

**ANALYSIS OF PSYCHO-SOCIAL FACTORS OF CLASSROOM
ENVIRONMENT AS A PREDICTOR TO PERFORMANCE OF UPPER
BASIC SCIENCE STUDENTS IN KAURA, KADUNA. NIGERIA**

BY

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M.ED/EDUC/0494/2009-2010
P15EDSC8105

**DEPARTMENT OF SCIENCE EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY
ZARIA, NIGERIA**

FEBRUARY, 2017

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**DISSERTATION SUBMITTED TO THE SCHOOL OF POSTGRADUATE
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**DEPARTMENT OF SCIENCE EDUCATION
FACULTY OF EDUCATION
AHMADU BELLO UNIVERSITY
ZARIA, NIGERIA**

FEBRUARY, 2017

DECLARATION

I declare that the work in this dissertation entitled “Analysis of Psycho-Social Factors of Classroom Environment as a predictor to Performance of Upper Basic Science Students in Kaura, Kaduna Nigeria” has been written by me in the Department of Science Education, Faculty of Education, Ahmadu Bello University, Zaria, under the supervision of Professor Isa A. Usman and Professor J.S. Mari. The information derived from the literature has been duly acknowledged in the text and a list of references provided. No part of this dissertation was previously presented for another degree or diploma at any university elsewhere.

Yohanna Anderson MUTUM

DATE

CERTIFICATION

This dissertation “Analysis of Psycho-Social Factors of Classroom Environment as a predictor to Performance of Upper Basic Science Students in Kaura, Kaduna Nigeria” by Mutum, Yohanna Anderson Registration Number MED/EDUC/0494/09-10 (Readmission No. P15EDSC8105) meets the regulations governing the award of Master’s degree in science education, Ahmadu Bello University, Zaria, and is approved for its contribution to knowledge and literary presentation.

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Dean, School of Postgraduate Studies

Date

DEDICATION

This piece of academic work is dedicated to my parents the Great, Mutum, Bwankhot Nantam and Mariam Mutum, may your souls rest in the bosom of the Lord (Amen).

ACKNOWLEDGEMENTS

Glory, honour and adoration be to Jehovah El-shadai for insight, wisdom and guidance that culminated into the completion of this research work; which is possible through my supervisors, Professor I.A. Usman and Professor J.S. Mari for prompt assistance, criticism, suggestion, leading to the successful completion of this work. God's hand will always be upon them and their families.

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My gratitude goes to the students, principals and teachers of the schools used in this research work. Thank you for your cooperation. My special gratitude goes to Dr.N.N.Shekari for guidance, personally and through constant prayers. I will never forget this.

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To all, I say A big thank you.

ABBREVIATIONS

BSPT	Basic Science Performance Test
PSCI	Psycho-Social Classroom Inventory
WAEC	West Africa Examination Council
FRN	Federal Republic of Nigeria
NECO	National Examination Council
JSS	Junior Secondary School
JSCE	Junior Secondary Certificate Examination
LEI	Learning Environment Inventory
WES	World Environment Scale
CES	Classroom Environment Scale
CTBS	Comprehensive Test of Basic Skills
SPSS	Statistical Package Software System
ISAT	Integrated Science Achievement Test
STAN	Science Teachers Association Of Nigeria
NERDC	Nigerian Educational and Research Development Council
TIG	Teachers Instructional Guide
ANOVA	Analysis of Variance
ANCOVA	Analysis of Covariance
PAT	Physics Achievement Test
SSAT	Social Studies Achievement Test
ABL	Activity-Based Learning
FI	Facility Index
DI	Discrimination Index

USDLEA United States Department of Labour Employment and Training
Administration

PPMCC Pearson Product Moment Correlation Coefficient

ACES Adult Classroom Environment Studies

SES Socio Economic Status

OPERATIONAL DEFINITION OF TERMS

Basic Science– It is science taught in a way that boundaries between Physics, Chemistry and Biology are broken.

Classroom Environment- Classroom environment encompasses a broad range of educational concepts, including the physical setting, the psychological environment created through social contexts, and instructional components related to teacher characteristics and behaviours.

The Physical Environment- Include classroom arrangement, seating, bulletin boards, black and white board displays and the physical climate, lightening and temperature which may affect academic achievement.

Psychological Classroom Environment- A psychological classroom environment is that environment where learning takes place in a quantifiable and perceptible characteristic. Students are engulfed by environmental information specific target. These attract students' interest, choices, support, participation that enhances mutual understanding.

Social Classroom Environment- A social classroom environment generates an intellectual environment where support, respect and collaboration are central. Positive educational environments are necessary to facilitate optimally adaptive student outcomes, including learning, motivation, school adjustment, and achievement.

Psycho-social Factors of Classroom Environment- A classroom where the psychological and social environment exists is that environment where factors like teachers support, peer group interaction, mutual respect and choices on the subject matter are guaranteed. Students and instructors

agreed that teacher support was the most prevalent dimension of the actual classroom environment.

Classroom Cohesiveness- A cohesive classroom refers to the extent in which students are friendly and helpful towards each other and working together.

Classroom Friction- Friction is the amount of tension clash or dissimilar ideas that exists among students and staff.

Classroom Satisfaction- Classroom satisfaction is the extent to which students enjoy a class. A fulfilment of a need or desire.

Classroom Competitiveness- This is a classroom environment whereby rivalry is emphasized and they contest with one another.

Socio-Economic Status- Socio-economic status is both economic and sociological measure of a person's work experience and of an individual or families economic social position in relation to others based on income, education and occupation.

Classroom Difficulty- Classroom difficulty is the extent to which pupils have trouble with the work in the class.

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ABSTRACT

This study was aimed at analyzing the psycho-social factors of classroom environment as a predictor to academic performance in upper basic science students in Kaura, Kaduna State Nigeria. This local government was selected for this study because of the large number of students enrolment. Psycho-social factors are selected for the study because it is an essential dimension of the classroom. Most researchers dwell on class size, availability of infrastructures but not much is done on the psychological and the social environment. The research design is a correlational type. The population consisted of 2510 upper basic science students. A sample of 340 subjects made up of 140 male and 198 female students were selected by purposive random sampling technique. The instruments used for data collection were, Basic Science Performance Test (BSPT) and the Psycho-Social Classroom Inventory (PSCI) with reliability coefficient 0.73 and 0.88 respectively. Two research questions were asked. What is the relationship between the psycho-social factors of classroom environment and academic performance of Upper Basic Science students? Analysis of subjected to Pearson Product-Moment Correlation procedure. The result showed that relationship exists between the psycho-social classroom environment and academic performance of Upper Basic Science students. Two hypotheses were tested in line with the research questions raised. The first hypothesis stated that, there is no significant relationship between the psycho-social factors of the classroom environment and academic performance in upper basic science. The data collected were analysed using the multiple regression approach at a significant level of $P \leq 0.05$. Data analysed revealed that the examined classroom environment psycho-social factors were not significant predictors of students performance. The only exception is friction. Meaning that the factors were not significant predictors to performance. Therefore, the hypothesis was retained. Based on these findings it was recommended that since this study showed significant relationship between psycho-social factors and academic performance in upper basic science a socially and psychologically conducive classroom should be emphasised in the teaching and learning of upper basic science in Nigeria.

CHAPTER ONE

THE PROBLEM

1.1 Introduction

Basic Science previously called Integrated Science came into being through the National Policy on Education (FRN, 2009). The proposed 9:3:4 educational policy which stipulates nine years for Primary Schools, three years for Secondary School and four years for Tertiary institutions. According to the National Policy on Education (FRN, 2009).the Primary School has nine Academic years whereby the primary science was taught. Primary science is now known as lower basic science while the secondary integrated science is now upper basic science.

The decision of the Federal Government to introduce the 9-year Basic Education Programme in the need to attain the Millennium Development Goals, basic science was introduced. Basic Science is intended to build a solid foundation in sciences at Junior Secondary schools level. From different meanings given to Basic Science, a common factor in all the definitions is that, it is expected to be taught as an activity-based and child-centred method. That is, it is science taught in a way that boundaries between Physics, Chemistry and Biology are broken. Olatoye (2009) and Fu (2010)opine that integration, when applied to science courses, means that the course is devised and presented in such a way that students gain the concept of the fundamental unity of science, the commonality of approach to problems of a scientific thought, and are assisted to gain an understanding of the role and function of science in everyday life, and the fast revolving world in which they live.

According to Olatoye (2009), Basic Science is a course that offers the learners experiences which help them to develop an operational understanding of the structure of science that should enrich their lives and make them more responsible citizens in the

society. Fu (2010) on the other hand, sees Basic science as an approach to the teaching of science in which concepts and principles are presented so as to express the fundamental unity of scientific taught and to avoid undue stress on the distinctions between the various scientific fields.

The classroom environment encompasses a broad range of educational settings which include the physical setting, the psychological environment created through social context, and numerous structural components related to teacher, characteristics and behaviour (Okebukola, 2007a). Okebukola (2007b) opine that effective learning is only possible if the classroom environment is organised to provide a stimulation for learning and calls for needs for the study.

Psycho-social classroom environment has been widespread across nearly all sub-specializations of educational psychology (Studivant, 2015). In such studies mentioned three theoretical dimensions in the classroom, the relationship dimensions, personal growth or goal dimensions and system maintenance and change dimensions. The concept comprises dimensions of involvement, affiliation, and teacher support as relationship dimensions, task. Orientation and competition as personal growth or goal orientation dimensions and finally, order, organization and rule clarity as system maintenance and change dimensions. Patrick and Ray (2007) define Environment as the totality of circumstances surrounding an organization or group of organisms. In effect, the environment is an influential factor that could enhance or affect learning irrespective of the individual's intellectual ability or skills. Classroom learning environment therefore is an embodiment of the physical, sociological and psychological conditions of the classrooms.

The physical condition of the classroom include - age of the classroom building, colour of the walls, availability of infrastructures (seats and desks), good

ventilation, good lighting, roofing/ceiling and smooth floor. Studies of physical environment have investigated aspects such as composition, class size and classroom management. (Adesoji & Olatunbosun, 2008), while the social environment can be influenced by the relationship, based on teacher development and school culture (which include clear directives, delegation of responsibility and accountability) and how these affects classroom environment and outcome between students and teachers, students and teaching materials, students and students, teachers and teaching instructional materials. Research on psychological environment to determine interactions of key players in the classroom, namely, students and teachers, have varied greatly and proliferated during the early 21st century (Studivant, 2015). Studies have been particularly concentrated on students classroom participation rates, teachers support, and communications of learning goals, use of instructional materials, teachers attitude, among others.

The psycho-social environment is an umbrella of teachers' presentation in class, cohesiveness, distraction, friction, satisfaction, competitiveness, interests, motivation, anxieties, confusion and the difficulty of the classroom learning activities (Igwebuikie, 2005). These are factors which must be properly handled by teachers to provide challenging environment for science teaching (Patrick, Ray & Kaplan, 2007). Research findings by Anderson (2007) had revealed that in most schools science teachers did not provide intellectually challenging environment for science students. Most often they dominate the science lessons by a method full of information which was stringent and factors which impeded the performance of students of different cognitive characteristics (Chidiebere, 2009). Another reason for this dominance may be that majority of the students are concrete operational and field dependent who require teachers support, peer group interaction, competition, motivation, and cohesion

(Okebukola, 2007a). These are psychosocial factors of classroom environment. Studivant (2015) defines psycho-social classroom environment as an environment where self-concept, self-esteem, teachers support, competition and anxiety exist. There are important factors in the learning process. Olatoye (2009) proposed that the social factors required for conducive classroom environment for science classrooms should differ from that for arts. According to him, Basic Science Classrooms should be seen as investigative while Arts classrooms are Artistic in orientation.

To perform academically means gaining minimum level of proficiency at standardized test. It is to accomplish or gain by effort or do something successfully with an effort and skill. Obeka (2009) and Antecol, Heather, Okkan and Ozbekik (2012) on the other hand maintain that academic performance concerns intellectual skills which lead to satisfactory means of adjustment, social sensitivity, and adequate self-concept. It should be noted that academic performance is based on the degree of intellectual stimulation that the child could receive from a learning situation in which psycho-social factors like peer dynamisms, satisfaction, competition, friction, difficulty and cohesiveness among others, are factors that have to be played. The teacher plays a very crucial role in the development and performance motive of the learner by providing a conducive environment. In this study, performance is to successfully accomplish or gain something especially through skills and hard work. Academic performance should be seen as successful acquisition, understanding of the learning materials determined through the administration of standardized performance test. Students' academic performance in upper basic science can be high, low, or on the average based on the classroom climate. In this study therefore, an investigation was done to find a causal relationship between academic performance and the classroom environment.

1.1.1 Theoretical Framework

The study of classroom environment is an outgrowth of environmental theory. Lewin (1935) in his development of field theory was a forerunner of the social environmental/climate theory. He referred to the environment as a field or niche which contains the person and the psychological environment as it exists for him. Component of the psychological environment include past and present experiences, feelings, the learners character, motivation, cognitive structure, and ways of perceiving. The target of this study was premised on student teachers, and student environment. Therefore, the theories that had to do with the characteristics of these entities as they affect learning would be applicable since the learning of any subject matter depend on the way it is presented to the learner by his or her teacher, the way the learner interacts with the learning experiences presented to him and the environment within which learning takes place. It is, therefore, expected that these entities should be affected by the five psychosocial dimensions, namely, friction, cohesiveness, satisfaction, difficulty and competition.

The study of Maslow (1954) which is an offshoot of Lewin 1935 theory would therefore provide theoretical bases for the study. Maslow's motivational theory as a social and psychological factor expresses that there are two groups of needs; these are deficiency needs and growth needs. When the deficiency needs are made, people are likely to function at the higher levels (that is growth needs level) meaning that, when the deficiency needs are made self-directed learning or the desire to know and understand would be engaged in more easily. The implication of this is that teachers can encourage pupils to meet their growth need by enhancing the attractiveness of the learning situation. In the light of these, when the environment where the child is learning (relationship dimension, personal growth, system

maintenance and change dimension) is attractive effective learning is likely to take place. Maslow (1954) theory was therefore adopted for this study. In this study therefore, an investigation into correlation between psychosocial factors of classroom environment as a predictor for academic performance was carried out to find out if any of the factors was a motivation of performance in upper basic science students.

1.2 Statement of the Problem

The importance of Basic Science as a bedrock for other science subjects and technological development of the nation cannot be overemphasized. It is unfortunate however, that students' academic performance based on the examinations results, (Junior NECO, JSCE) in Upper Basic Science is very poor. Igwebuike (2013) Pilot Test confirms this assertion that the failure rate in the sciences is high. Students' performance in science subjects have genesis from the basic science in Junior Secondary School classes (Usman, 2008). Academic performance in Basic Science has generally been on the decline (Lawal, 2010). Transition from junior secondary school to senior secondary school is challenging because they face a lot of stress associated with science learning (Usman, 2007). This stress comes from the attitude of teachers to psychosocial factors in the classroom discourse which exert an adverse effect on students functioning and cause them to develop an unpleasant attitude to science at the senior secondary level (Hills, 2009). Poor teaching method was observed as causes to poor performance in science (Hills, 2010).

Classroom behaviour of teachers may also have motivational effects on learning process and on the performance of students. There was need to try other factors such as classroom environment to see whether or not students' academic

performance would be enhanced since other variables such as teaching methods, attitude have been used. Adesoji and Olatunbosun (2008) opine that poor classroom organization management techniques and poorly coordinated students activities are some of the factors which threaten students and young teachers from deriving maximum benefits during class work. Research in classroom environment to support this claim is however relatively sparse. The understanding of the nature of the learning environment for a meaningful organization of learning process is important. In this study, analysis of Psychosocial Factors of the classroom Environment as a predictor to academic performance in Upper Basic Science Secondary School (JSS II) students in Kaura Local Government Area of Kaduna State was analysed.

1.3 Objectives of the Study

The objectives of the study are to:

- i. determine the perceived psychosocial factors (socio-economic status, competition, and friction, cohesiveness difficulty satisfaction teacher support) as a predictor to academic performance in upper Basic Science.
- ii. analyse the relationship between male and female students' psychosocial environment and academic performance in Upper Basic Science.

1.4 Research Questions

The following research questions were asked and answered in the study

- i. What is the relationship between the psychosocial factors of classroom environment and academic performance in Upper Basic Science?
- ii. What is the relationship between psycho-social factors of classroom environment and academic performance in Upper Basic Science students based on gender?

1.5 Hypotheses

The following null hypotheses were stated and tested at $P < 0.05$, level of significance

H₀₁ There is no significant relationship between the psycho social factors of classroom environment and academic performance in Upper Basic Science.

H₀₂ There is no significant relationship between psycho-social factors of classroom environment and academic performance in Upper Basic Science based on gender.

1.6 Significance of the Study

The study is conceived to highlight the psychosocial factors of classroom environment as a predictor to academic performance in Upper Basic Science Secondary School in Nigeria and it will hopefully uplift the standard of basic science education, in the following ways:

Basic Science Teachers

The findings highlighted psychosocial factors that hinder proper understanding of basic science in the classroom. When implemented and properly practiced in the classroom, it will provide basic science teachers with useful information about relationship of students' psychosocial factors such as friction, difficulty, competition, cohesion, satisfaction and socio-economic status and the effects they have on performance in basic science. The result of this research will help basic science teachers concentrate on factors that impede academic performance. The result of these studies if properly inculcated will help teachers teach effectively and students precisely learn better in basic science if their psycho-social factors are identified and controlled.

Basic Science Students

The result of this finding will assist students in productive participation in subject matter therefore improving mastery of concepts and transfer of knowledge to real life situation through the application of cohesion in class, avoid friction and unnecessary competition. It will help students in coping with issues of cooperation, cohesion and friction because scientific findings are shared and correlated for better understanding.

Researchers

It is hoped that the findings will be useful and relevant to researchers in the field of science education who seek to improve on performance among students of all categories to push forward the frontiers of knowledge on issues relating to science education.

The findings will add new information to the existing literature on basic science and psycho-social classroom environment.

Professional Bodies

The findings was hoped to be useful to such bodies as STAN, Curriculum Planners, School Counsellors, Government bodies and policy makers to organise workshops, seminars, conferences, in-house and train the trainers workshops on the issues of psycho-social factors of the classroom environment as predictors of academic performance in our science classrooms.

Textbook Publishers

This findings was hoped to assist textbook publishers to incorporate materials, experiences in the classroom climate especially the social and the psychological dimensions in textbooks that could consciously promote the teaching and learning of science not only help reduce under achievement in basic science and other related

science subjects, but also help encourage the study of science and subsequently leads to the nations' breakthrough in science mathematics and technology.

Parents

The findings of this study will give parents information on how to make their children, wards, have conducive classroom environment by giving social psychological and physical environment to their wards, children, to enhance conducive learning environment. These include counselling, financial assistance, etc.

1.7 Scope of the Study

Samples were drawn from government-owned secondary schools in Kaura Local Government Area of Kaduna State. Junior Secondary school Class Two (JSS II) students were used. JSS II students were preferred because they had already studied some concepts of Basic Science in their JSS 1 and so were better placed than the JSS 1 students who had not gone far in Junior Secondary school syllabus. The JSS III students were not asked to participate in this research because they were busy preparing for the Junior Secondary Certificate Examination (JSCE). The Psycho-Social Classroom Inventory Questionnaires was used to collect data for the environmental studies while the Basic Science Performance Test (BSPT) was used as the dependent variable. The psychosocial factors which the researcher intended to investigate were as follows:

1. Satisfaction and academic performance in basic science
2. Friction and academic performance in basic science
3. Difficulty and academic performance in basic science
4. Cohesion and academic performance in basic science
5. Competition and academic performance in basic science

These factors are verifiable and are some of the major psycho-social classroom issues for learning of science (Allwell, 2007)

1.8 Basic Assumptions

The study was based on the following assumptions that.

1. The schools where science students were drawn were typical of government-owned schools with low teaching facilities and low income parents and they represented science students in the state.
2. The psychosocial classroom Inventory (PSCI) was a way of determining a student's perception of his or her classroom climate.
3. The students' responses would correspond to the reality of their classroom climate.
4. Students were aware of their classroom environment.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This study investigated the relationship existing between classroom environment and academic performance in upper basic science among secondary school students. In this chapter, relevant literatures were reviewed under the following subheadings:

2.2. Teaching of Basic Science at Junior Secondary School.

2.3. Academic Performance in Basic Science.

2.4. Classroom Environment and Science Teaching and Learning.

2.5. Classroom Climate and Science Teaching and Learning.

2.6. Socio-Economic Status and Science Teaching and Learning.

2.7. Overview of Similar Studies.

2.8. Implication of Literature Reviewed for the Present Study.

2.2 Teaching of Basic Science at Junior Secondary School

Basic science is taught at both primary and junior secondary school due to 9 year basic education policy by federal government of Nigeria.

2.2.1 Concept of Integrated Science (Basic Science)

Different meanings have been given to Integrated Science, a common factor in all the definitions is that, it is expected to be taught as an activity-based and child centred. That is, it is science taught in a way that boundaries between Physics, Chemistry and Biology are broken. Fu (2010) opined that Integration, when applied to science courses, means that the course is devised and presented in such a way that students gain the concept of the fundamental unity of science, the commonality of

approach to problems of a scientific thought, and are helped to gain an understanding of the role and function of science in everyday life, and the fast revolving world in which they live. According to Olatoye (2009), Integrated Science is a course that offers the learners experiences which help them to develop an operational understanding of the structure of science that should enrich their lives and make them more responsible citizens in the society. Fu (2010) on the other hand views integrated science as an approach to the teaching of science in which concepts and principles are presented so as to express the fundamental unity of scientific thought and to avoid undue stress on the distinctions between the various scientific fields.

Integrated Science has come to stay in Nigerian Secondary Schools Curriculum. According to the National Policy on Education (FRN, 2009). Integrated Science is intended to build a solid foundation in sciences at Primary, Secondary and tertiary levels. Several attempts were made by different bodies and organizations to arrive at a suitable curriculum for science at these levels. The teaching and learning of some rudiments of elementary science dated back to the 18th century (Fu, 2010); Oludipe, (2014), but from the early part of nineteenth century (1870-1920) development of specific science curriculum began. The increased demand for knowledge in science at this period was influenced by economic, political and social development (Busari, 2007).

The importance of integrated science to national development and technological breakthrough cannot be overemphasized. The philosophy and objectives of integrated science as stated in National Policy on Education (FRN, 2009) has made it very clear. But integrated science as it is being taught in our schools today cannot meet this demand. (Atadoga & Onaolapo, 2008).

2.3 Academic Performance in Basic Science

Science teaching can only be result-oriented when students are willing and the teachers are favourably disposed, using the appropriate methods and resources in teaching the students. With the current increase in scientific knowledge the world over, much demand is placed, and emphasis laid on the teacher, the learner, the curriculum and the environment in the whole process of teaching and learning of science. Despite the importance of science to mankind and the effort of researchers to improve on its teaching and learning, the performance of students in the subject remains low in Nigeria. Among the factors that have been identified are, poor methods of instruction (Lawal, 2010) teacher's attitude (Ibe-Bassey, 2012), laboratory in-adequacy and poor science background (Ray &Patrick, 2007).

Papanastasiou (2009) reported that those who had positive attitude toward science tended to perform better in the subject. The affective behaviours on the classroom are strongly related to performance, and science attitudes are learned (Patrick, Ray &Kaplan, 2007) the teachers play a significant role during the learning process and they can directly or indirectly influence the student's attitudes toward science which in consequence can influence student's performance. Student's attitude toward the learning of Basic Science is a factor that has long attracted attention of researchers. Igwebuiké (2011) and Adesokan (2007) asserted that in spite of realization of the recognition given to Basic Science among the science subjects, it was evident that students still showed negative attitude towards the subject, thereby leading to poor performance and low enrolment. The performance of students in chemistry is also reported to be causally influenced by the previous experience of the students in Basic Science (Lawal, 2010). A student cannot learn chemistry effectively without going through some experiences in Basic Science (Igwebuiké, 2011).

Other factors that may have causal relationships with students' academic performance in science, particularly, Basic Science include teacher attendance at workshop, laboratory adequacy, class size and school location (Igwebuike, 2013). One of the fundamental problems facing science teaching today is the question of how current the professional teachers are. Some teachers who have been employed in the past decades have been doing the same thing, the same way all along. They have no knowledge of the current ideas and innovations that have taken place in the educational field in the recent past. What account, for this is that teachers have not been given the opportunity for re-training (Peter, 2010). He therefore recommended that teachers should be encouraged to go for workshop training in their areas of specialization. Laboratory adequacy which is a school environment factor has been reported to affect the performance of students in Basic Science (Okoh, 2011). Peters (2010) argued that students tend to understand and recall what they see more than what they hear as a result of using laboratories in the teaching and learning of science. The question, "Are smaller classes better than larger classes" continues to be debated among teachers, administrators and parents as well as in the research community.

However, Okonkwo (2010) concluded that research do not support the expectation that classes would of themselves result in greater academic gains for students. He observes that the effects of class size on student learning vary by grade level, pupil characteristics, subject areas, teaching methods and other learning interventions. Ajagun (2006), found that large class size was unconducive for serious academic work. Also Ajeyelemi (2006) found no significant relationship between the class size and students' learning outcomes. The relationship between location and student academic performance in science has been widely reported. Ndioho (2007) found that students in urban schools manifested more brilliant performance than their

rural counterparts. Also, Nworgu (2007), and Okebukola (2007) reported a significant difference in the performance of students in urban and semi-urban areas. However, Daramola (2005) in Ozaji (2008) did not find any significant difference in the urban and semi-urban schools.

In view of these conflicting reports, there was the need to carry out a study with a view to determining which of the selected variables (for example, Cohesiveness, Friction, Competition, Satisfaction, Difficulty and Socio-Economic Status) will have a causal relationship with student performance in science. This study therefore intended to analyse psycho-social factors of classroom environment as a predictor for academic performance in upper basic science secondary school students.

2.4 Classroom Environment in Science Education

Classroom environment encompasses a broad range of educational concepts, including the physical setting, the psychological environment created through social contexts, and instructional components related to teacher characteristics and behaviours (Patrick, Ryan & Kaplan, 2007). It is the perceived atmosphere both positive and negative resulting from physical and social setting available for the major stakeholders (teachers and students). Studivant (2015) opined that studies on classroom environment have been widespread across nearly all sub specializations of educational psychology. Researchers are interested in relationships between environment constructs and multiple outcomes, including learning, engagement, motivation, social relationships, and group dynamics. Early researchers recognized that behaviour is a function of people's personal characteristics and their environment (Moos, 2009).

In the educational setting, Bronfenbrenner's (1979) work on ecological contexts secured a place in educational research for studies of classroom environment.

Bronfenbrenner's (1979) Ecological systems Theory encompasses the layered environmental system of evolution in which human development takes place and emphasizes the importance of family, teachers, schools, and the larger socio-cultural environment on the developmental process. Urie Bronfenbrenner's (1979) research has evolved from examining purely physical elements of the environment to more complex models of psychosocial relationships between students in the classrooms as well as between the teacher and students. Environmental research beginning in the mid-1990s has focused on classroom environment variables with numerous positive and negative student outcomes. In addition to the wide array of outcomes investigated in relationship to classroom environment, psychosocial study has also been of interest to methodologists as the data structure poses a unit of analysis dilemma; in terms of examining classroom variables in combination with student outcomes.

2.4.1 The Physical Environment

The physical aspect of the classroom environment include classroom arrangement, seating, bulletin boards, black and white board displays and the physical climate, lightening and temperature (Okoh, 2011). When the physical factors e.g. seating arrangement, blackboard display, bulletin displays, lightening, temperature etc. are not conducive to the learners, it affects academic performance (Igwebuike, 2013). The physical environment was a focus in earlier studies of classroom environment, the physical environment has continued to appear in contemporary studies as an influence on behavioural and academic outcomes (Okoh, 2011). Current studies of the physical environment have investigated aspects such as class composition, class size, and classroom management (Kristy ,2012).

Class composition studies examine classroom grouping methods, including ability grouping of students, single-sex classrooms and cooperative learning groups.

Okebukola (2007), studies on class size have examined how class size influences student and teacher behaviours. In general, smaller classes are associated with students who are less stressed and are more frequently on-task with fewer reported behaviour problems than students in larger classes. Although teachers tend to use similar instructional strategies whether teaching large or small classes, there is some evidence to suggest that more class time is spent on administrative tasks for larger classes, leaving less time available for instruction. Some research has suggested that differences in academic outcomes based on class size are due to differences in student behaviours. Overcrowded facilities, too many students in certain classes, and lack of teachers' assistants are three major issues cited as potentially creating problems due to increased stress levels of students and increased teacher-reported incidences of behavioural problems (Studivant, 2015). These increased stress levels and behaviour problems found in larger classrooms are frequently accompanied by lower levels of academic achievement.

Teacher-to-child ratios are also of interest to many researchers (Usman, 2007) because the number of reported behavioural problems seems to increase as class size increases. Many researchers as reported by Kristy (2012) have observed that large classes, with 30 or more students, tend to have a larger number of students off task more often with fewer students engaged with the teacher than children in small classes of 20 students or less. Yet there may be a social cost for students in small classes; other researchers found that smaller classes also had high incidences of children engaging in a social and exclusionary behaviour. Whether students are engaging in on- task or disruptive behaviour can also be influenced by effective classroom management instructions and consistency of teacher enforcement. The timing of classroom management and organization also impacts students' perceptions of the teachers.

Therefore studies on the children psychological, social exclusionary behaviour and class management is very necessary and suggested.

This study intends to find out which of the factors i.e. cohesion, friction, satisfaction, difficulty, competition and socio-economic status are predictors to academic performance of Upper Basic Science Students.

2.4.2 Psychological Classroom Environment

Beyond the physical arrangement of a classroom a psychological environment is also created, based on the interaction of key players in the classroom, namely students and teachers. Research in this area has varied greatly and proliferated during the early twenty-first century. Studies have been particularly concentrated on student class participation rates, teacher support, and communication of learning goals (Kolawole, 2007). A psychological classroom environment is that environment where learning takes place in a quantifiable and perceptible characteristic. Students are engulfed by environmental information specific target. These attract students' interest, choices, support, participation that enhances mutual understanding. According to Kelly (2010), many teachers equate student engagement and on-task behaviour with classroom participation, typically a top concern for teachers. Researchers support teachers' intuition of a difference in the participation style of the different genders. Whereas girls are more likely to participate as part of the relational responsibility they feel toward the teacher, boys tend to respond more often if they feel the class is interesting and less often if the class is perceived as boring-indicating that for these students, teachers may be equally responsible for the participation level and learning (Patrick, Ray & Kaplan, 2007; Kanit, 2015).

The notion of feeling supported as students has also been extensively examined in the classroom environment literature. Helen Patrick and colleagues (Patrick, Ray, &

Kaplan, 2007) found that there was a strong, positive relationship between students' level of motivation and engagement and their perceptions of the classroom environment as being socially supportive. The perception of a climate of mutual respect is required in order for students to increase their use of effective study strategies and increase feelings of confidence about their ability to successfully complete assignments. Furthermore, when students perceive that they receive emotional support and encouragement from their teachers and academic support from their peers they are more likely to be on-task in the classroom and use self-regulated strategies.

2.4.3 Social Classroom Environment

A social classroom environment is the support, mutual respect task related interaction that exist amongst student and teachers with lesser focus on competition and friction in the classroom. A social classroom environment generates an intellectual environment where support, respect and collaboration are central. Positive educational environments are necessary to facilitate optimally adaptive student outcomes, including learning, motivation, school adjustment, and achievement (Okoh (2011). Researchers (Okonkwo 2010; Peters 2010 & Okoh 2011) have been noting for some while that school success does not only involved academics. Schools and classrooms are inherently social places, and students go about their work in the presence of many peers. To understand students' success at school, therefore, we must attend to their relationships with others at school and ways that the environment promotes different types of social interactions and relationships. The classroom social environment is comprised of students' perceptions about how they are encouraged to interact with and relate to others (for example. classmates, the teacher), and encompasses dimensions of:

- i. teacher support,
- ii. promoting mutual respect

- iii. promoting student task-related interaction, and
- iv. promoting performance goals.

Recent research has indicated that these various dimensions of the classroom social environment are separate, can be measured quickly and reliably, and relate significantly to students motivation, self-regulated learning, classroom behaviour (both positive and negative), social relationships, and achievement (Patrick, Ryan & Kaplan, 2007). The emphasis on the importance of the classroom social environment, including support, mutual respect, task-related interaction among students, and a lesser focus on competition among students, is apparent in reform recommendations. For example, the American National Science Education Standards include explicit reference to teachers creating a social and intellectual environment with support, respect, and collaboration as central features (Kristy, 2012). The American, National Council of Teachers of Mathematics (2009) also explicitly addressed these social norms when they outline what teachers should strive to create in their class. For example, they advocate that students be encouraged to share their ideas and to seek clarification until they understand (Kanit, 2015).

To achieve this kind of classroom, teachers need to establish an atmosphere of mutual trust and respect. When teachers build such an environment, students understand that it is acceptable to struggle with ideas, to make mistakes, and to be unsure. This attitude encourages them to participate actively in trying to understand what they are asked to learn because they know that they will not be criticized personally, even if their mathematical thinking is critiqued (Kanit, 2015).

Although the social environment of the classroom is likely to be important to motivation and engagement for students of all ages, it may be particularly important for adolescent students. Adolescence has been identified as a particularly precarious stage

regarding changes in achievement beliefs and behaviours (Kanit , 2015). Certainly, for some adolescent students, the increases in self-reflection, autonomy, and identity exploration lead to new academic interests, increased self-regulated learning, and a commitment to education (Fraser, 2007). However, for many children early adolescence marks the beginning of a downward trend in academics. More so than at other ages young adolescent doubt their abilities to succeed at their school work, question the value of doing their school work, and decrease their effort towards academics (Kanit, 2015).

2.4.4 Psycho-social Factors of Classroom Environment

A classroom where the psychological and social environment exists is that environment where factors like teachers support, peer group interaction, mutual respect and choices on the subject matter are guaranteed. Students and instructors agreed that teacher support was the most prevalent dimension of the actual classroom environment. Both groups also ranked Organization and clarity and Task Orientation second and third in the actual classroom. The students placed involvement and affiliation as fourth and fifth, while the instructors reversed the order to these two subscales. The two groups agreed on the order of the last two subscales, Personal goal Attainment and Student Influence.

Despite the agreement in the order of the elements, there were significant differences between the students and the instructors with regard to the levels of the classroom environment elements. The study's comparison of the developmental studies students' views of the actual classroom environment with those of the instructors indicated that the instructors perceived more of every subscale of Adult Classroom Environment Studies (ACES) than the total group of students, Personal Goal Attainment and Student Influence. They saw their classrooms as places in which

students were more actively involved in the class activities and more interactive than students reported. Instructors focused attention on their interest in students' accomplishments. They also placed importance on working with the students on the task necessary to obtain needed skills (Kanit 2015).

2.4.4.1 Classroom Cohesiveness as a Predictor for Academic Performance in Basic Science

A cohesive classroom refers to the extent in which students are friendly and helpful towards each other. As early as 1962, Maslow posited a psychological hierarchy in which the need for belonging took precedence over needs for knowledge and understanding. According to Okoh (2011), students who worked together liked school more than students who were not allowed to do so. They were more likely to say that they wanted their classmates to do well in school and that they felt their classmates also wanted them to do well. By participating in social-climate setting activities, both students and teachers came to better understand each other's value systems and began to create a cohesive environment. This enabled them to work together toward the common goal of social and academic achievement (Studivant, 2015).

Cohesion within the classroom was of great importance and was another aspect that needed to be examined before a positive social climate could be established (Anca, 2009). Anca (2009) described cohesion as the .sum of group members' feelings about their group as a whole. In cohesive classrooms students valued their classmates, were involved with and cared about each other, tried to help one another, and were proud of their membership in the group. They wanted to be competent doers and producers, and wanted to be known by others for their accomplishments. Educators who recognized that it was normal for students to yearn for success and recognition created learning experiences that helped to establish equilibrium and ensured success for all students (Kanit, 2015).

2.4.4.2 Classroom Friction as a Predictor to Academic Performance in Basic Science

Friction is the amount of tension that exists among students and staff, was another factor of interest involving the environment. Researchers tried to determine whether or not a relationship existed between friction and academic performance. Kanit (2015) studied a group of sixth grade classrooms in schools having both English bilingual bicultural education programs and non-bilingual education programs. The participating schools were in Northern and Southern New Mexico. Data collected included age, sex, ethnicity, type of classroom (bilingual and non-bilingual) and third and fifth grade California Test of Basic Skills achievement scores in language arts, reading, and the battery total.

Four elementary schools from two school districts were included. A total of 157 students were involved in the study. The instrument used to obtain the climate scores was a modified studies of the My Class Inventory. The modified instrument used all climate scales except that of difficulty. A step-wise regression was utilized. Kanit found that the lower the degree of friction perceived, the higher the students' levels of achievement would be.

2.4.4.3 Classroom Satisfaction as a Predictor for Academic Performance in Basic Science

Classroom satisfaction is the extent to which students enjoy a class. An effective school climate has been described by David, (2012) as a school environment in which the staff, students, and patrons attain high levels of satisfaction and productivity. Jon (2011) stated that climate consists of two major dimensions - satisfaction and productivity. He described satisfaction as the sense of fulfilment of needs an individual experiences, along with enjoyment and happiness, as a result of the environment. Since the 1950s the literature has consistently reported that the

relationship between satisfaction and productivity is neither predictive nor causal. This lack of predictive link between satisfaction and productivity led most researchers and theorists to conclude by the 1960s that morale studies were important only if measures of satisfaction were sought, but such studies were relatively meaningless for use in making inferences about productivity (Jon, 2011). This stimulated a number of studies based on the assumption that a direct and casual link between human satisfaction and human productivity exists.

Jon (2011) examined the relationship between school climate (as defined by teacher satisfaction), classroom climate (as defined by students' satisfaction), and students' performance. He investigated the magnitude of the relationships between eight school climate domains and a measure of global school satisfaction among 2,049 middle and high school students. In West Virginia USA, test of moderator effects were conducted to determine if the magnitude of the relationships between the school climate domains and school satisfaction differed as a function of students' gender, grade, age, GPA, or SS. Multiple regression analyses suggested that five school climate domains are significantly related to school satisfaction ($p < .02$). Academic Support (beta weight = 0.17), Positive Student-Teacher Relationships (0.12), School Connectedness (0.11), Order and Discipline (0.13), and Academic Satisfaction (0.12). In addition, the importance of the school climate variables to students' school satisfaction appeared invariant across the demographic variables and academic performance level. The inclusion of school climate and school satisfaction measures may form a foundation for more comprehensive assessments for understanding and monitoring the experiences of students in schools. This study therefore intends to analyses student's satisfaction as a predictor to academic performance in Upper Basic Science.

2.4.4.4 Competitiveness as a Predictor to Academic Performance in Upper Basic Science

This is a classroom environment whereby rivalry is emphasized. One extremely important consideration in the development of classroom climate was that of cooperation versus competition. A cooperative goal structure existed when students perceived that their own achievement goals were dependent on how well other students achieved their goals. Cooperative goal structures resulted in the most accurate communication between students, constructive conflict management, a decreased fear of failure, increased levels of trust, greater peer acceptance, and improved support and emotional involvement in learning (Kolawole, 2008). Competitive goal structures existed when students competed with each other for achievement goals. When competing cliques evolved, students were more likely to focus on negative attributes of others and were more likely to become social isolates, rejected by others. Kolawole, (2008) and Kanit (2015) reported that social comparison in the public classroom was extensive, including announcement of high and low scores, charts of students' progress, ability grouping, and displays of selected papers and achievements.

The impact of this type of competition on students when they compared unfavourably could be seen in the students' of their own ability, avoidance of risk taking, use of less effective learning strategies, and negative affect directed toward self. Students' self-evaluations of their ability were more negative when the students were focused on winning than when they were focused on improving their performance. In classrooms characterized by public evaluation, students became more focused on their ability and the distribution of ability in the classroom group. Many students not only came to believe that they lacked ability, but this perception became evident among peers. Because performance oriented or competitively oriented environments encouraged a focus on ability, they did not support the use of strategies that required

sustained effort over time. Another large body of educational research has focused on the communication of learning goals to students in combination with the individual goals and expectations of students. Some students and classrooms are more focused on obtaining grades than on mastery of objectives; these students and classrooms are said to be performance oriented rather than mastery oriented.

A multitude of studies have examined this social-cognitive aspect of classrooms and found that the classroom-level learning goal can be linked to both behavioural and academic outcomes. Students in classrooms where performance is emphasized are more likely to engage in cheating, avoid help-seeking, and exhibit lower levels of academic engagement. In contrast, students who are in a classroom where the focus is on learning and improvement demonstrate higher levels of self-efficacy and engagement as well as more positive affect. At the personal goal level researchers have found that whereas students who are more focused on grades tend to have higher grades, those students who are more focused on mastering objectives tend to engage in more academically challenging tasks and retain information learned for a longer period of time.

According to Kolawole (2008), an important goal for teachers was to develop an environment that accepted individual differences and allowed all students to develop a feeling of belonging. Competition fostered cautious, defensive interaction and misleading and threatening communication. Individualistic goal structures were formed to separate students, reduce interaction, and allow independent learning experiences. In individualistic settings, students worked by themselves without interacting with one another (Kanit, 2015). In order to avoid such isolation the teacher may have chosen to incorporate varied groupings. Kolawole (2008) found that a diversity of grouping arrangements providing opportunities for peer cooperation and

cooperative learning minimized individual fears of failure and competition. The use of cooperative groups was also found to be more effective in creating a positive atmosphere (Kanit, 2015).

Compared with traditional methods, cooperative learning was found to promote better relationships among different ethnic groups and greater acceptance of students who had disabilities (Kanit, 2015). When students' psychosocial needs were met, they performed well academically. Interpersonal student relationships were important to meeting psychosocial needs. In classes where students disliked one another, factors such as hostility, competitiveness, distrust, insecurity, and aggression developed, preventing students from performing well (Kolawole, 2008). This study intends to analyze students' competitiveness as a predictor to academic performance in Upper Basic Science.

2.4.4.5 Difficulty as a Predictor to Academic Performance in Basic Science

Difficulty is the extent to which students have trouble with the work in the class. A final component in determining classroom climate was that of difficulty. Awosiyani (2006) stated that challenge was a factor incorporated in the design and structure of a learning task. He argued for tasks that offered personal challenges to students. According to his study, when tasks were enriched with such a motivational embellishment, the tasks were more likely to create an intrinsic purpose in learning.

Awosiyani (2006) reported that students tended to try to meet established performance standards as long as they were perceived to be achievable. When standards were set too high and learning tasks became too difficult, however, the results were discouraging and diminished performance. This study looked into the attitude of primary school mathematics teachers towards the use of Activity –Based Learning (ABL) methods in teaching mathematics in Nigerian Schools. Some two

hundred and twenty four (224) primary school teachers made up of 60 males and 164 females were sampled using purposive sampling from Damaturu LGA of Yobe State of Nigeria. Four research questions and three hypotheses guided the study. Simple frequency counts, percentages, t-test and analysis of variance were used to analyze the data. The result of the study showed that primary school mathematics teachers are positively disposed to the use of Activity-Based learning methods in the sense that they understand it and prefer to use it in schools. The study also showed that the teachers agreed that Activity-Based Learning is very significant to the students learning and that ABL enhances students learning experiences. The study further identified lack of materials and time as the major impediments to Activity –Based Learning in Nigerian schools.

The study further showed that gender and years of experience of the teachers do not affect the attitude of primary school mathematics teachers towards the use of Activity-Based Learning in schools. However, the study showed that there is a significant difference in the primary school mathematics teachers' attitude towards the use of Activity –Based Learning between the University degree graduate and College of Education graduate teachers. Azuka (2013) and Studivant (2015) found a positive relationship between difficulty of work in class and performance gains for low ability girls. However, high ability students showed no significant relationship between subject difficulty and performance gains. Anderson's findings suggested students performed best when challenged. The study also suggested that students only worked hard enough to achieve a certain level; but when the work was perceived as difficult, students probably prolonged their efforts before assuming they had reached their personal goal. Stated in another way, students applied themselves out of a fear of failure, and they continued to work hard as long as their fear existed. Limited research

was available in the area of subject difficulty, and the results were inconclusive. This study intended to analyze the concept of difficulty as a predictor for academic performance in upper basic science.

2.5 Classroom Climate in Science Education

A classroom climate is a critical mass of physical, psychosocial and social settings which account for the difference in students' performance. Patrick, Ray and Kaplan (2007). They also opine that classroom climate is a comprehensive structure made up of culture, physical plant, organizational structure, social relationship and individual behaviours influenced by outside forces as well as by the emotion of the staff and students. Patrick, Ray and Kaplan (2007) also concluded, rather reluctantly, that testing was the best way to compare schools, and researchers have been using test results to compare schools ever since. In addition to comparing socioeconomic status of students with academic performance, researchers have also linked classroom climate indicators with academic performance.

School climate has been ever changing. The elements of climate have been complex, ranging from the quality of interactions to the physical comfort levels of the individuals. No single factor has determined the classroom climate; however, the interactions of various factors have created a fabric of support that may have affected learning at optimum levels. Making even small changes in the classroom has been thought to lead to significant improvements in classroom climate (Busari, 2007), but determining the specific changes impacting on climate and resulting in improved student performance has been difficult to determine. Part of the larger focus on school improvement is the psycho-social climate, which defines how teachers interact with each other and with administrators. This is different from classroom climate, which

identifies relationships among students with each other, the teacher and how this translates into learning.

There are a number of tools available to determine Classroom Climate and then to use the results as part of the comprehensive plan for school improvement. Even the most sophisticated measurement tools rely heavily on opinion and perception. Opinion is generated from information, statistics on students and teacher performance, while perception is based on observation of the behaviours in the classroom and the school (Busari, 2007). In determining Classroom Climate, it is important to apply information gathered from both opinion and perception to form a comprehensive picture to student success and to therefore create a meaningful school improvement plan. Research work of Okebukola, (2007) has generated opinions reviewing student test scores, grades earned, attendance, health and family. Perception is formed by paper and pencil tools that evaluate Classroom climate based on organization of the classroom, the attitude toward student achievement, the attitudes toward school, the attitudes toward peers, the degree of democracy experienced in the classroom, the acceptance of diversity, the range of learning experiences, the autonomy of the teacher, the competitiveness among students, the consistency of interpretation of rule infractions and their consequences. This study therefore intends to find the relationship that exist between (competition, friction, satisfaction, difficulty, cohesion, socio-economic status) and academic performance in Basic Science.

2.6 Socio-Economic Status in Science Education

Socio-economic status is an economic and sociological combined total measure of a person's work experience and of an individual or families economic social position in relation to others. Based on income, education and occupation, when analyzing a family's SES, the household income earnings, education and occupations are examined

as well as combined income versus an individual's. When their own attributes are assessed, socioeconomic status is typically broken into three categories i.e. high SES, medium SES and low SES. The Coleman Report (Coleman et al., 1966) was a comprehensive assessment of school performance throughout the United States.

The study encompassed approximately 600,000 students in 4,000 elementary and secondary schools in the country. One of its objectives was to document how much students learned as measured by performance on standardized achievement tests. Coleman's report revealed that as low socioeconomic status (SES) students proceeded through school, they continued to perform below the national average at all grade levels on all measures. He further estimated that the percentage of school influence on student achievement accounted for only 10% to 20% of the total variance. Adewale (2012) Studies reveals the relationship between home-based environment factors and the academic performance of students in selected secondary schools. In that study, one hundred and eighty (180) students in Edu Local Government Area of Kwara State were randomly selected from three different secondary schools. The four factors that were examined and statistically analyzed were:

- i. Parental socio-economic background,
- ii. Parental educational background,
- iii. Parental educational qualification and
- iv. Students' health statuses.

Diverse statistical tests were performed on the various data collected to establish statistical significance of the effects on students' academic performance. Parental socio-economic statuses and parental educational background did not have significance effect on the academic performance of the students. However, the parental educational qualification and health statuses of the students were identified tom have

statistical significant effect on the academic performance of the students. The two variables that indicated significant influence do reflect nature of the student' home environment and played notable role in the academic performance of the respondents. Government could intervene to raise level of academic performance among students in rural area.

2.7 Overview of Similar Studies

In response to the concern of the need to improve the scientific skills, Sophie (2014) investigated the influence of text design (in terms of text cohesion) and individual differences, with the aim of identifying pathways to improving science education in early secondary school. One hundred and four secondary school children in Warwick South were selected (56 females, 48 males), aged 12–13 years took part in the study. To assess the influence of local cohesion (lexical and grammatical links between adjacent sentences) in science texts, the research measured students' comprehension (through multiple choice questions) of science text that was high and low in local cohesion. To explore the role of individual differences, students completed tests to measure general reading ability, general intelligence, facets of conscientiousness, science self-concept and individual, friends and family aspirations in science. A correlation research design was used with Pearson Product-Moment Correlation statistical tool was used. Students were more accurate in answering comprehension questions after reading text that was high in cohesion than low in cohesion, suggesting that high local text cohesion improved students' comprehension of science text. Reading ability predicted increased comprehension for both text designs. Individual aspirations in science accounted for unique variance for comprehension for high cohesion text of which implications for the teaching of secondary school science are discussed. This research work similarly tested

cohesiveness as a predictor to academic performance of upper basic science students using the Basic Science Performance Test and the Psycho-Social Classroom Inventory.

Similarly, Azrinawati (2013) study aims to identify main factors that influence academic performance of first year accounting students at Universiti Tenaga Nasional, Malaysia. Demographic factors, motivation factors and learning styles were investigated as factors contributing to the differences in students' academic performance. 170 students returned completed questionnaire. Spearman Correlation Analysis method was used to show the relationship between the three factors with the students' academic performances. The research design was correlational survey. Results showed that there is a significant relationship between motivation factors such as intrinsic motivation, extrinsic motivation as well as self-efficacy towards the students' academic performance. This study also found that associated students' academic performance is directly influenced by learning styles. However, the results also indicated that there is no significant relationship between gender and students' prior academic knowledge/background. This study contribute to the knowledge storage of accounting education where the research provide adequate evidence to the lecturers and students itself in adapting responsibly on factors relations discussed in this study. This study also investigated the psycho-social factors of satisfaction, competitiveness, cohesiveness, friction and difficulty as a predictor to academic performance in upper basic science and gender. Peter (2014) also looked at psychosocial factors on gender as a predictor to academic performance. In his work, he investigated the effect of gender on students' academic performance in secondary school Social Studies. The study adopted a quasi-experimental design (2x2 non-randomized pre-test, post-test control group) comprising six groups made up of four experimental groups and two control groups. Six schools 180 Upper basic 2 students in Delta and Edo States made up the

sample for the study. Six intact classes were randomly selected and assigned to experimental and control groups. The instrument used in this study was the achievement instrument tagged “Social Studies Achievement Test” (SSAT).

The validity and reliability of these instruments were established. The reliability of the instruments was established using Pearson product moment correlation coefficient (r). And the reliability coefficients obtained was 0.79. Means, Standard Deviation, Analysis of Covariance (ANCOVA) Result revealed that: gender (male/female) had no significant effect on student’s achievement in Social Studies and finally, result showed that there was significant interaction effect of treatment and gender on students’ academic performance in Social Studies. Similarly, this research work repeated this study in Kaura Local Government Area of Kaduna State using different design and instrument on upper basic science students.

Oladejo, et al, (2011) examined the effect of using standardized and improvised instructional materials on Academic Achievement of Secondary School Physics Students in Oyo State, Nigeria. The research design adopted was quasi-experimental of the pretest – post test non-randomized control group. Purposive sampling was used to obtain a sample of three co-educational secondary schools. Each school provided one S.S. III class for the study. Two instruments were used in the study, the Physics Achievement Test (PAT) to measure students’ achievement and Teachers Instructional Guide (TIG) to train the teachers in the experimental groups. The instrument was pilot tested to ascertain reliability. The reliability coefficient was 0.76. Three hypotheses were formulated and tested at 0.05 level of significance. Data were analyzed using ANOVA and ANCOVA. Findings revealed that there is a significant difference in the achievement of students taught using standard instructional materials, those taught with improvised instructional material and those in the conventional instruction. Thus, the

students taught with improvised instructional materials obtained the highest achievement score at post-test ($F=74.94$), followed by those with standard instructional materials ($F=63.07$), while the control group scored the lowest ($F=39.89$). Also, there was no significant effect of gender on students' achievement in Physics although, females did better than males.

Finally, there was no significant interaction effect of treatment and gender on student achievement in Physics. Thus, Physics teachers need to be resourceful in instructional materials selection, planning and utilization so as to reduce the cost of production and maintenance of instructional materials. This research work also investigated the psycho-social factors on Basic Science Performance Test to find the relationship on performance and gender on students in Kaura Local Government Area of Kaduna State Nigeria. Finally, Barry, (2006) addresses the increasing importance of student test scores by examining the different factors that influence test scores. Composite test scores of tenth grade students from his educational study of 2002 were examined using a four-part model which include student role performance, school, family, and peer factors. Ordinary Least Squares analysis indicates that the strongest predictor of student test scores is socioeconomic status, resulting in a statistically significant increase in the standardized coefficient of 0.224 points. This study intended to investigate the psycho-social factors of friction, satisfaction, cohesiveness, competition and difficulty as a predictor to academic performance of upper basic science students of Kaura Local Government Area of Kaduna State Nigeria.

2.8 Implication of Literature Reviewed for the Present Study

In the literature cited, from this study, the results obtained from the several research studies conducted in the area of competition, satisfaction, friction, difficulty, cohesion, and students' socio economic status. The implication is

that, numerous subjects taught in a socially and psychologically conducive environment recorded higher gains in academic performance: This implies that effective Psycho-social classroom environment can be a predictor to academic performance in Upper Basic Science. Related literatures about the consistent poor academic performance among science subjects by the constant use of traditional methods of instructions have also been reported. It is in the light of the above that the researcher considered it necessary that students learn science under psychosocial environment which enhance academic performance.

The search for improved strategies for teaching and learning science in order to stem the tide of students under performance is a continuous process. It is on the light of the above that this research considered it necessary that students and teachers in the learning process should be involved in activities where the perceived psychosocial environmental factors are considered as predictors to academic performance in our secondary schools. The studies reviewed did not provide consistent and convincing support for predictive validity of student perception resulting in learning outcome because they were done on collective environmental factors. This study conceived against this background. Each of the five psychosocial factors of classroom environment was used to assess students' perception of their environments as a predictor to academic performance in basic science.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This study investigated psychosocial classroom environment as a predictor to upper basic science performance. The methodology as it affects this study is presented in this chapter based on the following sub-headings;

3.2 Research Design

3.3 Population of the Study

3.4 Sample and Sampling Techniques

3.5 Instrumentation

3.6 Validity of the Instrument

3.7 Pilot Testing

3.8 Reliability of instruments

3.9 Item Analysis

3.10 Data Collection Procedures

3.11 Procedure for Data Analysis

3.2 Research Design

The research design was correlation study. Data were collected using Basic Science Performance Test. (BSPT) and the Psychosocial Classroom Inventory (PSCI). Selected variables of psychosocial factors such as competition, friction, cohesion, satisfaction and difficulty were employed to determine which of them are predictors to academic performance in Basic Science.

3.3 Population of the Study

The population of the study comprised all the second year coeducational junior Government Secondary School (JSS II) students in Kaura Local Government of

Kaduna State of Nigeria. The Local Government Area was chosen for this research because of the large number of students' enrolment.

In the local government area, there were 11 JSS schools; nine of the schools were Day secondary schools while two were boarding. Coeducational schools were used for the study in order to accommodate the gender variable which is an important variable in this study. Record of enrolment examined showed that there were 2510 JSS II students in the target population comprising 1330 boys and 1180 girls. A summary of the description of the population is presented in Table 3.1

Table 3.1: Population of the Study

S/no.	Name of School	Location	No. of JSSII Students'		Total
			Enrolment		
			Male	Female	
1	GSS Manchok	Manchok	150	150	300
2	GSS Bondong	Bondong	150	130	280
3	GSS Zankan	Zankan	110	110	220
4	GSS Attakar	F/Attakar	120	115	235
5	GSS Kaura	Kaura	150	150	300
6	GSS Tum	Kagoro	110	80	190
7	GSS Kagoro	Kagoro	110	100	210
8	GSS Kadarko	Kadarko	130	110	240
9	GSS Zangang	F/Attakar	100	70	170
10	GSS Mahuta	Manchok	105	65	170
11	GSS F/Daji	Kagoro	95	100	195
Total			1330	1180	2510

Source: Kaura Local Government Area, Kaduna State Ministry of Education (2015)

3.4 Sample and Sampling Techniques

The sample for this research was selected using purposive random sampling technique from schools in Kaura local government area of Kaduna state. Kaura has JSS II population of 2510 students (N = 2510). Three coeducational schools were purposefully selected for participation because of gender involved in the study and are on the public schools. While the principals of all the three schools in the population gave permission for participation, one teacher from each of the three schools agreed to help in the admission of the questionnaires. Participation by female students (N = 198) while male students (N = 142). 340 subjects were used for the study in line with

Krejcie & Morgan (1970) who suggested a sample size format to be selected based on the population size of the study. Kaura Local Government has three chiefdoms, the Moro'a Chiefdom, Kagoro Chiefdom and the Atakar Chiefdom. One secondary school from each chiefdom was purposively selected using balloting system for the study and 340 subjects of the three schools namely Government Secondary School Mahuta Manchok for Moro'a Chiefdom, Government Secondary School Zangang Fadan Atakar for the Takad Chiefdom and Government Secondary School F/Daji Kagoro for the Kagoro Chiefdom were selected as illustrated in Table 3.2.

Other factors influencing school selection included the general acceptance of each principal to carry out the study in their school. The detail of the study sample is presented in Table 3.2

Table 3.2: Sample for the Study

S/No.	Name of School	Location	No. of JSSII students		Total
			Enrolment		
			Male	Female	
1	GSSMahuta	Manchok	40	65	105
2	GSSZangang	F/Atakar	51	62	113
3	GSS F/Daji	Kagoro	51	71	122
Total			142	198	340

Source: Kaura Local Government Education Office, Kaduna State (2014)

3.5 Instrumentation

The instruments for this study were Basic Science Performance Test (BSPT) and Psychosocial Class Inventory (PSCI)

Basic Science Performance Test (BSPT)

Basic Science performance Test is a multiple choice items with options to choose one which is the correct answer meant to test the subjects' knowledge of the topic. Section B items on Basic Science Performance Test consist of 20 multiple choice items with options ABCD and the questions were derived from the revised topic syllabus of the Upper Basic Science course (FRN, 2009). The topics were used on the

fact that they are reported on high failure rate. The result was 26.1% pass (NECO 2014).

The Instrument covered all the topics selected for this study. Marking scheme for the 20 test items was constructed; as shown in Appendix C. To further ascertain the reliability and suitability of the test items, the instrument was pilot-tested.

Table 3.3: Item Specification for the BSPT of 20 Items Based on Bloom Cogne Taxonomy

Topic	Know- ledge	Competi- tiveness	Appli- cation	Anal- ysis	Synth	Eva	Told	%
Water Pollution	123	20	5	4	6,14	17	9	45%
Health Science	11	0	0	7,13.16	15	0	5	25%
Air Pollution	8		19	9	10	18	5	25%
Water Habitat	0	12	0	0	0	0	1	5%
Total	5(25%)	2 (10%)	2 (10%)	5 (25)	4 (20%)	2 (10%)	20 (100%)	

Source: Researcher (2015)

Psychosocial Classroom Inventory

According to the Getzels and Thelen (1960) and Walbey (1969), theory of the class as a social system had proven successful in research, the theory suggested that in classrooms personalities, needs, and role expectation interacted to form a climate in which group behaviour including learning could be predicted. This is used to construct the psycho social classroom inventory. This instrument is used to measure the social and the psychological learning in the classroom as perceived by students.

The Psychosocial Classroom Inventory (PSCI) was adapted by the researcher from Bennett, (2001) and it was used in this study. The PSCI is a two-point response format (Yes, No) in order to make responding easier for JSS II students. Responses to the PSCI were provided on the same sheets as the questions, rather than on a separate response sheet, in order to reduce errors in the recording of answers (Fraser & Fisher, 1982). The PSCI is also more economical from the fact that it measures five different

dimensions, yet contains only 25 items (Fraser, 1981). The responses were marked 2 points for a YES and 1 point for a NO (Fraser & Fraser, 1982; Okonkwo, 2010). This is a 25-item developed by the researcher whereby a subject is asked to identify what his actual class environment is.

3.6 Validity of the Instruments (BSPT and PSCI)

Basic Science Performance Test designed by researcher and validated by three senior lecturers in the Faculty of Education A.B.U. Zaria. The 20-items instrument was based on the topics selected from the curriculum and scheme of work and were found relevant for this study. These are also topics that showed mass failure (WAEC, 2014). The content of the Basic Science Performance Test was validated by a panel of science educators who are experts in test construction in the Science Education Department, Ahmadu Bello University, Zaria. These comprised three lecturers with minimum of Ph.D qualification and minimum Rank of Senior Lecturer. They are to (1) check the language whether it was the same with the ability level of subjects of the study; (2) check the clarity of the statements used to avoid ambiguity. (3) They are to also check the context whether it is in line with the objectives of the study; and (4) the time allotment of the instrument if it is satisfactory. (5) It was suggested that content of the test items was appropriate, and relevant to the objectives of the study.

3.7 Pilot Testing

Pilot testing was carried out in order to determine reliability of instruments as follows:

Subjects used were the Junior Secondary School JSS II Students studying Upper Basic Science. The purpose of the pilot study was to further ascertain the feasibility and reliability of the instrument developed. The pilot test was carried out using twenty students from Government Secondary School Manchok which was not

part of the sample in the population. BSPT questionnaires was administered to the 20 students. Instructions on how to answer the questions were read out and explained to the students by the researcher, to ensure that students answered the instrument carefully. The same test was administered to the same set of students after two weeks in line with Tuckman's (1975) and Sambo's (2008) recommendations, which suggest a minimum of two weeks indicating that at that period students might have forgotten the content of the first test given. Pearson Product-Moment Correlational Coefficient Statistical tool was used for analysis.

The Psychosocial Classroom Inventory Questionnaire was administered to the same students once. In this, the Split Half Method was used employing odd and even number procedure. This was to test the internal consistency of the study. Spearman's Rank Brown Prophecy Correlation Coefficient was used.

3.8 Reliability of Instruments

The reliability coefficient of a test is the consistency with which the test repeatedly measures what it is intended to measure. Indices of reliability give an indication of the extent to which a particular measurement is consistent and reproducible (Lakpini, 2006). Reliability coefficient of a test can be determined by several methods such as Guttman split-half, test-retest, and parallel comparison.

Reliability of BSPT

Based on the analysis using Pearson Product-Moment Correlation Coefficient (PPMC) statistics, the reliability coefficient for the BSAT was found to be 0.73.

Reliability Coefficient of Psychosocial Classroom Inventory (PSCI)

The Spearman's Brown Rank Correlational study used above resulted in a correlation coefficient of $r=0.88$.

3.9 Item Analysis

The procedure for item analysis was as follows:

Facility Index (FI)

The facility index or difficulty index show the difficulty of each of the items based on the percentage of subjects who got an item correct. The facility index for the instrument BSPT was determined using Furst (1958) formula:-

$$F = \frac{RU + RL}{N} \times 100$$

Where

F = Facility Index

RU = Number of upper 27% of those who got the items correctly

RL = Number of lower 27% who got the items correctly

N = Total number of subjects in each of the upper and lower groups (not the total respondents of the test)

Items with facility indices of between 0.30 and 0.80 were recommended and considered by), Furst (1958), Usman (2000) and Lakpini (2006), as adequate for selecting good test items for achievement test. In this study therefore, the items with facility indices in the range of 0.30 to 0.80 were used for the study. Items with values between 0.029 were dropped because they were found to be too difficult while items with values of 0.80 and above were also dropped because they were found to be too simple (see Appendix E).

Discrimination Index (DI)

The discrimination index for each of the items were computed by subtracting the number of students in the lower group who score the item correctly from the number in the upper group who got the item correctly. The number was divided by half the number of the students.

$$D = \frac{RU + RL}{\frac{1}{2} N} \times 100$$

D = Discrimination Index

RU = Number among upper 27% who score the item right

RL = Number among the lower 27% of subjects who score the items correctly

$\frac{1}{2} N$ = Number of subjects in each of the upper and lower groups

According to Furst, (1958) and Usman (2008), items in a test with discrimination indices between 0.3 to 0.49 were considered moderately positive while those with discrimination indices of 0.7 are highly positive and if solely used, the well – informed subjects will get the test items right than the poor ones. The discrimination index ranging between 0.30-0.70 obtained for the items in this study were therefore used. Items with values between 0.029 were dropped because they were found to be too difficult while items with values of 0.80 and above were also dropped because they were found to be too simple (see Appendix E).

3.10 Procedures for Data Collection

The instruments were administered by the researcher. The students were given the BSPT and PSCI. Subjects were to identify the correct response on the options provided. During the administration of the instruments, the researcher distributed the BSPT to the study subjects. The researcher allowed the subjects to read through the written instructions on how to answer the questions. The instructions were explained verbally where necessary. The subjects were allowed 45 minutes for the test based on pilot study conditions where 45 minutes was assigned. This is based on the time suggested (Inyang, 1988; Usman, 2000). The subjects' response were collected and scored using the marking scheme as shown in Appendix C. Each correct response was scored 1 point to a maximum of 20 points. Wrong responses were marked zero. These were recorded for analysis.

The psychosocial classroom Inventory Questionnaire was also given to the subjects. The subjects were instructed to carefully circle Yes or No as was applicable to the class situation. The responses were marked two points for 'Yes' response, and one point for a 'No' response (Fraser & Fisher, 1983). The recorded marks were collected for analysis.

3.11 Procedure for Data Analysis

The data collected were analysed with the Statistical Package for the Social Sciences (SPSS) IBM Version 20. Procedures adopted includes Mean and Standard deviations, Correlation using the Pearson Product Moment correlation procedure for the research questions. The null hypotheses were tested with the Ordinary Least Square (OLS) multiple regression procedure to establish the predictive levels of the Psycho-social factors of the classroom environment on the students' academic performance. Test of significance was conducted at the probability level of 0.05.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSIONS

4.1 Introduction

The study analyses the psychosocial factors of classroom environment as a predictor to academic performance of Upper Basic Science students of Kaura Local Government Area of Kaduna State, Nigeria. This chapter is presented under the following sub-headings:

4.2 Data Analysis and Result Presentation

4.3. Solution to the research questions and Test of hypotheses

4.4 Summary of Findings

4.5 Discussion

4.2 Data Analysis and Results Presentation

A total of 340 SS II students made up of 142 (41.8%) males and 198(58.2%) female were involved in the study. The summary of their scores on the investigated psycho-social factors of classroom environment are presented in Table 4.1.

Table 4.1: Mean Scores of all the Students on the Variables

Psycho-social Factors and Performances	N	Mean	Std. Deviation
Satisfaction	340	11.12	2.859
Friction	340	9.05	3.078
Competitiveness	340	11.14	2.900
Difficulties	340	6.41	4.443
Cohesiveness	340	10.00	3.284
Performance	340	58.47	27.415

The table shows that the rating of the psycho-social factors were generally low among the students based on the multiple of the scale used in the measurement. In Table 4.2 the mean scores of the students by gender is presented.

Table 4.2: Mean Scores of the Variables by Sex of Students

Variables	Sex	N	Mean	Std. Deviation	Std. Error
Satisfaction	Male	142	11.06	2.866	.241
	Female	198	11.17	2.860	.203
Friction	Male	142	9.11	3.159	.265
	Female	198	9.01	3.025	.215
Competitiveness	Male	142	10.98	2.933	.246
	Female	198	11.26	2.879	.205
Difficulties	Male	142	6.39	2.321	.195
	Female	198	6.42	5.488	.390
Cohesiveness	Male	142	9.81	3.320	.279
	Female	198	10.13	3.261	.232
Performance	Male	142	60.27	27.441	2.303
	Female	198	57.18	27.393	1.947

The mean scores for the male and female students in the table are basically at the same range for all the psycho-social factors of classroom environment investigated. The only variable with major variability between the male and female students is in the BSPT scores where the male students tended to have higher score of 60.27 with a standard deviation of 27.441 while the female students had 57.18 with a standard deviation of 27.393. In effects, gender could not be said to be a major factor attributable to difference in the psycho-social factors of classroom environment among the students as well as in performance.

4.3. Solution to the research questions and tests of hypotheses

The research questions asked for the study are addressed as follows in this section:

4.3.1 Research Question One

What is the relationship between the psycho-social factors of classroom environment and academic performance in Upper Basic Science students?

To answer this research question, data from the Basic science Performance Test (BSPT) and the psycho-social Classroom Inventory (PSCI) analysed were subjected to Pearson Product Moment Correlation procedure on a bivariate relationship between the psycho-social factors and the performances (BSPT) of the students. The result is shown a correlation matrix in Table 4.3.

Table 4.3: Relationship between Psycho-Social Factors and Students Performance (BSPT)

Variables	Satisfaction	Friction	Competitiveness	Difficulties	Cohesiveness	Performance
Satisfaction	1	-.289(**)	-.092	-.166(**)	.272(**)	.078
Friction	-.289(**)	1	.217(**)	.137(*)	-.189(**)	-.121(*)
Competitiveness	-.092	.217(**)	1	-.025	-.142(**)	-.048
Difficulties	-.166(**)	.137(*)	-.025	1	.007	-.061
Cohesiveness	.272(**)	-.189(**)	-.142(**)	.007	1	-.032
Performance	.078	-.121(*)	-.048	-.061	-.032	1

(r-critical =0.107 at DF = 338 and P = 0.05)

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

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

The result of the test revealed that classroom environment's psycho-social factors of Satisfaction, Competitiveness, Difficulties and Cohesiveness were not significantly correlated with the students' performance (BSPT) ($P > 0.05$). But there was significant relationship between the psycho-social factor of Friction and the students' performances ($P < 0.05$). Between the classroom environment's psycho-social factors a high level of relationship was obtained ($P < 0.01$) with some exceptions like satisfaction with competitiveness, Difficulties with competitiveness, and cohesiveness. This observation imply that on a bivariate basis, the psycho-social factors of classroom environment have no significant relationship with the students' academic performance in Upper Basic Science. The only exception being Friction which was found to be negatively correlated with the students' performance.

4.3.2 Hypothesis One

There is no significant relationship between the psycho-social factors and academic performance in Upper Basic Science students.

To test this hypothesis, multiple regression approach was used with the ordinary least square procedure to determine whether the classroom environment psycho-social factors could be used as significant predictors of the students' academic performance in Upper Basic Science. The test model revealed a coefficient of determination (R^2) of 2.3% which imply that the selected psycho-social factors could only account for 2.3% of the variance component of the students' academic performance and the observed probability level for the model was 0.162 ($P > 0.05$). A summary of the regression estimates is presented in Table 4.4.

Table 4.4: Multiple Regression of Psycho-social Factors as Predictors of Students Performance (BSPT)

Psycho-social Factors	Unstandardized		Standardized	t	P-value
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	71.561	11.273		6.348	0.000
Satisfaction	0.553	0.563	0.058	0.982	0.327
Friction	-0.939	0.519	-0.105	-1.808	0.072
Competitiveness	-0.296	0.527	-0.031	-0.562	0.574
Difficulties	-0.232	0.341	-0.038	-0.680	0.497
Cohesiveness	-0.596	0.476	-0.071	-1.252	0.212

Dependent Variable: Performance

The table revealed that the examined classroom environment psycho-social factors were not significant predictors of students' performance. The only exception from this generalization is Friction was found to be a significant predictor at a probability level of 0.07. Considering that the fixed probability for the rejection of the null hypothesis was at 0.05, it could be safe to conclude that the examined classroom

environment psycho-social factors were not significant predictors of students' performance ($P > 0.05$). Though the factors were not found to be significant predictors of the students' performance but the model showed from the Beta estimates that Performance could be estimated with the following equation of $Y = a + bx_1 + bx_2 + bx_3 + bx_4 + bx_5$ where $Y =$ performance and x_1 to x_5 the psycho-social variables. Thus the function could be estimated as $\text{Performance} = 71.561 + 0.553\text{Satisfaction} - 0.939\text{Friction} - 0.296\text{Competitiveness} - 0.232\text{Difficulties} - 0.596\text{Cohesiveness}$. These observations provides sufficient evidence to retain the null hypothesis. Therefore the null hypothesis that there no significant relationship between the psycho-social factors and academic performance in Upper Basic Science students cannot be rejected.

4.3.3 Research Question Two

What is the relationship between students' psychosocial factors of classroom environment as predictor to academic performance in upper basic science on the basis of gender. To answer this research question, mean scores of the male and female students on the classroom environment psychosocial factors were computed and compared after which the relationship between the variables for the individual sex (male and female) were then correlated. Table 4.5 shows the test of differences between the males and female students while Table 4.6 and 4.7 shows respectively the test of relationship between the variables.

Table 4.5: Test of Mean Scores Between Male and Female Students on the Investigated Variables

Variables	Sex	N	Mean	Std. Dev.	Std. Error	t-value	DF	P-value
Satisfaction	Male	142	11.06	2.866	.241	-.328	338	.743
	Female	198	11.17	2.860	.203			
Friction	Male	142	9.11	3.159	.265	.297	338	.767
	Female	198	9.01	3.025	.215			
Competitiveness	Male	142	10.98	2.933	.246	-.889	338	.374
	Female	198	11.26	2.879	.205			
Difficulties	Male	142	6.39	2.321	.195	-.075	338	.940
	Female	198	6.42	5.488	.390			
Cohesiveness	Male	142	9.81	3.320	.279	-.890	338	.374
	Female	198	10.13	3.261	.232			
Performance	Male	142	60.27	27.441	2.303	1.024	338	.307
	Female	198	57.18	27.393	1.947			

(t-critical = 1.96 at P = 0.05)

The mean scores in the table revealed no significant difference between the male and female students in the investigated variables of classroom environment psychosocial factors and their academic performance. In the Table the observed probability level of significance for the tests are all above the fixed level of 0.05 ($P > 0.05$). This would imply that the male and female students were at the same level in the investigated variables. For a test of relatedness of the variables based on the students' gender, Table 4.6 shows the relationship between the variables for the male students.

Table 4.6: Relationship Between Psycho-Social Factors and Male Students Performance (BSPT)

Variables	Satisfaction	Friction	Competitiveness	Difficulties	Cohesiveness	Performance
Satisfaction	1	-.215(*)	-.167(*)	-.254(**)	.228(**)	-.015
Friction	-.215(*)	1	.409(**)	.111	-.199(*)	.029
Competitiveness	-.167(*)	.409(**)	1	-.050	-.256(**)	.021
Difficulties	-.254(**)	.111	-.050	1	-.104	-.165
Cohesiveness	.228(**)	-.199(*)	-.256(**)	-.104	1	-.105
Performance	-.015	.029	.021	-.165	-.105	1

(r-critical = 0.165 at DF = 140 and P = 0.05)

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

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

For the male students, none of the classroom environment psychosocial factors was found to be significantly ($P > 0.05$) correlated with their academic performance (BSPT). But there was a significant relationship between the psychosocial factors ($P < 0.05$). The only exception was Difficulties factor and that of competitiveness, Friction and Cohesiveness ($P > 0.05$). Table 4.7 shows the relationship between the psychosocial factors and the performances of the female students.

Table 4.7: Relationship Between Psycho-Social Factors and Female Students Performance (BSPT)

Variables	Satisfaction	Friction	Competitiveness	Difficulties	Cohesiveness	Performance
Satisfaction	1	-.344(**)	-.039	-.154(*)	.304(**)	.147(*)
Friction	-.344(**)	1	.073	.159(*)	-.180(*)	-.235(**)
Competitiveness	-.039	.073	1	-.020	-.063	-.094
Difficulties	-.154(*)	.159(*)	-.020	1	.041	-.035
Cohesiveness	.304(**)	-.180(*)	-.063	.041	1	.027
Performance	.147(*)	-.235(**)	-.094	-.035	.027	1

(r-critical = 0.140 at DF = 196 and $P = 0.05$)

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

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

The result of the relationship between the classroom environment psychosocial factors and academic performance (BSPT) for the female students revealed that female students' satisfaction and Friction were significantly correlated with their academic performance ($P < 0.05$). While satisfaction was positively correlated with the performance, Friction was negatively and highly correlated with the performance. But there was no significant relationship between factors of competitiveness, Difficulties, Cohesiveness and the female students' academic performances ($P > 0.05$).

4.2.4 Hypothesis Two

Hypothesis two states that there is no significant relationship between psycho-social factors of classroom environment and academic performance on the basis of gender. To test this hypothesis, multiple regression model was adopted with

the Ordinary Least Square procedure. This would allow the determination of the selected psychosocial factors as significant predictors of the male and female students' performance. Each of the gender was determined independently. For the male students, the observed coefficient of determination for the model was 1.0% which imply that the selected psychosocial variables could only account for 1.0% of the variance component of the male students' performance. The observed probability level for the model was 0.275 ($P > 0.05$). Table 4.8 shows the regression estimates for the male model.

Table 4.8: Multiple Regression of Psycho-social Factors as Predictors of Male Students' Performance (BSPT)

Psycho-social Factors	Unstandardized		Standardized	t	P-value
	Coefficients B	Std. Error	Coefficients Beta		
(Constant)	89.660	19.392		4.624	.000
Satisfaction	-.342	.863	-.036	-.397	.692
Friction	.308	.815	.035	.377	.707
Competitiveness	-.377	.886	-.040	-.426	.671
Difficulties	-2.273	1.037	-.192	-2.191	.030
Cohesiveness	-.994	.734	-.120	-1.353	.178

Dependent Variable: Performance

The result did not reveal that any of the psychosocial factors could be said to be a significant predictor of the male students' performance ($P > 0.05$).

From the regression estimate in the table, performance of male students could be estimated with the function $Y = a + bx_1 + bx_2 + bx_3 + bx_4 + bx_5$ where Y = performance and x_1 to x_5 the psycho-social variables. Thus the function could be estimated as $\text{Performance} = 86.660 - 0.342\text{Satisfaction} + 0.308\text{Friction} - 0.377\text{Competitiveness} - 2.273\text{Difficulties} - 0.994\text{Cohesiveness}$.

For the female students, the observed coefficient of determination for the model was 6.7% which imply that the selected psychosocial variables could only account for 6.7% of the variance component of the male students' performance. The observed

probability level for the model was 0.019 ($P < 0.05$). Table 4.8 shows the regression estimates for the male model.

Table 4.9: Multiple Regression of Psycho-social Factors as Predictors of Female Students' Performance (BSPT)

Psycho-social Factors	Unstandardized		Standardized	T	P-value
	Coefficients		Coefficients		
	B	Std. Error	Beta		
(Constant)	76.603	14.765		5.188	.000
Satisfaction	.827	.743	.086	1.113	.267
Friction	-1.889	.681	-.209	-2.773	.006
Competitiveness	-.745	.666	-.078	-1.118	.265
Difficulties	.057	.357	.011	.160	.873
Cohesiveness	-.357	.621	-.043	-.576	.565

Dependent Variable: Performance

In Table 4.84, the psycho-social factor of Friction is revealed to be a highly significant and negative predictor of the female students' performance ($P < 0.05$). But for the other psycho-social factors of satisfaction, competitiveness and cohesiveness their predictive values as predictors of the female students' performances were not significant ($P > 0.05$). With these observations, there is no sufficient evidence to reject the null hypothesis. Therefore, the null hypothesis which stated that there is no significant relationship between psychosocial factors of classroom environment and academic performance on the basis of gender is retained.

4.4 Summary of Findings

The major findings of the study are as follows:

1. Significant relationship exists between psycho-social factors of classroom environment of students in Upper Basic Science.
2. No significant relationship was found between the students' academic performance in Upper Basic Science and each of the psycho-social factors of

satisfaction, competitiveness, difficulties, and cohesiveness. Friction was found to be negatively correlated with the students' performance.

3. The investigated psycho-social factors were not found to be significant predictors of the students' academic performance. The only exception being that of Friction which was found to be a negative predictor and significant.
4. For the male students, none of the psycho-social factors was found to be a significant predictor of performance.
5. For female students' only Friction was found to be a significant and negative predictor of their performance.

4.5 Discussion

This study investigated psycho-social factors of classroom environment as a predictor of academic performance of Upper Basic Science SS II students in Kaura Local Government Area of Kaduna State. Two research questions were answered along with two null hypotheses which were tested to determine the psycho-social factors of classroom environment as predictors of the students' academic performance. From the analysis of the data relating to the first research question where the relationship between the psycho-social factors of classroom environment were correlated with the students' academic performance, it was observed that the psycho-social factors were not significantly correlated with the students' academic performance. The only factor found to have been significantly correlated with the performances of the students was Friction. A negative relationship was found between the academic performance of the students and Friction in the classroom environment.

In the test of the first hypotheses, the factors were subjected to a multiple regression model to determine their predictive effects on the students' academic performance. The result revealed that none of the factors could be regarded as a

significant predictor of the students' academic performance. The null hypothesis was therefore retained. This finding contradicts the report of Okebukola (2007) where he reviewed and evaluated classroom climate based on attitudes to peers, degree of democracy in class, the acceptance of diversity and competitiveness among students and found it to be closely related to performance. The finding here agrees with Azrinawati (2013) who carried out a similar study aimed at identifying main factors that influence academic performance at the university of Tenaga Malaysia. Demographic factors, motivation, competitiveness and peer group factors were tested with performance in science and found socio economic status to be causal to academic performance. The finding of this study contradicts the report of Barry (2006) who also addressed the importance of students test scores by examining the different factors that influence test scores. Barry's test indicated that the strongest predictor of students test scores are motivation, difficulty, interest, satisfaction, teachers' support and school climate. The finding from the study is contrary to the report of Adewale (2012) who revealed relationship between friction and home-based environment factors and the academic performance of students.

In the analysis of data relating to the second research question where the students' gender was taken into consideration, it was found that the male and female students did not differ significantly in their scores on the variables. The finding is in agreement with Peter (2014) who looked at effect of gender on students' academic performance and revealed that gender had no significant effect on academic performance.

In the test of relationship where the variables were correlated independently for the male and female students, no significant relationship between the psycho-social factors and the performance of the male students was observed. But for the female

students, significant relationship between friction and performance was obtained. It was observed that friction was highly and negatively correlated with the performances of the female students. This finding is in agreement with the findings of Okebukola (2007) who investigated psycho-social factors of motivation, interest, cooperative learning and competition as a predictor to academic performance based on gender.

In the test of null hypothesis two where the psycho-social factors were tested as predictors of the students' academic performance independently for the male and female students, The results revealed that none of the psychosocial factors could be used as a predictor of the male students' academic performance. But for the female students, friction was found to be a negative and significant predictor. The findings of this study is contrary to the report of Studivant (2015) who reported a positive relationship between difficulty of work in class and performance gained for low ability girls however high ability girls showed significant relationship between subjects' difficulty and performance gained. This differs from the findings of this research work, this is probably because this is done in Europe and it was the Split Half method used to test ability and difficulty. The findings of this study show no difference between the mean scores of male and female students under the same classroom climate. Anderson (2007) also reported that students performed best when challenged. This also differs from his findings that recorded students' high level of assistance to competition in class.

The finding of this study is in conformity with other studies in Europe and America of Anderson (2007); Antecol et al (2012) and Azrinawati (2013).which have shown that conducive classroom environment is a predictor to academic performance in science. This means that there is significant relationship between psycho-social factor of difficulty and academic performance and gender. This indicated that

psycho-social factor of difficulty is gender friendly. This finding is in agreement with Peter (2014) who found that students academic performance in secondary schools of Eket Akwa Ibom State is non-gender specific. This is however in contradiction to Uloma (2007) where he recorded gender sensitivity in biology in Ebonyi State Senior Secondary Schools. The individual level of the psycho-social factors is also related, for example, the difficulty level in male and female students is not significantly different. This is in agreement with Kanit (2015) whose findings stated that male and female students in the same difficult classroom environment will exhibit the same academic performance in science.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the summary of the study, conclusion and recommendations were made. Specifically, the chapter is discussed under the following sub headings.

- Summary
- Summary of Major Findings
- Conclusion
- Contribution to Knowledge
- Recommendations
- Limitations of the study
- Suggestion for Further Studies

5.2 Summary

This study aimed at analyzing the psycho-social factors of classroom environment as a predictor to academic performance of Upper Basic Science students in Kaura Local Government Area of Kaduna State Nigeria. There are eleven government-owned secondary schools in Kaura Local Government Area with a population of 2510 Upper Basic Science Students. Kaura Local Government Area has eleven government owned coeducational secondary schools. Three of these schools were selected by purposeful sampling.

The importance of Basic Science as a bedrock for other science subjects and technological development of the nation cannot be overemphasised. It is unfortunate however, that the students' academic performance based on the examination results (Junior NECO, JSSCE) in Upper Basic Science is very poor (Krueger, 2010). It is worrisome because at this level, transition to senior secondary school is challenging.

Poor teaching method, observed by Igwebuikwe (2013) is the possible reason for the general decline in performance, but there are other factors like psycho-social classroom environment. This is why this research work is premised at checking the classroom behaviour of teachers. Analysis of classroom environment as a factor for academic performance is however sparse.

This study therefore determined to investigate the perceived psycho-social factors as a predictor to academic performance in upper basic science. Investigate the relationship between psychosocial environment and academic performance in upper basic science amongst the different gender. Based on these two objectives, two research questions and two hypotheses are formulated for answering. Determine the perceived psychosocial factors as a predictor to academic performance in upper basic science, investigate the relationship between male and female students. What is the relationship between the psychosocial factors of classroom environment as a predictor to academic performance in upper basic science? What is the relationship between psychosocial factors on academic performance in upper basic science and gender, while the Null hypotheses are, i. There is no significant relationship between students' psychosocial factors as a predictor to academic performance, ii. There is no significant relationship between students' psychosocial factors as a predictor to academic performance and gender. Relevant literatures were reviewed on the six factors of competitiveness, friction, difficulty, cohesiveness, satisfaction and socio-economic factors considered in this study. The research design is correlation study; data was collected using Basic Science Performance Test (BSPT) and Psycho-Social Classroom Inventory (PSCI).

A sample for this study comprised of 340 drawn from three secondary schools in each of the three chiefdoms, Moro'a Chiefdom, Kagoro Chiefdom and Fadan Atakar Chiefdom. They were selected using random sampling technique.

The basic science performance Test and the Psycho-Social Classroom Inventory were used as data for the study. The data was obtained by administering the psycho-social classroom inventory to respondents and the BSPT was administered for answering. The scores of the BSPT and PSCI were analysed using the regression analysis using the Statistical Package Software System (SPSS).

5.3 Summary of Major Findings

1. There is no significant relationship between psycho-social factors of classroom environment and academic performance in upper basic science.
2. There is no significant relationship between psycho-social factors of classroom environment and academic performance and gender.
3. Significant relationship exists between academic performance and psycho-social factor of friction

5.4 Conclusion

The following conclusions are drawn based on the findings from this study.

A socially and psychologically conducive classroom is a panacea to academic performance in our science secondary school science classrooms. Also, there is no difference in the mean scores of male and female students on psycho-social factors and academic performance.

From the research work, this study is important to educational research because the result suggested that the amount of friction and the degree of difficulty are in fact related and causal to upper basic science performance. The results further suggested

that educators pay careful attention to the degree of difficulty and the amount of friction in their classrooms.

5.5 Contributions to Knowledge

This study was conceived to seek ways of reducing students' poor academic performance in upper basic science in the junior secondary school level. Kolawole (2008) observed that the constant use of the lecture method of teaching, attitude of students and teachers towards integrated science, difficulty in managing large class-size, among others are the factors contributing to students' poor performance.

The implication and contribution to knowledge of this research for teaching and learning of upper basic science at the junior secondary school level are.

1. The instrument (PSCI) developed by the researcher for assessing psycho-social factors will be adopted readopted by other researchers.
2. The findings of the study contribute new information to the frontier of knowledge in the existing literature in basic science through seminars and workshops.
3. The findings of the study established that psycho-social factor of friction is a significant predictor of female students' academic performance in basic science.

5.6 Recommendations

Based on the conclusion from this study, the following recommendations are made.

1. This study did not showed significant relationship between psycho-social factors and academic performance in upper basic science, a socially and psychologically conducive classrooms should be encouraged in the face of the negative effects of friction on the students' performances for teaching and learning in the upper basic science Schools.

2. Adequate supervision of upper basic science teaching at the junior secondary school level by science educators, administrators and curriculum planners from time to time will help to enforce a socially and psychologically conducive classroom by giving necessary advice when needed.
3. Professional and research organisation like the Science Teachers Association of Nigeria (STAN) and the Nigerian Educational and Research Development Council (NERDC) should be carrying out seminars workshops and conferences to incorporate the psycho-social learning environment in their science curricula.
4. The federal and state ministries of education should sponsor upper basic science teachers for refresher training on conducive classroom environment studies and talks to improve performance of upper science students.
5. Based on the issue of poor performance in upper basic science, psycho-social factors of classroom should be encouraged as it influence and is related to performance in upper basic science through seminars, workshops on psycho-social classroom inventory test.

5.7 Limitations of the Study

The following were the limitations of this study:

1. JSS 1 students were not used in this study due to the fact that they were newly introduced to the upper basic science while JSS III students could not be used because they were busy preparing for their examinations.
2. This study was restricted to only three coeducational junior secondary schools in Kaura Local Government Area of Kaduna State Nigeria so the scope of the generalisation derived from this study is therefore fairly narrow.

5.8 Suggestions for Further Studies

1. Similar studies should be carried out in other psycho-social factors such as motivation, interest, teacher support, innovation, experiences of teachers, selection of curriculum and length of class time on task etc.
2. Longitudinal research should be conducted to determine students' perception of psycho-social climates. Perhaps a snapshot of classroom climate early in the year doesn't offer enough accurate data to compare with performance.
3. Random samples should be incorporated in similar studies. If larger sample with more variability would also be preferred.
4. Pre and post tests would be beneficial in future studies.
5. Further research is needed to determine whether there is similarity between the actual environment and that preferred by the students.

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APPENDICES

APPENDIX A

PSYCHO-SOCIAL CLASSROOM INVENTORY

Dear Respondent,

This is not a test. The questions are to find what your class is actually like each sentence is meant to describe what your actual classroom is like. Draw a circle around Yes if you AGREE with the sentence or not if you DON'T AGREE with the sentence. Example

Most pupils in our class are good friends

If you agree that most pupils in the class actually are good friends, circle the yes, like this Yes No

If you don't agree that most people in the class are actually good friends circle the No like this Yes No

Please answer all questions if you change your mind about any answer just cross it out and circle the new answer

	Remember you are describing your actual classroom	Circle answer your
Satisfaction	1.1 enjoy the schoolwork in my class 2.1 am not happy in my class 3.1 don't like my class 4. my teacher is friendly 5. my class is fun	Yes No Yes No Yes No Yes No Yes No
Friction	1. my classmates always fight with one another 2. Some of my classmates are mean 3. many pupils in my class like to quarrel always 4. Certain pupils always want to have their own way 5. My classmates fights a lot	Yes No Yes No Yes No Yes No Yes No
Competitiveness	1. My classmates often race to see who can finish first 2. Most of my classmates want their work to be better than their friend's work 3. Some of us feel bad when they don't do as well as the others 4. Some pupils in my class always try to do their work better than the other 5. Few pupils in my class want to be better than others	Yes No Yes No Yes No Yes No Yes No

Difficulty	<p><u>1.1</u> find basic Science as a subject very difficult to understand</p> <p><u>2.1</u> cannot do my Basic Science homework without external help</p> <p>3. My classmates always help me in my basic Science class work</p> <p>4. Basic Science textbooks are difficult to read and understand without external help</p> <p>5. I find it difficult to solve simple problems in basic science</p>	<p>Yes No</p> <p>Yes No</p> <p>Yes No</p> <p>Yes No</p> <p>Yes No</p>
Comprehensiveness	<p><u>1.1</u> am a friend to everybody in my class</p> <p><u>2.1</u> am not a friend to all my classmates</p> <p><u>3.1</u> tolerate all my classmates</p> <p>4. I assist all my classmates when they are in difficulties</p> <p>5. I am a member of my class social club</p>	<p>Yes No</p> <p>Yes No</p> <p>Yes No</p> <p>Yes No</p> <p>Yes No</p>

APPENDIX B

BASIC SCIENCE PERFORMANCE TEST (BSPT)

DEAR STUDENTS,

This instrument Basic Science Achievement Test is not to be recorded in your examinations scores, please answer it as freely as you can thank you,

1. Which of the following is not polluted water
 - a. Colourless b. Tasty c. Coloured d. Smelly
2. Which of the following is not a cause of water pollution?
 - a. Adding alum b. putting fertilizer c. washing of cloths d. farming
3. Which of the following is not an industrial waste?
 - a. water from washing clothes b. water from farming c. water from toilet d. water from fertilizer plant.
4. Which of the following is a domestic waste?
 - a. water from washing clothes b. water from farming c. water from toilet d. water from fertilizer farm
5. Which of the following is an agricultural waste?
 - a. water from washing clothes b. water from farming c. water from toilet d. water from fertilizer farm
6. Which of the following is not a characteristic of spillage?
 - a. water from the factory b. oil from the factory c. water from the farm d. oil from the farm
7. Insecticides are?
 - a. insect that bites people b. use for making medicine c. used for farming d. used for killing insects
8. Air is said to be polluted when?
 - a. when you cannot breathe b. when the air is saturated with waste c. when the air is not blowing d. when the air is blowing too fast
9. The following are sources of air pollution except?
 - a. burnt paper b. burnt grass c. dead animals d. rainfall
10. Which of the following is not an effect of air pollution?
 - a. acid rain b. global warming c. greenhouse effect d. rainfall
11. Which disease is the consequence of air pollution? a. blindness b. cancer c. diarrhoea d. malaria

12. The following animals can be found in fresh water habitat except? a. fish b. frog c. tortoise d. cow
13. These disease can be caused by drinking contaminated water except a. scabies b. river blindness c, malaria d. bilharzias
14. Which of these is not a characteristic of pure water? a. colourless b. odourless c. hard d. tasteless
15. A vector is?
a. a means of measurement b. means of carrying disease c. name of disease d. none of the above
16. The following disease are transmitted through a vector except a. yellow fever b. river blindness c. sleeping sickness d. madness
17. Clean water is obtained from the following except? a., well b. stream c. river d. gutter
18. Acid rain is caused by
a. water pollution b. air pollution c. acid from the laboratory d. insecticides
19. Hard water is not one of the following
a. drinkable b. does not form lather with soap c. is an industrial waste d. contaminated water
20. Unclean water is found from the following except a. gutter b. stagnant water c. well d. flood

APPENDIX C
BASIC SCIENCE PERFORMANCE TEST
MARKING SCHEME

1. A
2. A
3. C
4. C
5. D
6. C
7. D
8. B
9. D
10. D
11. B
12. D
13. C
14. C
15. B
16. B
17. D
18. B
19. A
20. C

APPENDIX D

PARENT/GUARDIAN SOCIAL-STATUS CONSENT FORM

I _____ (your name, related to the subject as
_____ parent _____ guardian

agree to be participation

of _____ (your child's name) in this study. I have read and understand the risk and benefits of this study. I understand that my child or I may later refuse to participate. And that my child through his's/her's own action or mine in my withdrawal from this study at any time will not attract any adverse consequence. I have received a copy of this consent form for my own records and I understand no one will know my child's individual result from this study.

.....
Parent/Guardian signature **Date**

.....
Researcher's Signature **Date**

As one component of the survey it will be helpful if you could provide the following information regarding income. This information is entirely optional. Please check the box that best indicates your family total income

- | | |
|---|---|
| <input type="checkbox"/> less than N20, 000 | <input type="checkbox"/> N20, 000 to N39, 000 |
| <input type="checkbox"/> N40, 000 to N59, 000 | <input type="checkbox"/> N60, 000 to N79, 000 |
| <input type="checkbox"/> N80, 000 to N99, 000 | <input type="checkbox"/> N100, 000 to N150, 000 |
| <input type="checkbox"/> Over N150, 000 | |

Student Assent Form

I _____ (your name), agree to participate in this study, I have read and understand what it is about.

That may change my mind and later refuse to participate. Have received copy of this consent form, and I understand that no one but Mutum YA know the answers to my questions.

.....
Students signature Date

.....
Researchers signature Date

APPENDIX E

SUMMARY TABLE FOR ITEMS ANALYSIS OF THE INSTRUMENT

S/n	F ₁	D ₁
1	0.30	0.40
2	0.30	0.60
3	0.40	0.70
4	0.30	0.43
5	0.40	0.41
6	0.42	0.41
7	0.42	0.46
8	0.45	0.50
9	0.20	0.23*
10	0.30	0.70
11	0.40	0.50
12	0.20	0.29*
13	0.40	0.70
14	0.50	0.72
15	0.90	0.91**
16	0.30	0.50
17	0.92	0.93**
18	0.31	0.61
19	0.35	0.60
20	0.41	0.70
21	0.31	0.79
22	0.40	0.61
23	0.30	0.70
24	0.39	0.69
25	0.86	0.88**

Note that question 9 and 12*, were dropped because they were found to be very difficult below 0.3 scores hence rejected while question 15, 17 and 25**, were also dropped because they were found to be very simple, that is those above 0.70.