3	13	40.2	Male
247	75	53	16	5	4	14	3	13	39	Male
248	65	61	17	5	4	15	3	4	38.6	Male
249	86	67	13	3	2	11	7	16	36.4	Male

250	95	69	18	5	4	16	3	5	35.5	Male
251	90	76	23	8	7	21	6	9	35.8	Male
252	82	41	14	4	3	12	2	16	35.4	Male
253	79	64	18	6	5	16	4	5	35	Male
254	77	65	19	6	5	17	4	6	34.6	Male
255	82	64	15	4	3	13	2	14	33.2	Male
256	73	68	17	5	4	15	3	4	32	Male
257	82	68	16	5	4	14	3	13	47.1	Male
258	94	79	17	5	4	15	3	4	47.3	Male
259	86	65	21	7	6	19	5	8	47.6	Male
260	81	47	18	6	5	16	4	5	48	Male
261	82	64	14	4	3	12	2	14	48.2	Male
262	87	68	16	5	4	14	3	13	48.3	Male
263	73	86	15	4	3	13	2	13	49.1	Male
264	75	82	23	8	7	21	6	10	49.5	Male
265	82	77	18	5	4	16	3	5	50.2	Male
266	91	68	23	8	7	21	6	10	51.3	Male
267	88	42	12	3	2	10	7	16	51.3	Male
268	69	70	17	5	4	15	3	4	64.7	Male
269	85	63	18	5	4	16	3	5	67	Male
270	77	51	12	3	2	10	7	4	68.3	Male
271	78	80	17	5	4	15	3	4	60.7	Male
272	80	72	24	8	7	22	6	11	69.3	Male
273	85	60	12	3	2	10	7	16	79	Male
274	83	60	15	4	3	13	2	13	45.3	Male
275	75	65	13	3	2	11	7	16	68	Male
276	82	68	19	6	5	17	4	6	75.3	Male
277	70	53	16	5	4	14	3	13	65.3	Male

278	75	53	16	5	4	14	3	13	78.3	Male
279	65	61	17	5	4	15	3	4	83.7	Male
280	86	67	13	3	2	11	7	16	64	Male
281	95	69	18	5	4	16	3	5	91	Male
282	90	76	23	8	7	21	6	9	78.3	Male
283	82	41	14	4	3	12	2	16	30.6	Male
284	79	64	18	6	5	16	4	5	86	Male
285	77	65	19	6	5	17	4	6	64.3	Male
286	82	64	15	4	3	13	2	14	62.3	Male
287	73	68	17	5	4	15	3	4	74.3	Male
288	82	68	16	5	4	14	3	13	69.7	Male
289	94	79	17	5	4	15	3	4	68.7	Male
290	86	65	21	7	6	19	5	8	73.3	Male
291	81	47	18	6	5	16	4	5	76.7	Male
292	82	64	14	4	3	12	2	14	64.7	Male
293	87	68	16	5	4	14	3	13	68.3	Male
294	73	86	15	4	3	13	2	13	79	Male
295	75	82	23	8	7	21	6	10	45	Male
296	82	77	18	5	4	16	3	5	54	Male
297	91	68	23	8	7	21	6	10	41.3	Male
298	88	42	12	3	2	10	7	16	45.3	Male
299	69	70	17	5	4	15	3	4	50	Male
300	85	63	18	5	4	16	3	5	70	Male
301	77	51	12	3	2	10	7	4	61.5	Male
302	78	80	17	5	4	15	3	4	46.6	Male
303	80	72	24	8	7	22	6	11	67.3	Male
304	85	60	12	3	2	10	7	16	57.3	Male
305	83	60	15	4	3	13	2	13	55.7	Male

306	75	65	13	3	2	11	7	16	51.3	Male
307	82	68	19	6	5	17	4	6	67	Male
308	70	53	16	5	4	14	3	13	66.7	Male
309	75	53	16	5	4	14	3	13	69.3	Male
310	65	61	17	5	4	15	3	4	43.3	Male
311	86	67	13	3	2	11	7	16	66.7	Male
312	95	69	18	5	4	16	3	5	77.3	Male
313	90	76	23	8	7	21	6	9	31.7	Male
314	82	41	14	4	3	12	2	16	67.3	Male
315	79	64	18	6	5	16	4	5	56.5	Male
316	77	65	19	6	5	17	4	6	67	Male
317	82	64	15	4	3	13	2	14	63.7	Male
318	73	68	17	5	4	15	3	4	70.7	Male
319	82	68	16	5	4	14	3	13	76.6	Male
320	94	79	17	5	4	15	3	4	63	Male
321	86	65	21	7	6	19	5	8	76.3	Male
322	81	47	18	6	5	16	4	5	61.3	Male
323	82	64	14	4	3	12	2	14	58.7	Male
324	87	68	16	5	4	14	3	13	46.7	Male
325	73	86	15	4	3	13	2	13	48.3	Male
326	75	82	23	8	7	21	6	10	65.3	Male
327	82	77	18	5	4	16	3	5	41	Male
328	91	68	23	8	7	21	6	10	50	Male
329	88	42	12	3	2	10	7	16	53.7	Male
330	69	70	17	5	4	15	3	4	34.3	Male
331	85	63	18	5	4	16	3	5	47.3	Male
332	77	51	12	3	2	10	7	4	40.7	Male
333	78	80	17	5	4	15	3	4	51.7	Male

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335	85	60	12	3	2	10	7	16	66	Male
336	83	60	15	4	3	13	2	13	55	Male
337	75	65	13	3	2	11	7	15	29	Male
338	82	68	19	6	5	17	4	6	20	Male
339	70	53	16	5	4	14	3	13	59	Male
340	75	53	16	5	4	14	3	13	56	Male
341	65	61	17	5	4	15	3	4	36	Male
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343	95	69	18	5	4	16	3	5	38.6	Male
344	90	76	23	8	7	21	6	9	36.4	Male
345	82	41	14	4	3	12	2	15	35.5	Male
346	79	64	18	6	5	16	4	5	35.8	Male
347	77	65	19	6	5	17	4	6	35.4	Male
348	82	64	15	4	3	13	2	14	35	Male
349	73	68	17	5	4	15	3	4	34.6	Male
350	82	68	16	5	4	14	3	13	33.2	Male
351	94	79	17	5	4	15	3	4	32	Male
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353	81	47	18	6	5	16	4	5	47.3	Male
354	82	64	14	4	3	12	2	14	47.6	Male
355	87	68	16	5	4	14	3	13	48	Male
356	73	86	15	4	3	13	2	13	48.2	Male
357	75	82	23	8	7	21	6	10	48.3	Male
358	82	77	18	5	4	16	3	5	56.3	Male
359	91	68	23	8	7	21	6	10	62	Male
360	88	42	12	3	2	10	7	16	50	Male
361	69	70	17	5	4	15	3	4	60.1	Male

362	85	63	18	5	4	16	3	5	50.1	Male
363	77	51	12	3	2	10	7	4	58.1	Male
364	78	80	17	5	4	15	3	4	55.2	Male
365	80	72	24	8	7	22	6	11	52.7	Male
366	85	60	12	3	2	10	7	16	51.8	Male
367	83	60	15	4	3	13	2	13	57.7	Male
368	75	65	13	3	2	11	7	15	51.6	Male
369	82	68	19	6	5	17	4	6	51.6	Male
370	70	53	16	5	4	14	3	13	51.4	Male
371	75	53	16	5	4	14	3	13	49	Male
372	65	61	17	5	4	15	3	4	46.7	Male
373	86	67	13	3	2	11	6	15	44.7	Male
374	95	69	18	5	4	16	3	5	49.7	Male
375	90	76	23	8	7	21	6	9	44	Male
376	82	41	14	4	3	12	2	15	51	Male
377	79	64	18	6	5	16	4	5	47.3	Male
378	77	65	19	6	5	17	4	6	64	Male
379	82	64	15	4	3	13	2	14	60	Male
380	73	68	17	5	4	15	3	4	49.3	Male
381	82	68	16	5	4	14	3	13	53.7	Male
382	94	79	17	5	4	15	3	4	69	Male
383	86	65	21	7	6	19	5	8	57.7	Male
384	81	47	18	6	5	16	4	5	83	Male
385	82	64	14	4	3	12	2	14	54.7	Male
386	87	68	16	5	4	14	3	13	47.7	Male
387	73	86	15	4	3	13	2	13	56.7	Male
388	75	82	23	8	7	21	6	10	60	Male
389	82	77	18	5	4	16	3	5	49.3	Male

390	91	68	23	8	7	21	6	10	68	Male
391	88	42	12	3	2	10	6	16	51.3	Male
392	69	70	17	5	4	15	3	4	59.9	Male
393	85	63	18	5	4	16	3	5	56.7	Male
394	77	51	12	3	2	10	6	4	50.7	Male
395	78	80	17	5	4	15	3	4	57.7	Male
396	80	72	24	8	7	22	6	11	56.7	Male
397	85	60	12	3	2	10	6	16	57.7	Male
398	83	60	15	4	3	13	2	13	51.3	Male
399	75	65	13	3	2	11	6	15	51.3	Male
400	82	68	19	6	5	17	4	6	64.7	Male
401	70	53	16	5	4	14	3	13	67	Male
402	75	53	16	5	4	14	3	13	68.3	Male
403	65	61	17	5	4	15	3	4	60.7	Male
404	86	67	13	3	2	11	6	15	69.3	Male
405	95	69	18	5	4	16	3	5	79	Male
406	90	76	23	8	7	21	6	9	45.3	Male
407	82	41	14	4	3	12	2	15	68	Male
408	79	64	18	6	5	16	4	5	75.3	Male
409	77	65	19	6	5	17	4	6	65.3	Male
410	82	64	15	4	3	13	2	14	78.3	Male
411	73	68	17	5	4	15	3	4	83.7	Male
412	82	68	16	5	4	14	3	13	64	Male
413	94	79	17	5	4	15	3	4	91	Male
414	86	65	21	7	6	19	5	8	78.3	Male
415	81	47	18	6	5	16	4	5	30.6	Male
416	82	64	14	4	3	12	2	14	86	Male
417	87	68	16	5	4	14	3	13	64.3	Male

418	73	86	15	4	3	13	2	13	62.3	Male
419	75	82	23	8	7	21	6	10	74.3	Female
420	82	77	18	5	4	16	3	5	69.7	Female
421	91	68	23	8	7	21	6	10	68.7	Female
422	88	42	12	3	2	10	6	16	73.3	Female
423	69	70	17	5	4	15	3	4	76.7	Female
424	85	63	18	5	4	16	3	5	64.7	Female
425	77	51	12	3	2	10	6	4	68.3	Female
426	78	80	17	5	4	15	3	4	79	Female
427	80	72	24	8	7	22	6	11	45	Female
428	85	60	12	3	2	10	6	16	54	Female
429	83	60	15	4	3	13	2	13	41.3	Female
430	75	65	13	3	2	11	6	15	45.3	Female
431	82	68	19	6	5	17	4	6	50	Female
432	70	53	16	5	4	14	3	13	70	Female
433	75	53	16	5	4	14	3	13	61.5	Female
434	65	61	17	5	4	15	3	4	46.6	Female
435	86	67	13	3	2	11	6	15	67.3	Female
436	95	69	18	5	4	16	3	5	57.3	Female
437	90	76	23	8	7	21	6	9	55.7	Female
438	82	41	14	4	3	12	2	15	51.3	Female
439	79	64	18	6	5	16	4	5	67	Female
440	77	65	19	6	5	17	4	6	66.7	Female
441	82	64	15	4	3	13	2	14	69.3	Female
442	73	68	17	5	4	15	3	4	43.3	Female
443	82	68	16	5	4	14	3	13	66.7	Female
444	94	79	17	5	4	15	3	4	77.3	Female
445	86	65	21	7	6	19	5	8	31.7	Female

446	81	47	18	6	5	16	4	5	67.3	Female
447	82	64	14	4	3	12	2	14	56.5	Female
448	87	68	16	5	4	14	3	13	67	Female
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450	73	68	17	5	4	15	3	4	70.7	Female
451	82	68	16	5	4	14	3	12	76.6	Female
452	94	79	17	5	4	15	3	4	63	Female
453	86	65	21	7	6	19	5	8	76.3	Female
454	81	47	18	6	5	16	4	5	61.3	Female
455	82	64	14	4	3	12	2	14	58.7	Female
456	87	68	16	5	4	14	3	12	46.7	Female
457	73	86	15	4	3	13	2	12	48.3	Female
458	75	82	23	8	7	21	6	10	65.3	Female
459	82	77	18	5	4	16	3	5	41	Female
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461	88	42	12	3	2	10	6	16	53.7	Female
462	69	70	17	5	4	15	3	4	34.3	Female
463	85	63	18	5	4	16	3	5	47.3	Female
464	77	51	12	3	2	10	6	4	40.7	Female
465	78	80	17	5	4	15	3	4	51.7	Female
466	80	72	24	8	7	22	6	11	52.3	Female
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470	82	68	19	6	5	17	4	6	40.3	Female
471	70	53	16	5	4	14	3	12	59.1	Female
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474	86	67	13	3	2	11	6	15	67.8	Female
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476	90	76	23	8	7	21	6	9	46.5	Female
477	82	41	14	4	3	12	2	15	43.2	Female
478	79	64	18	6	5	16	4	5	37.6	Female
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480	82	64	15	4	3	13	2	14	37.4	Female
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483	94	79	17	5	4	15	3	4	37.6	Female
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487	87	68	16	5	4	14	3	12	60.7	Female
488	73	86	15	4	3	13	2	12	66	Female
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493	69	70	17	5	4	15	3	4	60.1	Female
494	85	63	18	5	4	16	3	5	50.1	Female
495	77	51	12	3	2	10	6	4	58.1	Female
496	78	80	17	5	4	15	3	4	55.2	Female
497	80	72	24	8	7	22	6	11	52.7	Female
498	85	60	12	3	2	10	6	16	51.8	Female
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501	82	68	19	6	5	17	4	6	51.6	Female

502	70	53	16	5	4	14	3	12	51.4	Female
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512	73	68	17	5	4	15	3	4	36.4	Female
513	82	68	16	5	4	14	3	12	35.5	Female
514	94	79	17	5	4	15	3	4	35.8	Female
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516	81	47	18	6	5	16	4	5	35	Female
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523	88	42	12	3	2	10	6	16	48	Female
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525	85	63	18	5	4	16	3	5	48.3	Female
526	77	51	12	3	2	10	6	4	49.1	Female
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543	73	68	17	5	4	15	3	4	55.7	Female
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545	94	79	17	5	4	15	3	4	67	Female
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553	94	79	17	5	4	15	3	4	56.5	Female
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568	85	60	12	3	2	10	6	16	34.3	Female
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570	75	65	13	3	2	11	6	15	40.7	Female
571	82	68	19	6	5	17	4	6	51.7	Female
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581	82	64	15	4	3	13	2	13	33.4	Female
582	73	68	17	5	4	15	3	4	46.3	Female
583	82	68	16	5	4	14	3	12	43.2	Female
584	94	79	17	5	4	15	3	4	37.6	Female
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586	81	47	18	6	5	16	4	5	37.5	Female
587	82	64	14	4	3	12	2	13	38.7	Female
588	87	68	16	5	4	14	3	12	43.2	Female
589	73	86	15	4	3	13	2	12	46.3	Female
590	75	82	23	8	7	21	6	10	56.7	Female
591	82	77	18	5	4	16	3	5	46.7	Female
592	91	68	23	8	7	21	6	10	48.9	Female
593	88	42	12	3	2	10	6	16	60	Female
594	69	70	17	5	4	15	3	4	66	Female
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596	77	51	12	3	2	10	6	4	56.3	Female
597	78	80	17	5	4	15	3	4	62	Female
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600	83	60	15	4	3	13	2	12	50.1	Female
601	75	65	13	3	2	11	6	15	58.1	Female
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603	70	53	16	5	4	14	3	12	52.7	Female
604	75	53	16	5	4	14	3	12	51.8	Female
605	65	61	17	5	4	15	3	4	57.7	Female
606	86	67	13	3	2	11	6	15	51.6	Female
607	95	69	18	5	4	16	3	5	51.6	Female
608	90	76	23	8	7	21	6	9	51.4	Female
609	82	41	14	4	3	12	2	15	49	Female
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612	82	64	15	4	3	13	2	13	45	Female
613	73	68	17	5	4	15	3	4	43.3	Female

614	82	68	16	5	4	14	3	12	43.2	Female
615	94	79	17	5	4	15	3	4	40.2	Female
616	86	65	21	7	6	19	5	8	39	Female
617	81	47	18	6	5	16	4	5	38.6	Female
618	82	64	14	4	3	12	2	13	36.4	Female
619	87	68	16	5	4	14	3	12	35.5	Female
620	73	86	15	4	3	13	2	12	35.8	Female
621	75	82	23	8	7	21	6	10	35.4	Female
622	82	77	18	5	4	16	3	5	35	Female
623	91	68	23	8	7	21	6	10	34.6	Female
624	88	42	12	3	2	10	6	16	33.2	Female
625	69	70	17	5	4	15	3	4	32	Female
626	85	63	18	5	4	16	3	5	47.1	Female
627	77	51	12	3	2	10	6	4	47.3	Female
628	78	80	17	5	4	15	3	4	47.6	Female
629	80	72	24	8	7	22	6	11	48	Female
630	85	60	12	3	2	10	6	16	48.2	Female
631	83	60	15	4	3	13	2	12	48.3	Female
632	75	65	13	3	2	11	6	15	49.1	Female
633	82	68	19	6	5	17	4	6	49.5	Female
634	70	53	16	5	4	14	3	12	50.2	Female
635	75	53	16	5	4	14	3	12	51.3	Female
636	65	61	17	5	4	15	3	4	51.3	Female
637	86	67	13	3	2	11	6	15	64.7	Female
638	95	69	18	5	4	16	3	5	67	Female
639	90	76	23	8	7	21	6	9	68.3	Female
640	82	41	14	4	3	12	2	14	60.7	Female
641	79	64	18	6	5	16	4	5	69.3	Female

642	77	65	19	6	5	17	4	6	79	Female
643	82	64	15	4	3	13	2	13	45.3	Female
644	73	68	17	5	4	15	3	4	68	Female
645	82	68	16	5	4	14	3	12	75.3	Female
646	94	79	17	5	4	15	3	4	65.3	Female
647	86	65	21	7	6	19	5	8	78.3	Female
648	81	47	18	6	5	16	4	5	83.7	Female
649	82	64	14	4	3	12	2	13	64	Female
650	87	68	16	5	4	14	3	12	91	Female
651	82	64	15	4	3	13	2	13	78.3	Female
652	73	68	17	5	4	15	3	4	30.6	Female
653	82	68	16	5	4	14	3	12	86	Female
654	94	79	17	5	4	15	3	4	64.3	Female
655	86	65	21	7	6	19	5	8	62.3	Female
656	81	47	18	6	5	16	4	5	74.3	Female
657	82	64	14	4	3	12	2	13	69.7	Female
658	87	68	16	5	4	14	3	12	68.7	Female
659	73	86	15	4	3	13	2	12	73.3	Female
660	75	82	23	8	7	21	6	10	76.7	Female
661	82	77	18	5	4	16	3	5	64.7	Female
662	91	68	23	8	7	21	6	10	68.3	Female
663	88	42	12	3	2	10	6	16	79	Female
664	69	70	17	5	4	15	3	4	45	Female
665	85	63	18	5	4	16	3	5	54	Female
666	77	51	12	3	2	10	6	4	41.3	Female
667	78	80	17	5	4	15	3	4	45.3	Female
668	80	72	24	8	7	22	6	11	50	Female
669	85	60	12	3	2	10	6	16	70	Female

670	83	60	15	4	3	13	2	12	61.5	Female
671	75	65	13	3	2	11	6	14	46.6	Female
672	82	68	19	6	5	17	4	6	67.3	Female
673	70	53	16	5	4	14	3	12	57.3	Female
674	75	53	16	5	4	14	3	12	55.7	Female
675	65	61	17	5	4	15	3	4	51.3	Female
676	86	67	13	3	2	11	6	14	67	Female
677	95	69	18	5	4	16	3	5	66.7	Female
678	90	76	23	8	7	21	6	9	69.3	Female
679	82	41	14	4	3	12	2	14	43.3	Female
680	79	64	18	6	5	16	4	5	66.7	Female
681	77	65	19	6	5	17	4	6	77.3	Female
682	82	64	15	4	3	13	2	13	31.7	Female
683	73	68	17	5	4	15	3	4	67.3	Female
684	82	68	16	5	4	14	3	12	56.5	Female
685	94	79	17	5	4	15	3	4	67	Female
686	86	65	21	7	6	19	5	8	63.7	Female
687	81	47	18	6	5	16	4	5	70.7	Female
688	82	64	14	4	3	12	2	13	76.6	Female
689	87	68	16	5	4	14	3	12	63	Female
690	73	86	15	4	3	13	2	12	76.3	Female
691	75	82	23	8	7	21	6	10	61.3	Female
692	82	77	18	5	4	16	3	5	58.7	Female
693	91	68	23	8	7	21	6	10	46.7	Female
694	88	42	12	3	2	10	6	16	48.3	Female
695	69	70	17	5	4	15	3	4	65.3	Female
696	85	63	18	5	4	16	3	5	41	Female
697	77	51	12	3	2	10	6	4	50	Female

698	78	80	17	5	4	15	3	4	53.7	Female
699	80	72	24	8	7	22	6	11	34.3	Female
700	85	60	12	3	2	10	6	16	47.3	Female
701	83	60	15	4	3	13	2	12	40.7	Female
702	75	65	13	3	2	11	6	14	51.7	Female
703	82	68	19	6	5	17	4	6	52	Female
704	70	53	16	5	4	14	3	12	66	Female
705	75	53	16	5	4	14	3	12	55	Female
706	65	61	17	5	4	15	3	4	39.8	Female
707	86	67	13	3	2	11	6	14	40.3	Female
708	95	69	18	5	4	16	3	5	59	Female
709	90	76	23	8	7	21	6	9	56	Female
710	82	41	14	4	3	12	2	14	36	Female
711	79	64	18	6	5	16	4	5	67	Female
712	77	65	19	6	5	17	4	6	44.8	Female
713	82	64	15	4	3	13	2	13	46.9	Female
714	73	68	17	5	4	15	3	4	42.3	Female
715	82	68	16	5	4	14	3	12	47.8	Female
716	94	79	17	5	4	15	3	4	43.3	Female
717	86	65	21	7	6	19	5	8	47.5	Female
718	81	47	18	6	5	16	4	5	56.4	Female
719	82	64	14	4	3	12	2	13	57.1	Female
720	87	68	16	5	4	14	3	12	58.1	Female
721	73	86	15	4	3	13	2	12	46.3	Female
722	75	82	23	8	7	21	6	10	49.6	Female
723	82	77	18	5	4	16	3	5	46.3	Female
724	91	68	23	8	7	21	6	10	60	Female
725	88	42	12	3	2	10	6	16	66	Female

726	69	70	17	5	4	15	3	4	62.2	Female
727	85	63	18	5	4	16	3	5	56.3	Female
728	77	51	12	3	2	10	6	4	62	Female
729	78	80	17	5	4	15	3	4	50	Female
730	80	72	24	8	7	22	6	11	60.1	Female
731	85	60	12	3	2	10	6	16	50.1	Female
732	83	60	15	4	3	13	2	12	58.1	Female
733	75	65	13	3	2	11	6	14	55.2	Female
734	82	68	19	6	5	17	4	6	52.7	Female
735	70	53	16	5	4	14	3	12	51.8	Female
736	75	53	16	5	4	14	3	12	57.7	Female
737	65	61	17	5	4	15	3	4	51.6	Female
738	86	67	13	3	2	11	6	14	51.6	Female
739	95	69	18	5	4	16	3	5	51.4	Female
740	90	76	23	8	7	21	6	9	49	Female
741	82	41	14	4	3	12	2	14	46.7	Female
742	79	64	18	6	5	16	4	5	58.1	Female
743	77	65	19	6	5	17	4	6	55.2	Female
744	82	64	15	4	3	13	2	13	52.7	Female
745	73	68	17	5	4	15	3	4	51.8	Female
746	82	68	16	5	4	14	3	12	57.7	Female
747	94	79	17	5	4	15	3	4	51.6	Female
748	86	65	21	7	6	19	5	8	51.6	Female
749	81	47	18	6	5	16	4	5	51.4	Female
750	82	64	14	4	3	12	2	13	49	Female
751	87	68	16	5	4	14	3	12	46.7	Female
752	82	64	15	4	3	13	2	13	44.7	Female
753	73	68	17	5	4	15	3	4	49.7	Female

754	82	68	16	5	4	14	3	12	44	Female
755	94	79	17	5	4	15	3	4	51	Female
756	86	65	21	7	6	19	5	8	47.3	Female
757	81	47	18	6	5	16	4	5	64	Female
758	82	64	14	4	3	12	2	13	60	Female
759	87	68	16	5	4	14	3	12	49.3	Female
760	73	86	15	4	3	13	2	12	53.7	Female
761	75	82	23	8	7	21	6	10	69	Female
762	82	77	18	5	4	16	3	5	57.7	Female
763	91	68	23	8	7	21	6	10	83	Female
764	88	42	12	3	2	10	6	16	54.7	Female
765	69	70	17	5	4	15	3	4	47.7	Female
766	85	63	18	5	4	16	3	5	56.7	Female
767	77	51	12	3	2	10	6	16	60	Female
768	78	80	17	5	4	15	3	4	49.3	Female
769	80	72	24	8	7	22	6	11	68	Female
770	85	60	12	3	2	10	6	16	51.3	Female
771	83	60	15	4	3	13	2	4	59.9	Female
772	75	65	13	3	2	11	6	14	56.7	Female
773	82	68	19	6	5	17	4	6	50.7	Female
774	70	53	16	5	4	14	3	4	57.7	Female
775	75	53	16	5	4	14	3	4	56.7	Female
776	65	61	17	5	4	15	3	4	57.7	Female
777	86	67	13	3	2	11	6	14	51.3	Female
778	95	69	18	5	4	16	3	5	51.3	Female
779	90	76	23	8	7	21	6	9	64.7	Female
780	82	41	14	4	3	12	2	14	67	Female
781	79	64	18	6	5	16	4	5	63	Female

782	77	65	19	6	5	17	4	6	76.3	Female
783	82	64	15	4	3	13	2	13	61.3	Female
784	73	68	17	5	4	15	3	4	58.7	Female
785	82	68	16	5	4	14	3	4	46.7	Female
786	94	79	17	5	4	15	3	4	48.3	Female
787	86	65	21	7	6	19	5	8	65.3	Female
788	81	47	18	6	5	16	4	5	41	Female
789	82	64	14	4	3	12	2	13	50	Female
790	87	68	16	5	4	14	3	4	53.7	Female
791	73	86	15	4	3	13	2	4	34.3	Female
792	75	82	23	8	7	21	6	10	47.3	Female
793	82	77	18	5	4	16	3	5	40.7	Female
794	91	68	23	8	7	21	6	10	51.7	Female
795	88	42	12	3	2	10	6	16	52.3	Female
796	69	70	17	5	4	15	3	4	66	Female
797	85	63	18	5	4	16	3	5	55	Female
798	77	51	12	3	2	10	6	16	39.7	Female
799	78	80	17	5	4	15	3	4	30.6	Female
800	80	72	24	8	7	22	6	11	59	Female
801	85	60	12	3	2	10	6	16	56	Female
802	83	60	15	4	3	13	2	4	36.7	Female
803	75	65	13	3	2	11	6	14	67	Female
804	82	68	19	6	5	17	4	6	44.2	Female
805	70	53	16	5	4	14	3	4	46.2	Female
806	75	53	16	5	4	14	3	4	43.2	Female
807	65	61	17	5	4	15	3	4	37.5	Female
808	86	67	13	3	2	11	6	14	34.6	Female
809	95	69	18	5	4	16	3	5	37.6	Female

810	90	76	23	8	7	21	6	9	37.8	Female
811	82	41	14	4	3	12	2	14	32	Female
812	79	64	18	6	5	16	4	5	36.7	Female
813	77	65	19	6	5	17	4	6	36.8	Female
814	82	64	15	4	3	13	2	13	39.5	Female
815	73	68	17	5	4	15	3	4	36.7	Female
816	82	68	16	5	4	14	3	4	60	Female
817	94	79	17	5	4	15	3	4	66	Female
818	86	65	21	7	6	19	5	8	62.2	Female
819	81	47	18	6	5	16	4	5	56.3	Female
820	82	64	14	4	3	12	2	13	62	Female
821	87	68	16	5	4	14	3	4	50	Female
822	73	86	15	4	3	13	2	4	60.1	Female
823	75	82	23	8	7	21	6	10	50.1	Female
824	82	77	18	5	4	16	3	5	58.1	Female
825	91	68	23	8	7	21	6	10	63	Female
826	88	42	12	3	2	10	5	16	76.3	Female
827	69	70	17	5	4	15	3	4	61.3	Female
828	85	63	18	5	4	16	3	5	58.7	Female
829	77	51	12	3	2	10	5	16	46.7	Female
830	78	80	17	5	4	15	3	4	48.3	Female
831	80	72	24	8	7	22	6	11	65.3	Female
832	85	60	12	3	2	10	5	16	41	Female
833	83	60	15	4	3	13	2	4	50	Female
834	75	65	13	3	2	11	5	14	53.7	Female
835	82	68	19	6	5	17	4	6	34.3	Female
836	70	53	16	5	4	14	3	4	47.3	Female
837	75	53	16	5	4	14	3	4	40.7	Female

838	65	61	17	5	4	15	3	4	51.7	Female
839	86	67	13	3	2	11	5	14	52.3	Female
840	95	69	18	5	4	16	3	5	66.1	Female
841	90	76	23	8	7	21	6	9	55.2	Female
842	82	41	14	4	3	12	2	14	29.8	Female
843	79	64	18	6	5	16	4	5	30.4	Female
844	77	65	19	6	5	17	4	6	59.1	Female
845	82	64	15	4	3	13	2	13	56.7	Female
846	73	68	17	5	4	15	3	4	46.5	Female
847	82	68	16	5	4	14	3	4	67	Female
848	94	79	17	5	4	15	3	4	24	Female
849	86	65	21	7	6	19	5	8	26.4	Female
850	81	47	18	6	5	16	4	5	32.2	Female
851	82	64	14	4	3	12	2	13	27.6	Female
852	87	68	16	5	4	14	3	4	34.5	Female
853	82	64	15	4	3	13	2	13	37.8	Female
854	73	68	17	5	4	15	3	4	37.5	Female
855	82	68	16	5	4	14	3	4	32.4	Female
856	94	79	17	5	4	15	3	4	36.5	Female
857	86	65	21	7	6	19	5	8	36.8	Female
858	81	47	18	6	5	16	4	5	39.2	Female
859	82	64	14	4	3	12	2	13	36.4	Female
860	87	68	16	5	4	14	3	4	60.2	Female
861	73	86	15	4	3	13	2	4	66	Female
862	75	82	23	8	7	21	6	10	62.2	Female
863	82	77	18	5	4	16	3	5	56.3	Female
864	91	68	23	8	7	21	6	10	62	Female
865	88	42	12	3	2	10	5	16	50	Female

866	69	70	17	5	4	15	3	4	60.1	Female
867	85	63	18	5	4	16	3	5	50.1	Female
868	77	51	12	3	2	10	5	16	58.1	Female
869	78	80	17	5	4	15	3	4	45.3	Female

NOTE: For Success, AS: Attribution to self-effort; AL: Attribution to luck, AT: Attribution to teacher. For Failure, BS: Attribution to self-effort; BL: Attribution to luck, BT: Attribution to teacher.

APPENDIX K
ANALYSIS: SPSS RESULTS PRINT OUT

Frequency Table

MJSES				
	Frequency	Percent	Valid Percent	Cumulative Percent
65.00	26	3.0	3.0	3.0
66.00	1	.1	.1	3.1
69.00	27	3.1	3.1	6.2
70.00	26	3.0	3.0	9.2
73.00	59	6.8	6.8	16.0
74.00	1	.1	.1	16.1
75.00	79	9.1	9.1	25.2
77.00	54	6.2	6.2	31.4
78.00	27	3.1	3.1	34.5
79.00	26	3.0	3.0	37.5
80.00	28	3.2	3.2	40.7
Valid 81.00	32	3.7	3.7	44.4
82.00	175	20.1	20.1	64.6
83.00	26	3.0	3.0	67.5
85.00	54	6.2	6.2	73.8
86.00	58	6.7	6.7	80.4
87.00	32	3.7	3.7	84.1
88.00	27	3.1	3.1	87.2
90.00	26	3.0	3.0	90.2
91.00	27	3.1	3.1	93.3
94.00	32	3.7	3.7	97.0
95.00	26	3.0	3.0	100.0
Total	869	100.0	100.0	

TAS

	Frequency	Percent	Valid Percent	Cumulative Percent
41.00	26	3.0	3.0	3.0
42.00	27	3.1	3.1	6.1
47.00	32	3.7	3.7	9.8
51.00	27	3.1	3.1	12.9
53.00	52	6.0	6.0	18.9
60.00	52	6.0	6.0	24.9
61.00	27	3.1	3.1	28.0
63.00	27	3.1	3.1	31.1
64.00	91	10.5	10.5	41.5
65.00	84	9.7	9.7	51.2
67.00	27	3.1	3.1	54.3
Valid 68.00	150	17.3	17.3	71.6
69.00	26	3.0	3.0	74.6
70.00	27	3.1	3.1	77.7
72.00	26	3.0	3.0	80.7
76.00	26	3.0	3.0	83.7
77.00	28	3.2	3.2	86.9
79.00	33	3.8	3.8	90.7
80.00	27	3.1	3.1	93.8
82.00	27	3.1	3.1	96.9
86.00	27	3.1	3.1	100.0
Total	869	100.0	100.0	

AS

	Frequency	Percent	Valid Percent	Cumulative Percent
12.00	80	9.2	9.2	9.2
13.00	53	6.1	6.1	15.3
14.00	58	6.7	6.7	22.0
15.00	87	10.0	10.0	32.0
Valid 16.00	118	13.6	13.6	45.6
17.00	144	16.6	16.6	62.1
18.00	138	15.9	15.9	78.0
19.00	53	6.1	6.1	84.1
21.00	32	3.7	3.7	87.8

23.00	80	9.2	9.2	97.0
24.00	26	3.0	3.0	100.0
Total	869	100.0	100.0	

AL

	Frequency	Percent	Valid Percent	Cumulative Percent
3.00	133	15.3	15.3	15.3
4.00	145	16.7	16.7	32.0
5.00	342	39.4	39.4	71.3
Valid 6.00	111	12.8	12.8	84.1
7.00	32	3.7	3.7	87.8
8.00	106	12.2	12.2	100.0
Total	869	100.0	100.0	

AT

	Frequency	Percent	Valid Percent	Cumulative Percent
2.00	133	15.3	15.3	15.3
3.00	145	16.7	16.7	32.0
4.00	342	39.4	39.4	71.3
Valid 5.00	111	12.8	12.8	84.1
6.00	32	3.7	3.7	87.8
7.00	106	12.2	12.2	100.0
Total	869	100.0	100.0	

BL

	Frequency	Percent	Valid Percent	Cumulative Percent
2.00	140	16.1	16.1	16.1
3.00	342	39.4	39.4	55.5
4.00	111	12.8	12.8	68.2
Valid 5.00	43	4.9	4.9	73.2
6.00	173	19.9	19.9	93.1
7.00	46	5.3	5.3	98.4
8.00	14	1.6	1.6	100.0
Total	869	100.0	100.0	

BT

	Frequency	Percent	Valid Percent	Cumulative Percent
4.00	186	21.4	21.4	21.4
5.00	138	15.9	15.9	37.3
6.00	53	6.1	6.1	43.4
8.00	32	3.7	3.7	47.1
9.00	26	3.0	3.0	50.1
10.00	54	6.2	6.2	56.3
Valid 11.00	26	3.0	3.0	59.3
12.00	63	7.2	7.2	66.5
13.00	120	13.8	13.8	80.3
14.00	53	6.1	6.1	86.4
15.00	29	3.3	3.3	89.8
16.00	89	10.2	10.2	100.0
Total	869	100.0	100.0	

CAS

	Frequency	Percent	Valid Percent	Cumulative Percent
20.00	2	.2	.2	.2
24.00	1	.1	.1	.3
26.40	1	.1	.1	.5
27.60	1	.1	.1	.6
29.00	2	.2	.2	.8
29.80	1	.1	.1	.9
30.40	1	.1	.1	1.0
30.60	5	.6	.6	1.6
Valid 31.70	7	.8	.8	2.4
32.00	6	.7	.7	3.1
32.20	1	.1	.1	3.2
32.40	1	.1	.1	3.3
33.20	5	.6	.6	3.9
33.40	1	.1	.1	4.0
34.30	8	.9	.9	4.9
34.50	2	.2	.2	5.2
34.60	6	.7	.7	5.9
35.00	5	.6	.6	6.4

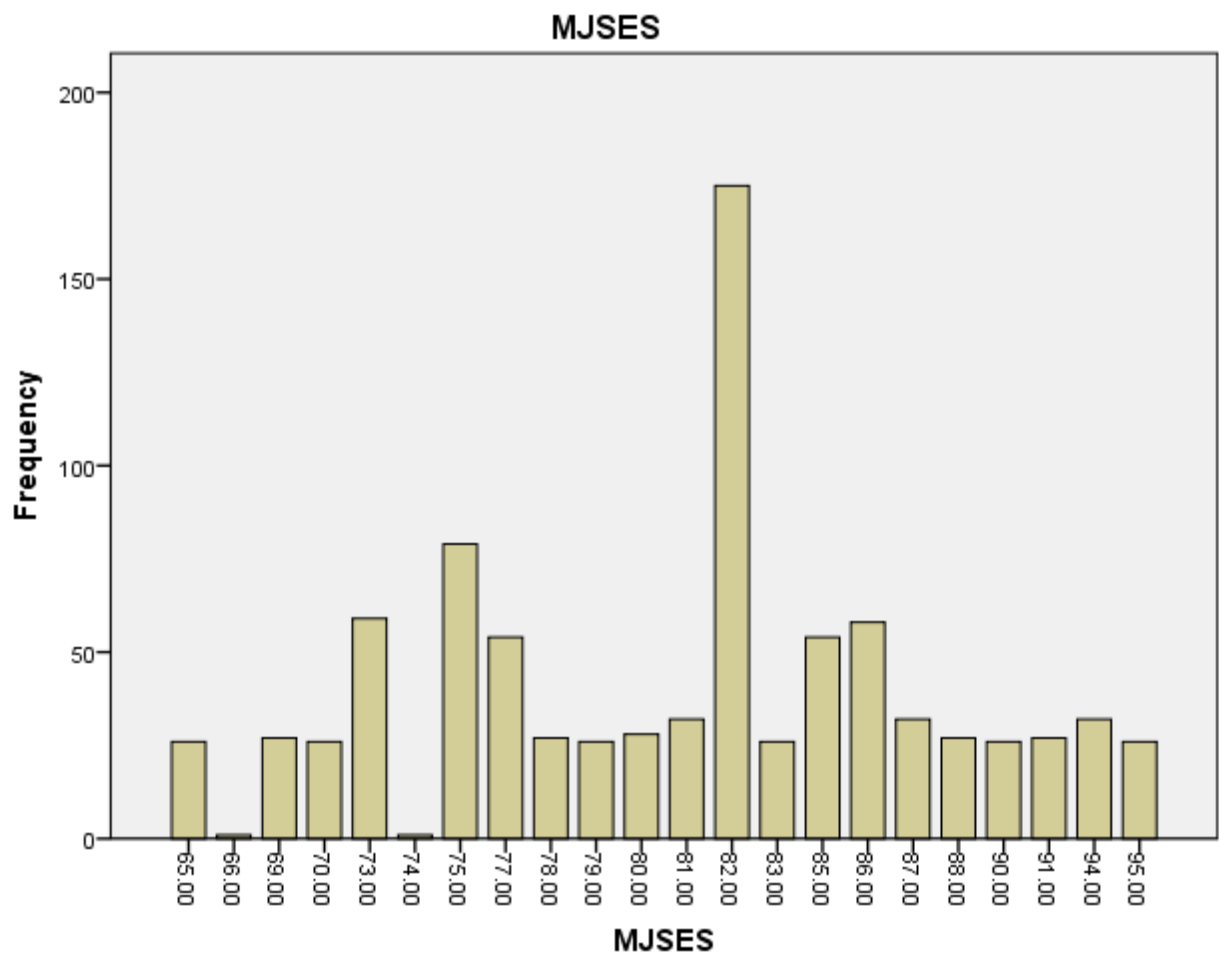
35.40	5	.6	.6	7.0
35.50	5	.6	.6	7.6
35.80	5	.6	.6	8.2
36.00	3	.3	.3	8.5
36.40	6	.7	.7	9.2
36.50	2	.2	.2	9.4
36.70	3	.3	.3	9.8
36.80	2	.2	.2	10.0
37.10	1	.1	.1	10.1
37.40	1	.1	.1	10.2
37.50	3	.3	.3	10.6
37.60	4	.5	.5	11.0
37.80	3	.3	.3	11.4
38.60	5	.6	.6	12.0
38.70	1	.1	.1	12.1
39.00	4	.5	.5	12.5
39.20	1	.1	.1	12.7
39.40	1	.1	.1	12.8
39.50	1	.1	.1	12.9
39.70	1	.1	.1	13.0
39.80	2	.2	.2	13.2
40.20	4	.5	.5	13.7
40.30	2	.2	.2	13.9
40.70	8	.9	.9	14.8
41.00	7	.8	.8	15.7
41.30	6	.7	.7	16.3
41.50	1	.1	.1	16.5
42.30	1	.1	.1	16.6
43.20	9	1.0	1.0	17.6
43.30	11	1.3	1.3	18.9
44.00	3	.3	.3	19.2
44.20	3	.3	.3	19.6
44.70	3	.3	.3	19.9
44.80	1	.1	.1	20.0
45.00	8	.9	.9	20.9
45.20	1	.1	.1	21.1
45.30	11	1.3	1.3	22.3
45.60	2	.2	.2	22.6
45.90	5	.6	.6	23.1

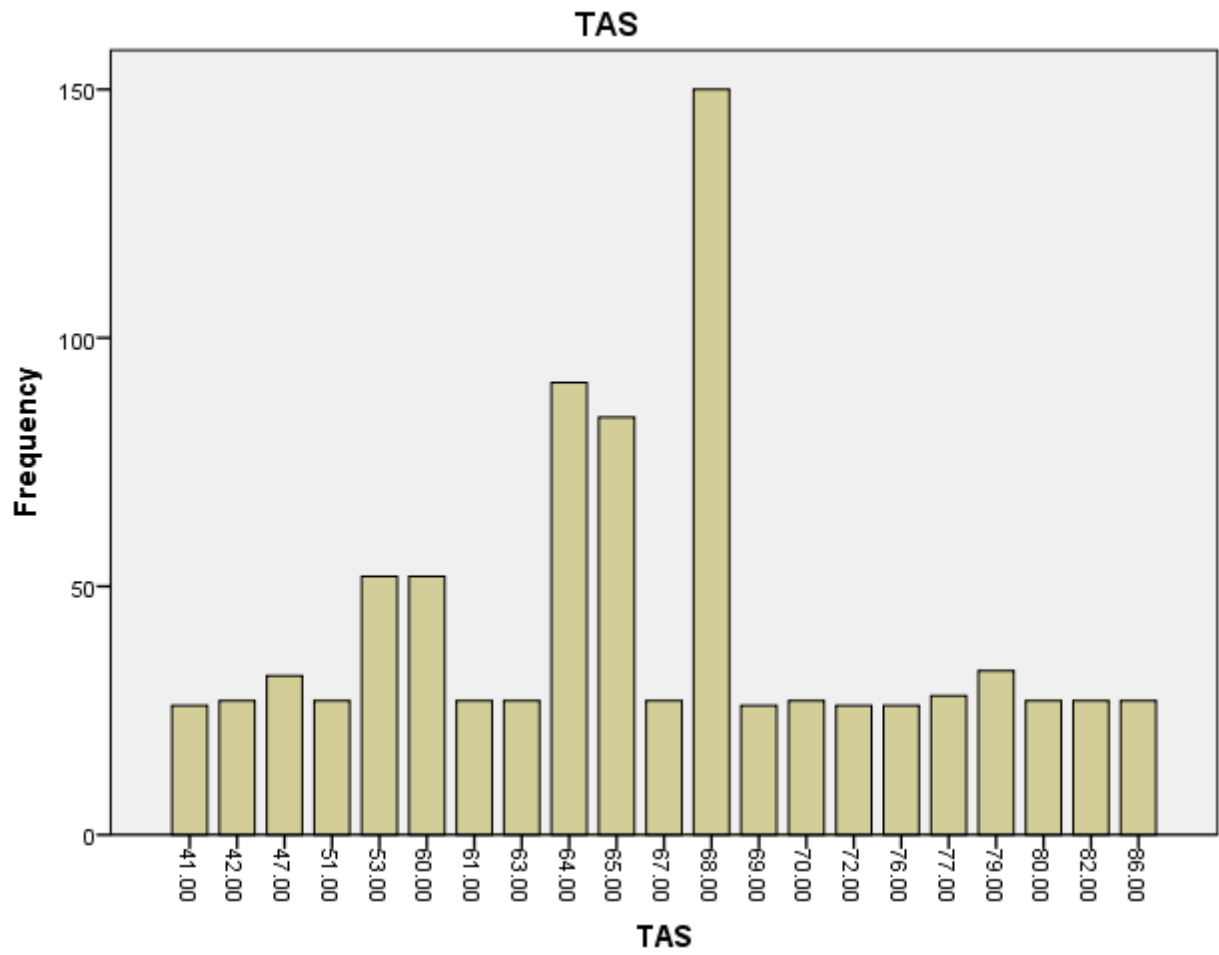
46.10	1	.1	.1	23.2
46.20	1	.1	.1	23.4
46.30	5	.6	.6	23.9
46.40	1	.1	.1	24.1
46.50	2	.2	.2	24.3
46.60	6	.7	.7	25.0
46.70	17	2.0	2.0	26.9
46.80	1	.1	.1	27.0
46.90	1	.1	.1	27.2
47.10	5	.6	.6	27.7
47.30	17	2.0	2.0	29.7
47.50	1	.1	.1	29.8
47.60	5	.6	.6	30.4
47.70	3	.3	.3	30.7
47.80	1	.1	.1	30.8
48.00	5	.6	.6	31.4
48.20	5	.6	.6	32.0
48.30	14	1.6	1.6	33.6
48.90	1	.1	.1	33.7
49.00	7	.8	.8	34.5
49.10	4	.5	.5	35.0
49.30	7	.8	.8	35.8
49.50	4	.5	.5	36.2
49.60	1	.1	.1	36.4
49.70	3	.3	.3	36.7
50.00	22	2.5	2.5	39.2
50.10	9	1.0	1.0	40.3
50.20	7	.8	.8	41.1
50.60	2	.2	.2	41.3
50.70	3	.3	.3	41.7
50.80	2	.2	.2	41.9
51.00	3	.3	.3	42.2
51.30	20	2.3	2.3	44.5
51.40	7	.8	.8	45.3
51.60	16	1.8	1.8	47.2
51.70	8	.9	.9	48.1
51.80	7	.8	.8	48.9
52.00	6	.7	.7	49.6
52.10	1	.1	.1	49.7

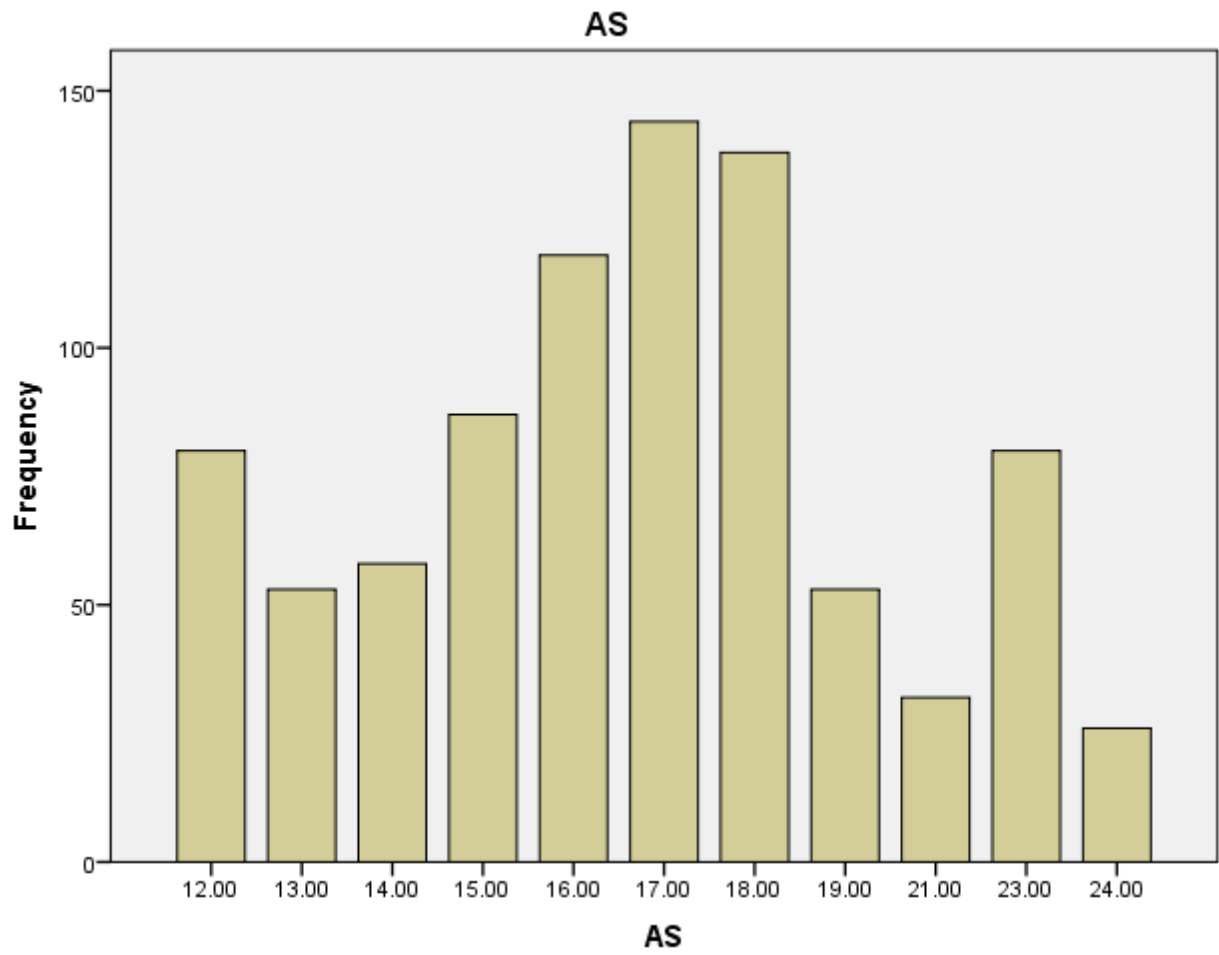
52.30	4	.5	.5	50.2
52.40	1	.1	.1	50.3
52.70	7	.8	.8	51.1
53.70	11	1.3	1.3	52.4
54.00	6	.7	.7	53.0
54.70	4	.5	.5	53.5
55.00	7	.8	.8	54.3
55.20	8	.9	.9	55.2
55.70	7	.8	.8	56.0
56.00	5	.6	.6	56.6
56.10	1	.1	.1	56.7
56.30	9	1.0	1.0	57.8
56.40	1	.1	.1	57.9
56.50	7	.8	.8	58.7
56.70	13	1.5	1.5	60.2
56.80	1	.1	.1	60.3
57.10	1	.1	.1	60.4
57.30	6	.7	.7	61.1
57.70	16	1.8	1.8	62.9
58.00	1	.1	.1	63.1
58.10	10	1.2	1.2	64.2
58.70	9	1.0	1.0	65.2
59.00	4	.5	.5	65.7
59.10	2	.2	.2	65.9
59.20	1	.1	.1	66.1
59.90	3	.3	.3	66.4
60.00	11	1.3	1.3	67.7
60.10	8	.9	.9	68.6
60.20	1	.1	.1	68.7
60.70	5	.6	.6	69.3
61.30	9	1.0	1.0	70.3
61.50	6	.7	.7	71.0
62.00	8	.9	.9	71.9
62.20	7	.8	.8	72.7
62.30	4	.5	.5	73.2
63.00	9	1.0	1.0	74.2
63.70	7	.8	.8	75.0
64.00	7	.8	.8	75.8
64.30	4	.5	.5	76.3

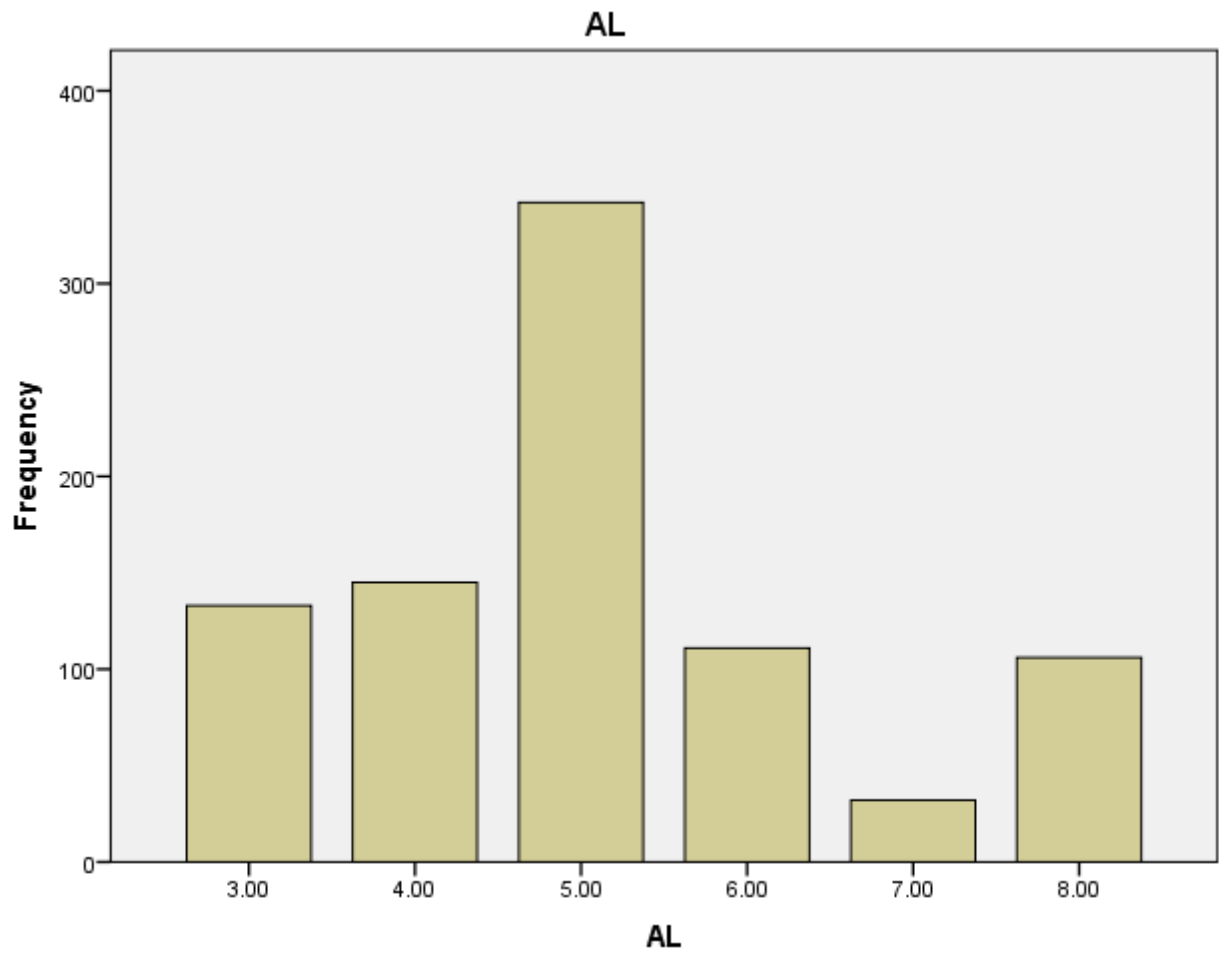
64.70	9	1.0	1.0	77.3
65.30	13	1.5	1.5	78.8
66.00	14	1.6	1.6	80.4
66.10	1	.1	.1	80.6
66.70	12	1.4	1.4	81.9
67.00	24	2.8	2.8	84.7
67.30	15	1.7	1.7	86.4
67.80	1	.1	.1	86.5
68.00	7	.8	.8	87.3
68.30	8	.9	.9	88.3
68.70	4	.5	.5	88.7
69.00	3	.3	.3	89.1
69.30	10	1.2	1.2	90.2
69.70	4	.5	.5	90.7
70.00	6	.7	.7	91.4
70.70	7	.8	.8	92.2
71.20	1	.1	.1	92.3
73.30	4	.5	.5	92.8
74.30	4	.5	.5	93.2
75.30	4	.5	.5	93.7
76.30	9	1.0	1.0	94.7
76.60	7	.8	.8	95.5
76.70	4	.5	.5	96.0
77.30	5	.6	.6	96.5
78.30	8	.9	.9	97.5
79.00	8	.9	.9	98.4
83.00	3	.3	.3	98.7
83.70	4	.5	.5	99.2
86.00	4	.5	.5	99.7
91.00	3	.3	.3	100.0
Total	869	100.0	100.0	

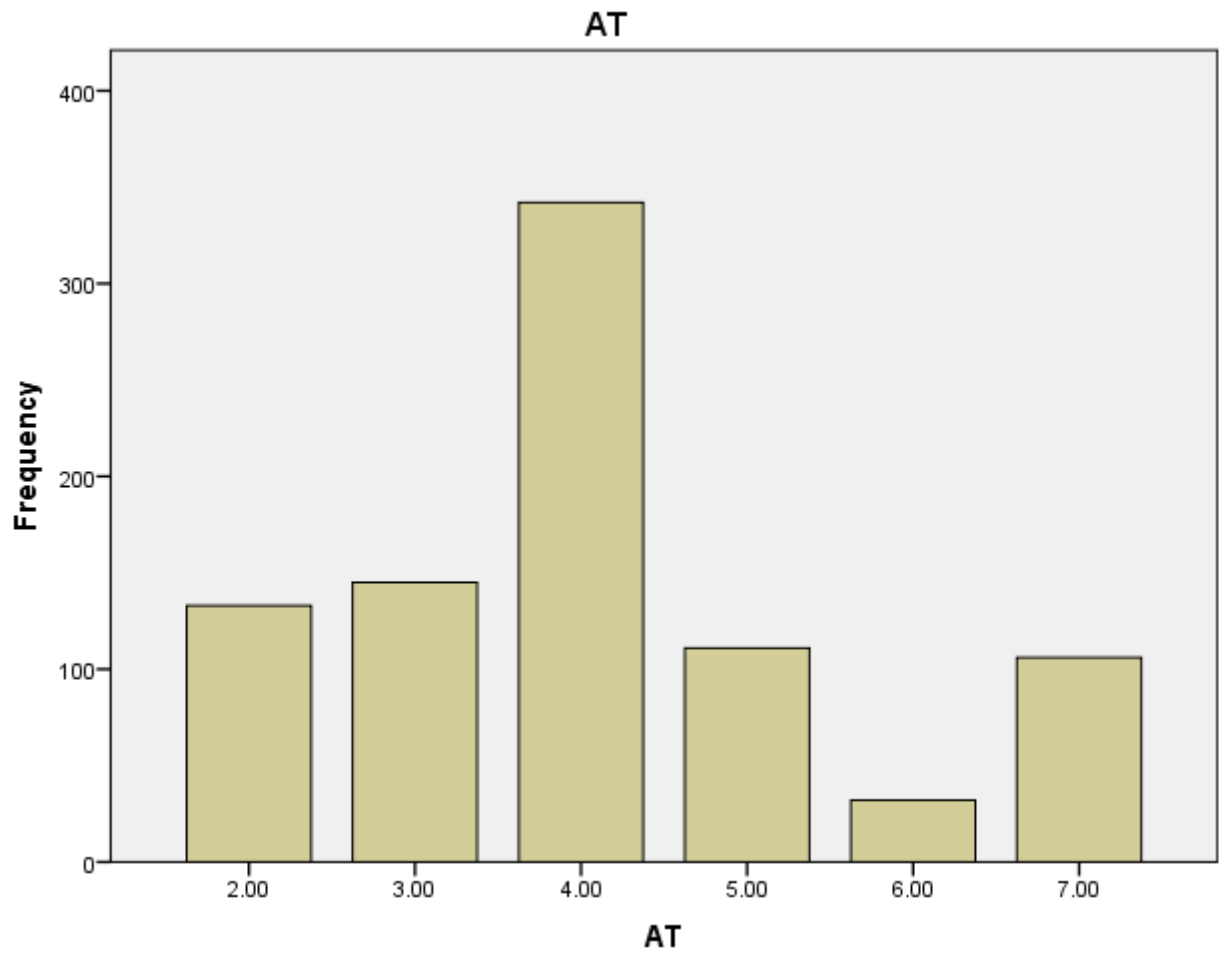
Bar Chart

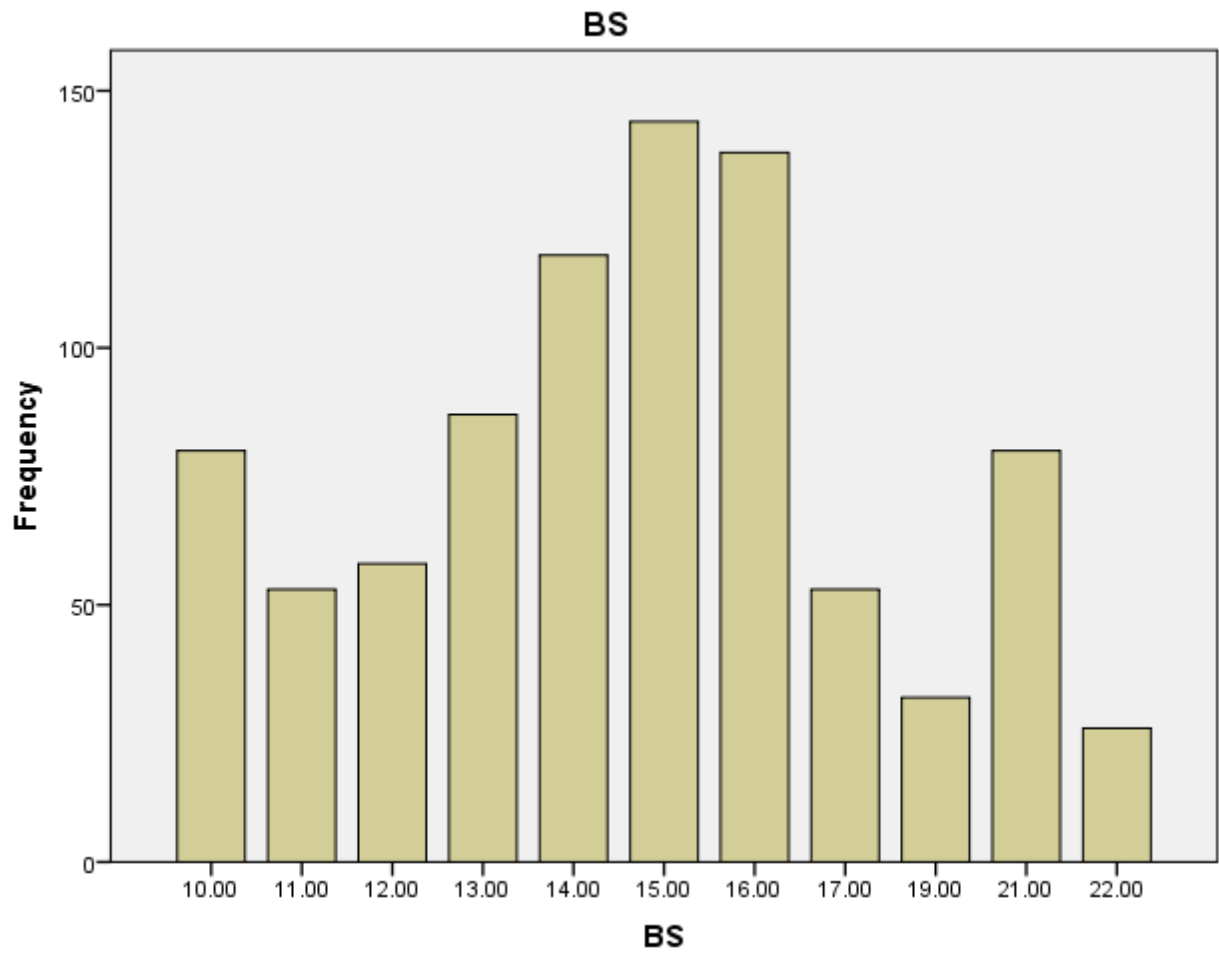


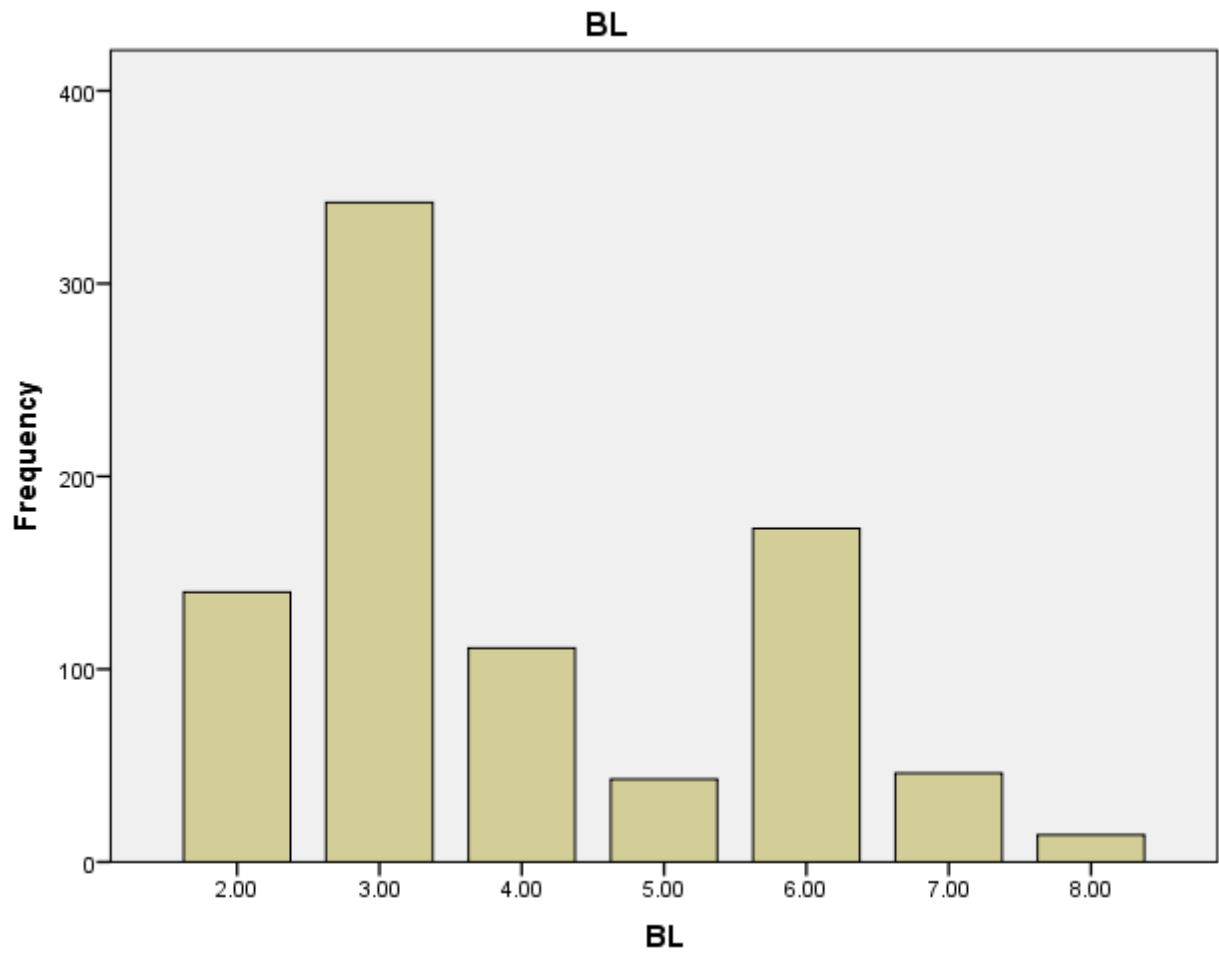


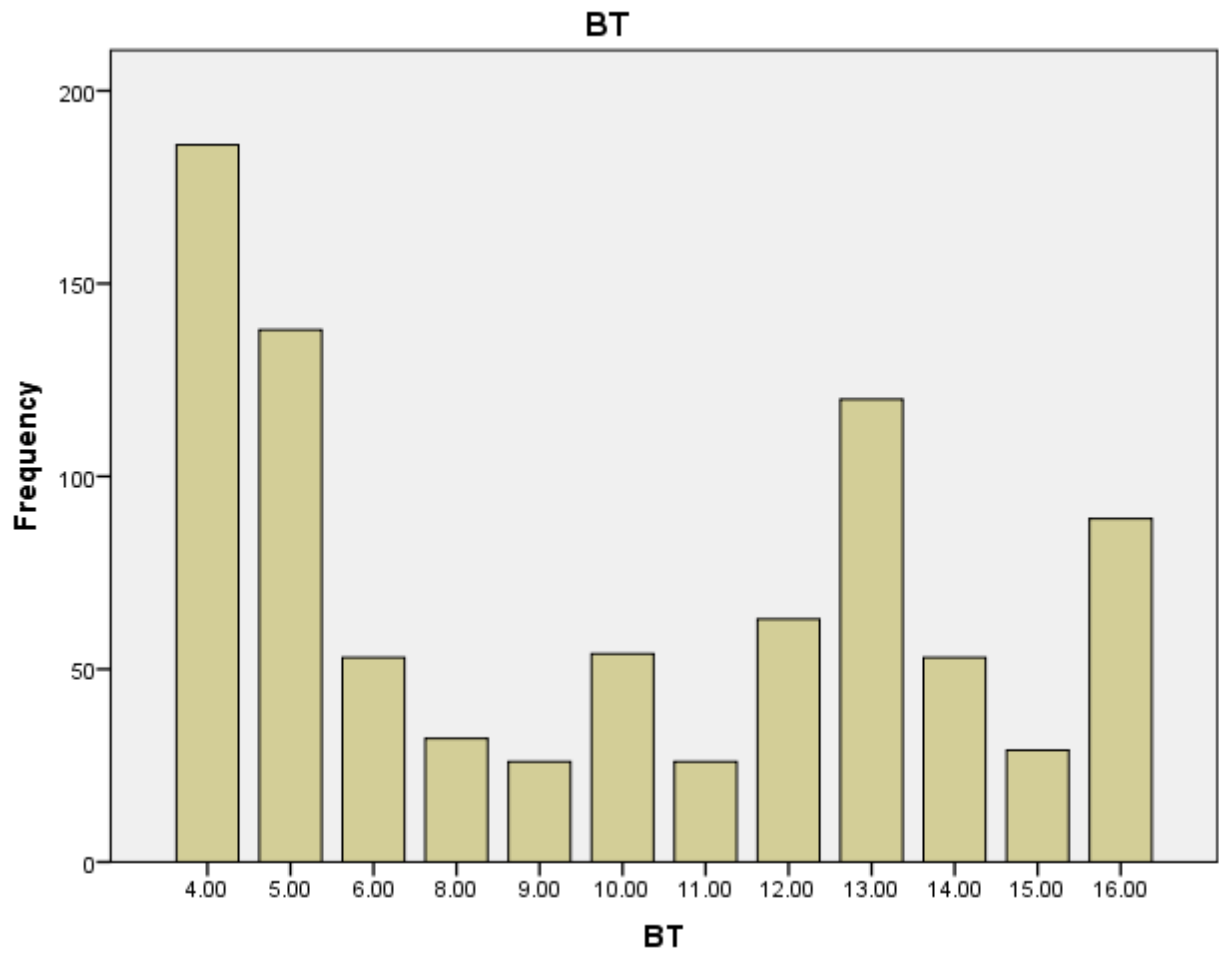


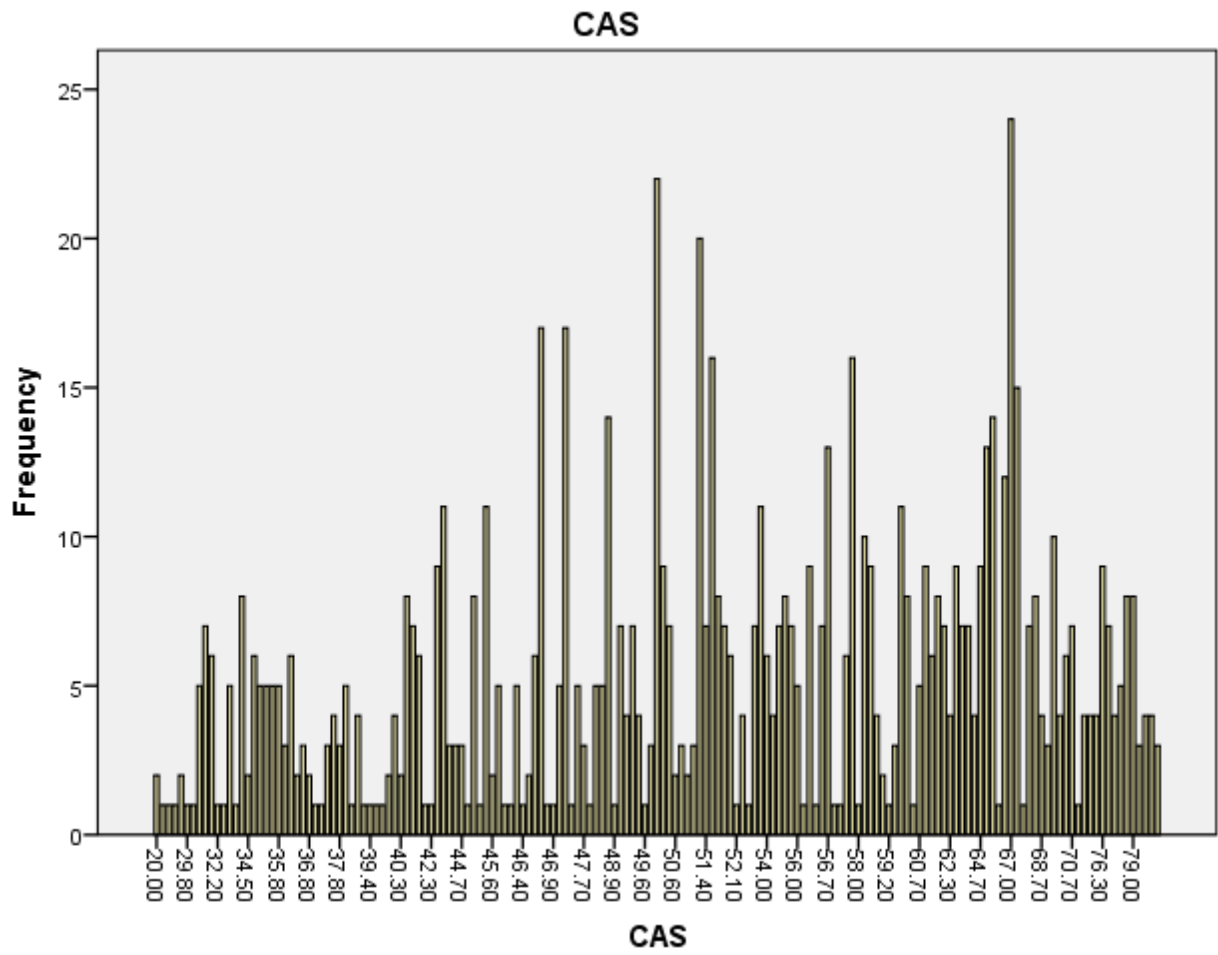












Regression Analysis

General

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Gender, BS, MJSES, BL, TAS, BT, AT ^b		Enter

a. Dependent Variable: CAS

b. Tolerance = .000 limits reached.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.134 ^a	.018	.010	12.38113

a. Predictors: (Constant), Gender, BS, MJSES, BL, TAS, BT, AT

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2395.615	7	342.231	2.233	.030 ^b
	Residual	131984.727	861	153.292		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), Gender, BS, MJSES, BL, TAS, BT, AT

Coefficients^a

Model	General	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	57.614	6.624		8.698	.000
	MJSES	.036	.063	.020	.568	.570
	TAS	.040	.050	.034	.804	.422
	AT	2.422	1.684	.285	1.438	.151
	BS	-1.011	.821	-.259	-1.232	.218
	BL	.151	.280	.020	.540	.589
	BT	.009	.114	.003	.080	.936
	Gender	-2.811	.847	-.113	-3.319	.001

a. Dependent Variable: CAS

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	56.290	4.392		12.817	.000
	AS	-.655	.680	-.168	-.963	.336
	AL	1.794	1.482	.211	1.210	.227

a. Dependent Variable: CAS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.141	1	62.141	.401	.527 ^b
	Residual	134318.200	867	154.923		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), MJSES

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	205.493	1	205.493	1.328	.250 ^b
	Residual	134174.849	867	154.758		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), AS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	288.592	1	288.592	1.866	.172 ^b
	Residual	134091.749	867	154.662		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), AL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	288.592	1	288.592	1.866	.172 ^b
	Residual	134091.749	867	154.662		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), AT

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	205.493	1	205.493	1.328	.250 ^b
	Residual	134174.849	867	154.758		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), BS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	194.938	1	194.938	1.260	.262 ^b
	Residual	134185.404	867	154.770		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), BL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.978	1	19.978	.129	.720 ^b
	Residual	134360.364	867	154.972		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	56.135	1	56.135	.362	.547 ^b
	Residual	134324.207	867	154.930		
	Total	134380.342	868			

a. Dependent Variable: CAS

b. Predictors: (Constant), TAS

Male

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.073 ^a	.005	-.009	12.63036

a. Predictors: (Constant), BT, MJSES, BL, TAS, AT, BS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	351.316	6	58.553	.367	.900 ^b
	Residual	65565.213	411	159.526		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT, MJSES, BL, TAS, AT, BS

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	58.919	9.560		6.163	.000
	MJSES	.065	.092	.036	.704	.482
	TAS	.028	.073	.024	.379	.705
	AT	1.820	2.497	.214	.729	.467
	BS	-1.035	1.221	-.265	-.847	.397
	BL	-.034	.366	-.005	-.093	.926
	BT	-.209	.163	-.075	-1.284	.200

a. Dependent Variable: CAS

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	57.818	6.415		9.013	.000
	AS	-.292	.993	-.075	-.294	.769
	AL	.576	2.163	.068	.266	.790

a. Dependent Variable: CAS

MaleANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	21.716	1	21.716	.137	.711 ^b
	Residual	65894.814	416	158.401		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), MJSES

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.615	1	4.615	.029	.865 ^b
	Residual	65911.915	416	158.442		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), AS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.128	1	2.128	.013	.908 ^b
	Residual	65914.402	416	158.448		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), AL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.128	1	2.128	.013	.908 ^b
	Residual	65914.402	416	158.448		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), AT

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.615	1	4.615	.029	.865 ^b
	Residual	65911.915	416	158.442		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.214	1	16.214	.102	.749 ^b
	Residual	65900.315	416	158.414		
	Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BL

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	142.573	1	142.573	.902	.343 ^b
Residual	65773.957	416	158.110		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1.502	1	1.502	.009	.922 ^b
Residual	65915.028	416	158.450		
Total	65916.530	417			

a. Dependent Variable: CAS

b. Predictors: (Constant), TAS

Female

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.146 ^a	.021	.008	12.12689

a. Predictors: (Constant), BT, MJSES, BL, TAS, AT, BS

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	1430.980	6	238.497	1.622	.139 ^b
Residual	65295.282	444	147.061		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT, MJSES, BL, TAS, AT, BS

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	49.056	8.763		5.598	.000
MJSES	.008	.086	.004	.091	.928
TAS	.059	.068	.051	.866	.387
AT	3.206	2.277	.383	1.408	.160

BS	-1.124	1.105	-.293	-1.016	.310
BL	.299	.444	.036	.674	.501
BT	.221	.161	.077	1.377	.169

a. Dependent Variable: CAS

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	55.119	5.946		9.270	.000
AS	-1.052	.921	-.274	-1.142	.254
AL	3.075	2.009	.368	1.531	.127

a. Dependent Variable: CAS

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	55.723	1	55.723	.375	.540 ^b
Residual	66670.539	449	148.487		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), MJSES

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	496.569	1	496.569	3.366	.067 ^b
Residual	66229.692	449	147.505		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), AS

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	649.404	1	649.404	4.413	.036 ^b
Residual	66076.858	449	147.164		
Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), AL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	649.404	1	649.404	4.413	.036 ^b
	Residual	66076.858	449	147.164		
	Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), AT

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	496.569	1	496.569	3.366	.067 ^b
	Residual	66229.692	449	147.505		
	Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BS

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	446.879	1	446.879	3.027	.083 ^b
	Residual	66279.383	449	147.616		
	Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BL

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	184.557	1	184.557	1.245	.265 ^b
	Residual	66541.705	449	148.200		
	Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), BT

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	82.662	1	82.662	.557	.456 ^b
	Residual	66643.600	449	148.427		
	Total	66726.262	450			

a. Dependent Variable: CAS

b. Predictors: (Constant), TAS

**APPENDIX L
VALIDATOR'S COMMENT**

APPENDIX M
WAEC CHIEF EXAMINER REPORT

