STUDENTS' SITUATIONAL INTEREST AND ATTITUDE TOWARDS LEARNING BASIC SCIENCE AND TECHNOLOGY AT UPPER BASIC EDUCATION LEVEL IN NIGER EAST SENATORIAL ZONE

BY

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MINNA, NGER STATE

AUGUST, 2023

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A THESES SUBMITTED TO THE POSTGRADUATE SCHOOL FEDERAL UNIVERSITY OF TECHNOLOGY MINNA, NIGER STATE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF TECHNOLOGY (MTech) IN SCIENCE EDUCATION

AUGUST, 2023

DECLARATION

I hereby declare that this thesis **titled "Students' Situational Interest and Attitude towards Learning Basic Science and Technology at Upper Basic Education Level, in Niger East Senatorial Zone"**, is a collection of my original work. It has not been presented for any other qualification anywhere. However, information from the works of other scholars (published or unpublished) and their contributions here have been duly acknowledged.

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SIGNATURE & DATE

CERTIFICATION

This thesis titled: **"Students' Situational Interest and Attitude towards Learning Basic Science and Technology at Upper Basic Education Level, in Niger East Senatorial Zone"**, by SALIHU, Mohammed Abdullahi (MTech/SSTE/2018/9319) meets the regulations governing the award of the degree of Master of Technology in Science Education of the Federal University of Technology, Minna and it is approved for its contribution to scientific knowledge and literary presentation.

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DEDICATION

This research is dedicated to my beloved parents and my wife for their encouragement, prayers and inspiration throughout the period of this study.

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ABSTRACT

The study investigated the Students' Situational Interest and Attitude towards Learning Basic Science and Technology at Upper Basic Education Level in Niger East Senatorial Zone. Descriptive survey designed was used for the study. Six research questions were raised to guide the study and four corresponding hypotheses were formulated and tested at 0.05 level of significance. The population of the study was sixty-five thousand four hundred and twelve (65,412) students in 2021/2022 Academic session. The sample for the study was made up of three hundred and eighty two (382) J.S.S. 3 students which were selected using Proportionate stratified random sampling technique. The questionnaire was used as instruments with name, Basic Science and Technology Situational Interest Questionnaire and Basic Science and Technology Student Attitude Questionnaire (BSTSSIQ & BSTSAQ) respectively, it was divided into section A, B and C. Section A comprised of bio-data of the respondent, section B comprised 20 items on situational interest while section C comprised 20 items on attitude of basic science and technology students: Five point Likert Scale of Strongly Agree (SA), Agree (A), Undecided (U) Disagree (D) Strongly Disagree (SD) with 3.0 as decision mean was used. The reliability of the research instruments was determined after conducting a pilot study on the 49 students in Minna. The following reliability coefficients of 0.78 and 0.77 were obtained for situational interest and attitude respectively showing that there is consistency in the items of the survey. Mean, standard deviation and Mean ranking were used to answer research questions, while, Mann-Whitney U-test was used to analyze research hypotheses. Mann-Whitney U-test revealed that p-value = 0.00, since, $p < 0.05$, HO_1 was accepted indicating a significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level in favour of female students. However, Mann-Whitney U-test showed p-value = 0.369, since, $p > 0.05$, HO_3 was accepted implying no significant difference between the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level. It was recommended among others that, upper basic education teachers should give utmost priority to teaching basic science and technology at upper basic education level especially in the present day of professional best practice of self -reliance.

TABLE OF CONTENTS

CHAPTER TWO

LIST OF TABLES

LIST OF FIGURES

APPENDICES

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

Studentship is as old as man himself. This is because, it is a phenomenon known to have existed right from time immemorial. Studentship, cuts across all ages beginning from a very tender period of any individual person to the time of death.

Interest has always been an important research object in the field of education. So also, understanding the role of interest in students' classroom learning is conducive for teaching practices. Interest is seen as the feeling of wanting to give attention to something and to discover more about it. The focus of this study in terms of interest is the situational interest which is a key variable. Situational interest refers to a short-term spike in a person's attention and participation in an activity and it is triggered by features of the environment (Renninger & Hidi, 2016). For example, in the context of college mathematics activities, (Harackiewicz *et al.,* 2015) found that students had triggered situational interests in response to elements of novelty, complexity, and uncertainty designed into instructional materials.

Similarly, in several inquiry-based lessons focusing on various topics in the physical sciences, Palmer (2016) found that students, situational interests were triggered due to factors such as opportunities to learn a new topic or investigation technique, choice deciding where to steer investigations, novelty, and physical activity actively doing something. Outside formal classroom arrangements, research has found similar results. For instance, 17 to 19 years old students visiting an aquarium had triggered interests due to novelty, surprise as in uncertainty, unusualness of a situation, and hands-on aspects of the activity e.g., handling fish and crabs and their participation changed as they were differentially exposed to these elements. Likewise, participants in a biology workshop had

triggered situational interests in response to such factors as social interactions, autonomy, hands-on work actively manipulating something, and the use of computer technology, as well as a combination of multiple factors (Renninger & Bachrach, 2015).

They further noted that extant notions or conceptions of situational interests frame the phenomenon fundamentally as a discontinuity in a person's experiences. On the other hand, a situational interest captures or denotes a moment in which a new activity is first brought into a person's stream of experiences. Renninger and Bachrach (2015) reported that, experiences that trigger interest are unexpected and ephemeral, and participants may not be reflectively aware that their interest has been triggered and this triggering does not last long, because the learners are unaware. Indeed, the language of triggering itself highlights a different before-and-after in the flow of a person's activity. For example, when a teacher gives story/display something to arose students' interest before presenting the topic at hand (Rotgans & Schmidt, 2017).

Triggering marks, the boundary of some kind of discontinuity between two different moments in one's ongoing activity participation. In teaching and learning, the main focus is the target audience who are the students whose attention need to be captured in order to arouse their interest towards a particular topic to be delivered by the teacher. In fact, understanding activity continuities is essential to grasping how new experiences such as emergent, situational interests are appropriated into one's existing repertoire of activities and practices (Joseph, 2017). The literature, advances the conjecture that situational interests are best understood as phenomena that combine both continuous and discontinuous dimensions of experience.

Theoretically, a focus on activity continuities dated back to Vygotsky (1978) formulation of human developmental processes and cultural psychology in activity theory (Huskinson & Geoffrey, 2018). All of these sees humans as constantly participating in several

concurrent activities that their interest focus on. Furthermore, these activities bear complex relationships to one another. According to Jean (2019), situational interest is characterized by its association with an external factor to which an individual is exposed and participates in an interaction. The situation may produce a positive feeling or a negative one depending upon situation at hand. In the school context, situation may involve, specific knowledge to which students are exposed or the tasks in which they are involved. This psychological state involves focused attention, increased cognitive functioning, persistence and affective involvement.

Another characteristic of this type of interest is that even if it is transitory, under some conditions it can provide the basis for longer situational interest, when situational interest is maintained over time, or when it occurs repeatedly in response to the same stimuli, it possibly lead to long-term interest, increased knowledge, changes in values and consistent positive feelings. In an extensive review, it shows that, situational interest can contribute to the development of long-lasting personal interest. In other words, certain conditions in the learning environment can do more than momentarily catch one's interest, and also holding it (Ereh, 2016). The above statement, is said to be that, if situational interest is sustained by conditions in the learning environment, it may lead to intrinsic motivation and individual interest.

Another important variable of this study is Attitude. Attitude refers to a learned tendency of a person to respond positively or negatively towards an object, situation, concept or another person (Sarmah & Puri, 2014). Attitudes can change and develop with time and once a positive attitude is formed, it can improve students' learning (Syyeda, 2016). On the other hand, a negative attitude hinders effective learning and consequently affects the learning outcome henceforth performance (Joseph, 2017). Therefore, attitude is a fundamental factor that cannot be ignored. The effect of attitude on students' towards

learning Basic Science and Technology might be positive or negative depending on the individual student. In response to this problem, this study seeks to investigate students' attitude towards learning Basic Science and Technology at Upper basic education level, in Niger East Senatorial Zone.

In accordance with Syyeda (2016) attitude has three main components: affection, cognition and behaviour. The components are interrelated and involve several aspects contributing to the overall attitude towards learning. Walberg's theory postulates that individual students' psychological attributes and the psychological environments surrounding them, influences cognitive behavioural and attitudinal learning outcomes.

For instance, an attitude is seen as a state of mental or neural readiness both as the premise and the consequences of behaviour. This is as a result of tendencies of emotions, thoughts and behaviors that emerged due to previous experiences. Attitudes, which are not directly seen but can be observed through behaviours, give direction to human behaviours. They are phenomenon that can differentiate decision-making, problem-solving processes, as well as all interactions, and that can lead to bias (Abe & Gbenro, 2014). In other words, just as a positive response, a positive attitude can affect the approach to the events and phenomenon differently. This could be negative reaction with a negative attitude or positive reaction with positive attitude. Leaners are expected usually, to display feelings and thoughts in terms of learning environment and learning processes with appropriate or inappropriate behaviors in accordance with the expectations of the environment (Blazar, & Kraft 2017). The attitudes of students towards learning is paramount to the development of learners in all sphere of life as stated by Saif and Aseri (2017) that, there is no significant difference in attitudes towards learning between males and females.

Research studies on attitude have gained much attention in the realm of science especially from the teaching and learning perspective. Students negative attitude towards science and technology is related to tradition or religious view points, but their positive feelings is related with their situational condition that is been triggered by the environmental stimuli. Science has become a very important part of Nigerian educational curriculum due to the quest for advancement in the area of technology. The most populous subject that are being offered in the making of the sciences at basic level are, Basic science, Introductory technology, Agricultural science and Information Technology (Elom & Okoli, 2014).

The areas of emphasis in the new 9-year basic education curriculum are: value reorientation, basic science, basic technology, computer science, teaching of thinking, home economics, agricultural sciences, business studies, civic education, French. Basic science is a science subject taught in lower, middle, and upper basic schools. Basic science and Technology, in junior secondary school is a course of study which is devised and presented in such a way that students gain the concept of the fundamental unity of science, the commonality of approach to problem of scientific nature and are helped to gain an understanding of the roles and functions of science in everyday life and the world in which they live. (Sambo, 2015; and Sambo, 2018a; Sambo, 2018b) stated that basic science is the bedrock to understand, advance studies in science, technology and engineering.

The new Basic Science and technology curriculum is different in many ways from that currently in use. The new Basic Science programme has necessitated curriculum change and innovation as a result of the desire for the improvement and transformation of the educational system. The Basic Science and Technology Curriculum component assumes a prominent position in the overall Curriculum because topics in Basic Science and technology constitute core or compulsory content of the curriculum from lower Basic

through Middle to Upper Basic levels. It would be seen that the foundation of any reform in Nigeria is not in the policy or curriculum but rather in the implementation of the programme (Federal Republic of Nigeria (FRN), 2013). This perhaps is the aspect where significant lapses may occur in the achievement of the curriculum.

Igbokwe (2015) opined that, recently in Nigeria that there has been a review of Universal Basic Education curriculum by the Nigeria Educational Research and Development Council (FRN, 2014). However, despite that ascension there is not readily accessible detailed roadmap for Teachers. Changes to the junior secondary school curriculum were introduced in 2011 and supposedly featured a learner-centred and competent based approach to education, (NERDC 2015). The curriculum un-equivocally emphasize on skill base subjects, and these skills-based subjects that encourages learners to improve their living conditions by using local initiative and improvised resources at their disposal for the creation of valuables, thereby making the youth competent to compete favorably in a constantly changing global economy (Igbokwe, 2015).

Basic science and Technology curriculum materials such as teacher's guides, handbooks and manuals should be designed to improve teacher quality as one potential vehicle towards supporting them (Sambo, 2018b). These curriculum materials have been infused into every class of Basic 1-9 Introductory Technology has also been introduced at the lower (primary 1-3) and Middle (primary 4-6) Basic levels. It is noteworthy that Basic Science and Technology offered at the lower and Middle Basic Education levels in Nigeria is separated at the Upper Basic Education level (JS1- JS3) to provide students with appropriate experiences in science and technology in order to achieve the objectives of the Science and Technology Curriculum. The overall goal is to ensure the development of strategies by learners to live effectively within the global community. Knowledge, skills and attitudinal requirements are addressed under these four themes which are: You and

environment, living and nonliving things, you and technology and you and energy (Federal Government of Nigeria (FGN), 2018).

The disarticulation of JSS from SSS in order to ensure the existence of two separate administrations in the existing secondary schools would not only require more qualified teachers, it would also entail the provision of additional infrastructures in the junior secondary school. There is the need for new laboratories especially if students had been sharing laboratories with the senior secondary school students. This would enable the exposure of J.S.S students to practical laboratory experiences, acquisition of science process skills, scientific attitudes in their basic science and technology subjects without any hindrance (Sambo, 2018a).

The role of Basic Science and Technology is widely recognized as an important tool for fostering and strengthening the economic and social development of any nation at initial stage. Given the rapid pace of globalization, fast-depleting resources, increasing competition among nations and the growing need to protect intellectual property, the importance of strengthening the knowledge base of every nation is an important issue that needs to be recognized. This is because science is dynamic and essentially concerned with the search and explanation of both regularities and irregularities in nature. It involves the quest for actions and reactions, causes and effects in the environment. Furthermore, the research by Hasni and Potvin (2015) reveals that, the purpose of science is to transform the environment towards improving the general quality of life, thus making the world a better place. Many studies related to this issue have been conducted over the past decades, addressing various aspects of interest in science and technology and progressively building knowledge in this field. Analysis of these studies and related syntheses shows that while a lot has been learned about interest, further research is still needed, particularly in different

cultural and educational contexts since interest seems to depend on these contexts with a focus on classroom teaching methods. Review on attitude toward Basic science and technology, shows that there is a greater need for research to identify those aspects of science teaching that make school science engaging for learners (Syyeda, 2016). Other authors have also pointed out the need to develop research and tools that simultaneously take into account a number of interest-related components. The basic science and technology that is formal, involve a systematic study of natural phenomena and it allows students to experience the richness and the excitement of the natural world, as they engage in inquiry, critical thinking and the demonstration of skills (Sambo, 2018b).

This implies that scientific enterprise is one that is challenging and innovative, it blends with technology which focuses on inventions and problem solving. Consequently, the harmonious interplay of science, technology and society is the springboard for sustainable development. It equally facilitates and enhances industrial and technological progress among the people and within a nation. This consciousness stems into global agitations for literacy in science and technology (Hasni & Potvin, 2015). Pupils' interest has been one of the major concerns in science education research because it can be seen as a gateway to more personalized forms of interest and motivation towards science and technology (Palmer, 2016).

This is the reason why Basic Science and Technology Education Policy of Nigeria lays out policy direction as to how Basic science and Technology would be taught (pedagogy) and assessed, the need for pre-service and in-service teachers' of Science and Technology, teacher demand and supply, provision of science equipment and laboratories, workshops, equipment, textbooks and other resources in educational institutions. Equally covered in the policy are plans and strategies for technology and vocational enterprise, the total sum

of which will crystallize into an efficient business and industrial environment that can task the creativity of citizenry for national development. The Policy lays a more solid foundation on the basis of which Nigeria shall accelerate her industrial and technological development (FGN, 2018).

Education can be described as the process through which learners are helped to cultivate and grow their abilities, attitudes, values and other forms of behavioral attributes that represent positive value aimed at changing the individual to enable him/her contribute to the well-being of humanity (Amadioha & Akor, 2019). This implies that education grows, advances and has the capability to induce a person with characteristics that would make the person function properly. The capacities developed through education are usually of value that enables the person to contribute positively to the development of the society. Educational process in Nigeria is broken into stages as enumerated by Federal Republic of Nigeria to include early childhood education, basic education, secondary education, mass literacy, adult and non-formal education, science education, technical and vocational education, tertiary education as well as open and distance education (FRN, 2014). Science education is an important area in education because it improves science and technology education and increase the scientific development in higher education and other related fields. One of the fields to achieving the desired curriculum is attitudes of students towards science and technology. Knowing and awareness of these areas would enable science curriculum planners to develop better and appropriate curricula. Indeed, concerning element of learner in curriculum development is based on the theoretical background that considers learner, knowledge and society in general (FGN, 2018).

Basic education according to Kanno and Onyeachu (2015) is defined as the foundational educational level. This may also by implication be seen and perceived as the most

fundamental level of education that is given to people. On the other hand, Madu and Orji (2012) sees basic education as the base-line education on which all other educational advancement rest upon. The basic education in this context is seen as the foundation of a building on which all other loads for the building rest upon. This same foundational education from inference determines the stability of the entire educational building that anyone can ever have. Therefore, basic education is to a large extent what determines the success or failure of all other stages or levels of education that may come after it. Hence, it becomes imperative to make this educational level functional to produce results worthy of the effort inputted by the education implementers.

Basic education in Nigeria has its roots in the original educational system put together for Nigeria by the British starting from when Reverend Thomas Birch Freeman and Mr. and Mrs. Degraft of the Wesleyan Methodist Church arrived in Nigeria precisely in Badagry and established a private home school (Amadioha, 2016). This basic educational process has spanned from 1842 to this present day such that it has graduated from the (3Rs), Reading, Writing and Arithmetic to the Universal Primary Education (UPE) Programme that was on the front burner as at the time between 1955 for the Western region of Nigeria under the leadership of Pa Obafemi Awolowo, 1957 for the Eastern region under the leadership of Dr Nnamdi Azikiwe to the general UPE that resurfaced in 1976 under the leadership of General Olusegun Obasanjo and then to the present day UBE (Universal Basic Education), as stated by Amadioha (2016); as well as Jeremiah and Alamina (2017). The Education act 2004 unequivocally stated that the educational system at the basic level, would be free and compulsory for every Nigerian child who is of school age (Amadioha & Akor, 2019). This bold declaration actually supports and agrees with the dictates of the National Policy on Education (FRN, 2014) which is to achieve the goals of Education for All through the following objectives of the UBE programme:

a. develops permanent literacy and numeracy, and ability to communicate effectively.

b. lay a strong foundation base for scientific and reflective thinking.

c. gives citizenship education as a ground for effective participation and contribution to social life.

d. mold character and bind sound attitude and morals in the child.

e. develops in the child, the ability to adapt to the child's environment.

f. gives the child opportunities for developing manipulative skills that will enable the child to function effectively in the society within the limits of the child's capacity.

g. provides the child with basic tools for further educational advancement including preparation for trades and crafts of the locality.

Judith and Paul (2021) opined that gender differences in non-cognitive traits, behavior, and interests have been shown to relate to differences in educational outcomes; however, this evidence cannot generally be given a causal interpretation. In contrast, the literature has been creative in estimating causal impacts of a wide range of factors using experimental and quasi-experimental variation. While the approaches are compelling, the findings vary widely across studies and are often contradictory. This may partly reflect methodological differences across studies but also may result from substantial true heterogeneity across educational systems and time periods.

Academic performance is a composite term that refers to both pupils' ability and performance. It is inextricably linked to human growth and cognitive, emotional, and social physical development; it represents the whole child; it is not confined to a single event, but happens across time and levels throughout a students' school and working life (Faure, 2015).

Abubakar and Adegboyega (2012) found a favorable association between location and academic performance across secondary schools. However, location was found to be

insignificant in term of students' academic performance, but location was found to be the greater predictor of academic performance. In light of the foregoing, John *et al.* (2015) lamented that a students' chronological location had a significant impact on his or her academic performance, such that the youngest student had the potential to outperform the oldest on a teacher created test.

It is on the bases of the forgoing, that this research study aimed at determining the Students' Situational interest and attitude towards Learning Basic and technology at Upper Basic Education level, in Niger East Senatorial Zone.

1.2 Statement of the Research Problem

Situational interest is a multi-dimensional concept with five indicators: Novelty, Optimal challenge, Attention demand, Exploration intention, and Instant Enjoyment (Judith & Paul, 2021). This research is aimed at pro-offering solution to this problem. Low participation and thus poor performance in basic science and technology related subjects and despite the importance of basic science and technology in Nigerian schools, the decline of students' interest in basic science and technology related subjects and poor performance at internal and external examinations has been of a significant concern (Amadioha & Akor, 2019).

Students encounter problems in comprehending some abstract and difficult concepts for example isometric drawings, soldering, and chemical bonding in basic science and technology subjects due to various factors which include but not linked to overcrowding, lack of instructional materials, teachers pedagogical content knowledge, situational interest to mention few (Amadioha, 2016). Some of these factors may be responsible for the poor performance recorded in the Basic Education Certificate Examination (BECE NECO for Niger state) from 2018 to 2022 academic session, shows un-stable and series of backdrop on the percentage performance over these years. See Table 1.1.

National Examinations Council (NECO)

5/23

Performance of Candidates in Basic Science & Technology, BECE 2018-2022

Niger State Only

S/No	Year	Candidates Sat	A	B	C	P	F
1	2018	6,365	4 0.06%	399 6.26%	2,569 40.36%	2,875 45.16%	917 14.40%
2	2019	5,890	8 0.13%	704 11.95%	2,769 47.01%	2,570 43.63%	543 9.21%
3	2020	6,378	17 0.26%	546 8.56%	2,888 45.28%	2,722 42.67%	751 11.77%
4	2021	6,668	7 0.10%	446 6.68%	3,451 51.75%	2,714 40.70%	496 7.43%
5	2022	5,543	605 10.91%	1,269 22.89%	2,222 40.08%	1,680 30.30%	1,036 18.69%

Figure 1.1: Performance of Candidates in Basic Science and Technology, BECE 2018-2022 Niger State
Source: (NECO, 2022)

Though, several studies have been carried out in interest and attitude of students towards learning science technology at secondary education level. At basic educational level, variables like gender difference were not given much considerations on the previous works done in Nigeria. The researcher therefore found it necessary to carry out study with focus on these variables. Therefore, this study is aimed at investigating the students' situational interest and attitude towards learning basic science and technology at upper basic education level, in Niger East Senatorial Zone.

1.3 Aim and Objectives of the Study

The study is aimed at investigating students' situational interest and attitude towards learning of basic science and technology at upper basic education level, in Niger East Senatorial Zone. Specifically, the study intends to achieve the following objectives:

(i) Examine the situational interest students possess towards learning basic science and technology at upper basic education level.

(ii) Determine the attitude students possess towards learning basic science and technology at upper basic education level.

(iii) Find out whether there is gender difference on students' situational interest towards learning basic science and technology at upper basic education level.

(iv) Find out whether there is gender difference on the students' attitude towards learning basic science and technology at upper basic education level.

(v) Find out whether students location influences the situational interest of students towards learning basic science and technology at upper basic education level.

(vi) Examine whether location influences the attitudes of students towards learning basic science and technology at upper basic education level.

1.4 Research Questions

The following research questions were raised to guide the study:

(i) What is the students' situational interest towards learning basic science and technology in upper basic education level?

(ii) What is the students' attitude towards learning basic science and technology at upper basic education level?

(iii) Does any difference exist between the female and male students' situational interest towards learning basic science and technology at upper basic education level?

(iv) Does any differences exist between the female and male students' attitude towards learning basic science and technology at upper basic education level?

(v) How do students' school location influence their situational interest towards learning basic science and technology at upper basic education level?

(vi) How do students' school location influence their attitude towards learning basic science and technology at upper basic education level?

1.5 Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 significance level.

HO_1: There is no significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level

HO_2: There is no significant difference between the female and male students' attitude towards learning basic science and technology at upper basic education level.

HO_3: There is no significant difference between the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level.

HO_4: There is no significant difference between the attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level.

1.6 Scope of the Study

The scope of the study covered Niger East Senatorial Zone, which comprised of Bosso ,Chanchaga, Gurara, Munya, Paikoro, Rafi, Shiroro and Tafa Local Government areas. Therefore, the study will be limited to all the upper basic Schools in Niger East Senatorial Zone of Niger State, Nigeria.

In addition, the study is limited to situational interest and attitude of students on learning basic science and technology at upper basic education level concept.

The study is limited to students' situational interest and attitude on learning of basic science and technology at upper basic educational level, in Niger East Senatorial Zone. The study lasted for six weeks.

1.7 Significance of the Study

It is expected that after this study, the learning process, students, teachers, teacher trainees, researchers and the nation at large would benefit from the findings. These are further enumerated as follows:

To the learning process, the findings from the research are expected to have a positive impact on students' interest and attitude as well as active participation and engagement in learning in the sense that each member of a team is expected not only to learn what is taught but also to help teammates learn, thus creating an atmosphere for an individual and group improvement in situational interest.

To the teachers, the findings from the study would stimulate and encourage basic science and technology teachers' innovativeness, resourcefulness, ingenuity and challenge them to adopt situational interest learning strategy as an effective teaching and learning approach. Science and technology teachers would also benefit from the findings of this study because it would provide some positive approaches to teaching of abstract and difficult science and technology concepts if they are exposed to the findings of this study.

To the teacher trainee, it is also hoped that the findings from this study would attract the attention of teacher training institutions to incorporate a teacher education programme in Nigeria. Consequently, these may raise the interest of the student towards learning of basic science and technology at upper basic level of education in Niger State and Nigeria Educational sector.

To educationist, the findings from this research are expected to serve as a reference point to academics/researchers by providing them with helpful information on future research studies on situational interest and attitude. In addition, it would provide empirical evidence

in their quest for further research work on situational interest and attitude of students towards learning complex science concepts.

To the nation, the findings of this study would also assist the federal ministry of education to advice the government on policies regarding the development of education sector of the nation.

1.8 Operational Definition of Terms

The following terms were defined as used in the study:

Basic education: the education given to children or students at the early stages of their development at both pre-basic (Nursery 1 to 3) and post-basic (Primary 1 to JSS 3).

Situational interest: a person's attention and participation in any activity which triggers interactions between the person and his /her environment.

Attitude: the manner the student or learner thinks or reacts to situations and emotional feelings exhibited towards learning about science and technology.

Learning: the processes of acquiring knowledge, behaviors, skills and preference.

Lower Basic: refers to as education given to children enrolled in basic 1 – 3 (Primary 1-3).

Upper Basic: the education given to children enrolled in basic 7- 9, (J.S.S 1 - 3).

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter reviewed literature related to the variables of interest to the researcher under the following sub-heading: Conceptual framework, theoretical framework, empirical studies of related literature and summary of literature reviewed.

The conceptual framework of this study focuses on explaining the concepts that make up the topic of interest in an understandable way that will bring about an easy breakdown of the subject matter as shown in Figure 2.1.

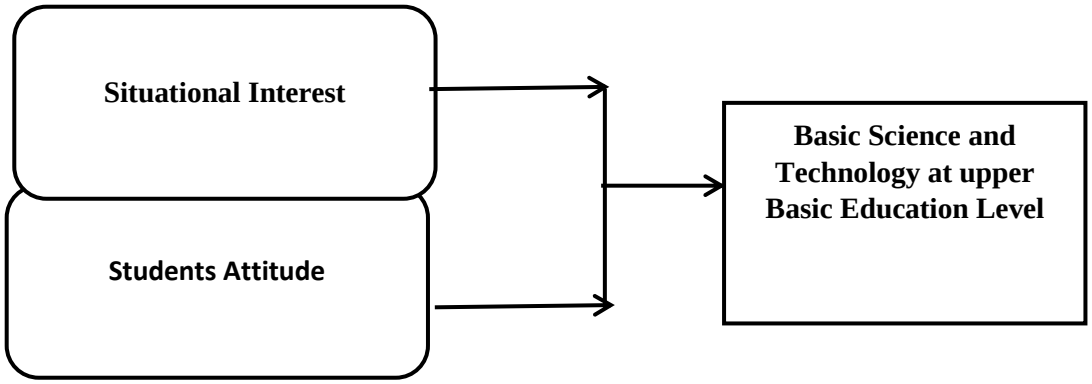

Figure 2.1: Diagram of Conceptual framework variables

2.1 Conceptual Framework

2.1.1 Situational interest and science education

The term situational interest was used by Renninger and Hidi (2016) to refer to transient interest that is generated by aspects of a particular situation. For example, a spectacular science demonstration could arouse this type of brief interest, even among students who are not normally interested in science.

A wide range of activities have been found to generate situational interest in a variety of subject areas. Mitchell (2015) reported that puzzles, group work and computers could stimulate situational interest among mathematics students. Durik and Harackiewicz (2016) concluded that the use of a novel, visually stimulating notebook technique that featured

colourful pages, cartoon-like images and varied fonts, could generate situational interest among college students.

Nieswandt *et al.* (2017) studied grade 9 students in chemistry and found that situational interest could be aroused by hands-on activities, demonstrations and everyday life applications. Dohn (2019) investigated an undergraduate physiology course and found that live animals such as a guinea pig and cane toad were triggers for situational interest. Logtenberg *et al*. (2015) reported that narrative and problematising texts provoked more situational interest than expository text. Bulunuz (2012) found that higher levels of inquiry in hands-on activities captured the interest of preservice primary teachers. Tapola *et al*. (2016) reported that a concrete version of a simulation generated more situational interest than an abstract version. Renninger and Hidi (2016) reviewed previous studies and concluded that novelty, in the form of unusual, incongruent, or surprising experiences, played a central role in arousing situational interest. However, they noted evidence that other factors such as the personal relevance of the content and active participation in learning were also important.

2.1.2 Situational interest in education

Interest research is growing in educational psychology (Ainley & Hidi, 2014; Krapp, 2017). One of the possible explanations for this surge in curiosity is that interest is a construct that oddly seems to manifest itself through two quite different identities. Interest is sometimes considered a semi-stable construct representing the dispositional tendencies of a person to engage with a subject over time, or, alternatively, a transient phenomenon that is temporarily aroused by contextual stimuli in the learning situation. The latter is referred to as situational interest, whereas the former is generally referred to as personal or individual interest (Bergin, 2019; Renninger & Hidi, 2016; Nieswandt *et al.*, 2017). An

answer to this question is useful because if more would be known about the mechanism of interest development, teachers would be in a better position to influence students' interest in subjects for which many have little affinity. A model describing how individual, stable, interest emerges out of situational interest was proposed by Renninger and Hidi (2016).

According to Hidi and Renninger, interest develops over four sequential phases. The first phase is called "triggered situational interest" and entails that a person's situational interest for a particular topic can be sparked by presenting features such as novelty or surprising information (Renninger & Hidi, 2016). These features can be induced by activities of the teacher or presented by means of texts or other learning resources. The second phase is referred to as "maintained situational interest." The third phase marks a transition to individual interest and is referred to as "emerging individual interest." This phase is characterized by a dispositional internalization of a person's interest for the topic in question and a tendency to seek out more frequent engagements with the topic without much external support. According to Hidi and Renninger, the last phase is referred to as "well-developed individual interest" and signifies a person's deep-seated interest for the topic, manifesting itself by a dispositional tendency to reengage with the topic over longer periods of time and without external support.

2.1.3 Students' attitude towards basic science and technology

Attitude is a tendency which is attributed to individuals and creates ideas, feelings and behaviors about a psychological object in an orderly manner. Attitudes which cause individuals to always behave in the same way to people, objects, events and foundations are constant and unchangeable beliefs, feelings and tendencies. Hafize (2017) notes that while the positive attitudes serve a better comprehension of the nature of learning for the learners, it also makes the students more open to learning, increases their expectations from

learning process and reduces their anxiety levels. For instance, students having positive attitudes towards reading take more advantage of the advance organisers (Yalman & Tunga, 2014).

However, it is important that the intrinsic motivators of the learner, such as the learners' sense of wonder, high expectations, desire of sufficiency, support this process. It is necessary to be eager and in need of learning in this process. It is important to know the ways of learning, develop expectations and have no anxiety for learning in order to be successful. Such a process will be followed by learning. Learning to learn is being able to produce new knowledge for the new situations by setting forth the available knowledge (Sarma & Puri, 2014).

The effort of students made in learning is the most important way for them to reach knowledge. Because there is desire, openness, expectation, curiosity towards knowledge and meeting of needs in the nature of learners. Learning means changing. Learners obtain information by structuring it in the mind, not in an unrefined way. Therefore, in the process of structuring information, being positive or negative of the way of accepting information, being open to learning or not, having high or low expectation levels and developed anxiety levels are all important factors. Extreme anxiety of the learners reduces their motivation levels, creates decrease in performance and thus it affects the self-confidence of individuals in a negative way, learning needs and expectations of the learners can change. In this sense, the learners need to know what is necessary to learn and how they will make this process easier. In this context, it is one of the important roles of teachers to support the learners for developing positive attitudes towards learning (Syyeda, 2016). The role of teacher is not only conveying knowledge but also simplifying the knowledge acquisition by building up learning desire for the students. Students need to be reinforced about learning to learn at

university. Bringing in lifelong learning desire and skills must create the priority of supporting their being open to learning. Learning aims not to remember knowledge, but rather it aims to find out the knowledge, make effort for learning and most importantly be able to use the knowledge wisely. As the learner is the first responsible one to create understanding and knowledge, it is significant to know what kind of attitude she/he has towards learning (Sarma & Puri, 2014)

Attitudes towards learning are important factors on the learners' levels of goal setting, problem solving abilities, their beliefs towards learning, their inner and external motivations in the process of learning and all the academic performances they perform. In this study, it is aimed to analyze the attitudes of university students in terms of different variables by using screening model. The attitudes of university students towards learning are evaluated from the points of four sub-dimensions the nature of learning, anxiety, expectation, and openness, their genders and academic achievements (Coccia, 2019). It has been seen that prospective engineers and technical teachers have positive attitudes towards learning.

Information Technology (IT) refers to the hardware and software used in computerized information systems and at present has been a major force in shaping the society (Bawaneh *et al.*, 2018; Safdar *et al*., 2016). It is clear that the revolution of information technology during the last three decades has changed the face of the world and had led to the development in all fields (Bilal *et al.*, 2016). Technology is pervasive, and it is invading every corner of the earth, albeit some areas more slowly than others (Kompf, 2015). Nothing is static in this world, everything changes almost after every second of the day, so should be teaching and learning. Gone are the days when teaching and learning is only based on chalk and books packed somewhere called library.

Today everything has gone computerized to retrieve, store and transmit information. Countries of the world such as UK, Austria, Finland, Sweden and Denmark, teachers and students have a generally positive attitude towards e-learning and relatively advanced competences (Mikre, 2011). Importance of IT in our society is enormous as it is not restricted by boundary, language and culture. However, Jammu and Kashmir State is of an underdeveloped in the field of technology use and it might be due to the risks and high costs. It is important to note that absence of scientific knowledge in any educational system makes such educational system as old as centuries behind the present age. There is a need for educators to understand students' attitudes toward the use of different types of technology as well as how these attitudes are related to their learning styles. Furthermore, students' performance is one of the key contributing factors determining the student's success in various subjects and areas (Shukakidze, 2013).

Generous investments were supported by the strongly held premise that technology can help students learn more efficiently and effectively, and as a result increase student academic performance (Abdullah & Mustafa, 2019). In fact, technology becoming a more prevalent part of the education culture with each passing year, the integration of technology into education systems is forcing colleges and universities to make dramatic changes, by increasing the quality, diversity and availability of information, and altering the teacher-student relationship (Inoue, 2018). It is reported that technology impacts students' daily lives and certainly plays an important part in developing students' positive and negative attitudes (Khalid *et al*, 2015).

The lack of Information technology facilities has led most of the students to become unfamiliar with using them and to have low behavioral attitudes towards using computers. Hence, there is a need to look at students' attitudes toward information technology and science education whether negatively or positively. Attitude in this study refers to three

components, such as affection, behavior, and cognition. Affection refers to feelings of an individual associated with an attitude object, cognition refers to individual beliefs or attributes associated with an attitude object, and behavior refers to past behavior or behavioral intentions relevant to an attitude object (Huskinson & Geoffrey, 2018). Noor *et al.* (2020) reported that students use all the applications in the same way and there is more use of social networking programs such as Google translator, YouTube, Facebook, MSN, e-mail and mobile, but no significant correlation between the level of use of application software and students' academic performance were found. Many studies have been conducted indicating the students' attitudes towards IT and the influences on academic performance and the results obtained were mixed. There is no doubt that IT tools facilitate communication among students, between students and instructors, even beyond the classroom experience to distant students and instructors.

2.1.4 Meaning and scope of basic science and technology at upper basic education level

Science and technology simply, is the harnessing and exploitation of our understanding of nature for our own benefit. Emphasis is therefore placed on it to give the students the right foundation for higher endeavor in science and technology. Nations that are considered to be developed and largely considered as civilized have achieved that status through purposeful scientific education of their citizens (Ajayi, 2017). In cognizance with the importance of science and technology, Basic Science and Technology are taught in Upper Basic schools in Nigeria to prepare a base for any science and technological development. Nigeria is looking forward to be among the most scientific and technologically advanced nations of the world.

The reason is not far-fetched from numerous contributions of science and technology to human development (Ekundayo, 2012). For any nation, especially Nigeria, to achieve

scientific and technologically advancement, it becomes imperative to start planning for a firm basic scientific education foundation for her citizens from childhood. This is because children begin career exploration at a very young age. To move with this pace, Basic Science is taught at the primary school so as to catch the pupils' heart young. As a follow up, Basic Science and Technology is taught at the upper basic level to enable students to build up and concretize the knowledge of science they had at the primary school level and to lay the foundation for the study of the core science subjects such as Biology, Chemistry and Physics at the senior secondary level of education. In Nigeria, Basic Science and Technology is an important subject that is taught at the Upper Basic Education level while core science subjects such as Biology, Chemistry and Physics are taught at the Senior Secondary level.

Basic Science and Technology is one among science subjects which expresses the fundamental unity of scientific thought (Silver, 2021). It is expected that by teaching Basic Science and Technology to children at basic education level, every Nigerian student would be given the basic knowledge and understanding of what science is all about and some of the innovations that are taking place around them. This assertion blends with the objectives of science teaching at the Upper Basic Education which is to produce individuals who will be able to live effectively in the modern age of science and technology and contribute to the development of the nation.

Basic Science and Technology provides students at the upper basic education level with the initial theoretical and practical frameworks which are inevitable prerequisites for their future study. This statement buttressed by Ekundayo (2018) maintains that Basic Science and Technology enables students to understand science concepts, principles, theories and laws which are further elaborated in the core sciences such as Biology, Chemistry and Physics. It is regrettable that there is a public outcry due to poor quality science education,

specifically in science subjects such as Biology, Chemistry and Physics. In this study, quality is defined as “fitness for purpose”. Quality is considered as “fitness for purpose”. Quality is considered as baseline standard in education. Quality therefore is an expression of standard or it is the means by which a certain set standard in education can be achieved. Quality science education is defined as the acquisition of measurable knowledge, skills, and attitudes among learners.

Although previous studies by Tytler (2012) and Scheerens (2013) agrees that science education quality can be determined by policy and contextual factors within the environment, the availability of inputs, the processes and the consumers of the products of science education. The present researchers also observe that, quality science education can also be determined by the students’ achievement in standardized examinations and since many teachers believe that the achievement of their students is an index of the quality of education acquired by the students. Poor quality science education is one the problems facing science and technology advancement in Nigeria in recent time. A good quality science education is one that provides all learners with capabilities they require to become economically productive, and develop sustainable livelihood, contributes to peaceful and democratic societies and to enhance individual well-being.

It is an application of knowledge for practical purpose. It is used to improve human condition, natural environment or to carry out other socio-economic activities. It could also be defined or refers to all processes dealing with materials and their end products Al-harby (2012). One important attribute of technology is that it does not just happen; it is developed and learned whether in the farm of manual skills or as an applied science. It is the systematic application of collective human rationality to the solution of human problems through the assertion of control over nature; technology is the engine of growth.

Technology can be traced historically to the beginning of time to be man's quest to improve his way and quality of life. According to Anaeto *et al* (2016), Technology is the total and complete application of man's knowledge, skills, tools and materials. It is the use of scientific knowledge to develop and produce goods and services useful to man. It is practical problem-solving enterprise, which is propelled by scientific discovery or by societal needs. Educational technology is a wide field. Therefore, one can find many definitions, some of which are conflicting. Educational technology can be considered either as a design science or as a collection of different research interests addressing fundamental issues of learning, teaching and social organization.

The Association for Educational Communications and Technology, the professional society for ET, defines it as: Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using, and managing appropriate technological processes and resources. As a field, educational technology emphasizes communication skills and approaches to teaching and learning through the judicious use and integration of diverse media. Scholars in the field examine the uses of innovative media and technologies for education, examining all aspects from direct student learning to management and impacts on institutions. As in all forms of applied technology, the field studies how theoretical knowledge and scientific principles can be applied to problems that arise in a social context (Coccia, 2019). Practitioners in educational technology seek new and effective ways of organizing the teaching and learning process through the best possible application of technological developments. These activities rely upon a body of knowledge for successful and ethical implementation, rather than routine tasks or isolated technical skills (Sambo, 2015).

Science and technology are widely recognized as an important tool for fostering and strengthening the economic and social development of the country. India has made significant progress in various spheres of science and technology over the years and can now take pride in having a strong network of institutions, trained manpower and an innovative knowledge base. Given the rapid pace of globalisation, fast-depleting material resources, increasing competition among nations and the growing need to protect intellectual property, the importance of strengthening the knowledge base is an important issue that needs to be recognised. Recognising the global economic order, the focus of the in the science and technology sector would be to: strengthen application-oriented research and development for technology generation; promote human resource development, especially in terms of encouraging bright students to take up science as a career; encourage research in and application of science and technology for forecasting, prevention and mitigation of natural hazards; integrate the developments in science and technology with all spheres of national activities; and harness it for improving livelihood, employment generation; environment protection and ecological security (FGN, 2018).

2.1.5 Basic science and technology education in Nigeria

The Nigerian educational system took its root from the traditional system of the pre-colonial era. This was a period of indigenous education in which traditional education activities were practiced in various vocations like farming, weaving, blacksmithing, pot making, traditional medicine, hunting, etc. Learning at that time was characterized by apprenticeship and much of unrealized and unexplained science and technology were practiced. There was no formal curriculum but the training was relevant to the needs of the society. Some authors described the training as somehow primitive and localized because it was informal (Ekundayo, 2012).

Science embraces every attempt of humans to explore, interpret and manage the natural world. It is dynamic and essentially concerned with the search and explanation of both regularities and irregularities in nature. It involves the quest for actions and reactions, causes and effects in the environment. The purpose of science is to transform the environment towards improving the general quality of life, thus making the world a better. The science that is formal involve a systematic study of natural phenomena and its study allows students to experience the richness and the excitement of the natural world as they engage in inquiry, critical thinking and the demonstration of skills. The scientific enterprise is one that is challenging and innovative. It blends with technology which focuses on inventions and problem solving. Consequently, the harmonious interplay of science, technology and society is the springboard for sustainable development. It equally facilitates and enhances industrial and technological progress among the people and within a nation.

2.1.6 Importance of basic science and technology in education

The internet can distract them from the learning process, but you can also use their inclination to spend time online for a good purpose: Making learning enjoyable. You can also rely on technology when you want your students to take part in discussions. Set up a private Facebook group for your class and inspire constructive conversations. A need of developing 21st century's manpower skills requires students to gain experience through activities, experiments, and research. Therefore, science classrooms should provide students learning environments that contribute to their development of life skills. Science teachers should provide opportunities for their students to make them adapt to others' works and ideas, solve problems, cope with works assigned, think through technical terms, and share their results (Bybee, 2016). All these can be achieved through development of contemporary curricula. Therefore, many countries have begun to consider more contemporary teaching-learning approaches such as constructivism, multiple-intelligence

theory, etc., and have changed their education systems which Nigeria is considered to be among.

2.1.6.1 Technology makes distance learning more accessible

The wonders of the internet, that made people to get access to any type of information at the very moment they think of it. Today, distance learning is one of the most trending learning methods Bilal *et al*. (2016). Virtual lessons are slowly taking the place of traditional lectures. Students can organize their time in a way that works for them, and they can easily gain the knowledge they are interested in. For example, let's say one of your students shows great interest in Astronomy, but the traditional curriculum does nothing to feed that hunger for knowledge or any other online service that offers high-quality virtual lectures.

2.1.6.2 Students and teachers can access information at any time

This is possibly the most obvious benefit of technology. When old-school teachers were students, they had to spend hours in the library looking for the information they needed. Today, technology integration makes everything different and simpler Safdar *et al*. (2016). Students can easily access newspapers, scientific articles, studies, and any other type of content online. They can write better, deeper academic papers because they can support their arguments with more evidence.

2.1.6.3 Technology makes collaboration more effective

Think about the way collaboration looks like in a traditional classroom setting. You organize groups, assign the projects, and suddenly the class becomes a complete mess. Some students express their opinions too loudly and firmly, while others don't get an opportunity to be heard. Online tools and apps offer a unique setting for students to engage in a group project (Al-harby, 2012). They can do the work from home; the team is connected through the Internet and everyone is inspired by the focused environment. The

relations between science and technology are complex and vary considerably with the particular field of technology being discussed. For mechanical technology, for example, the contribution of science to technology is relatively weak, and it is often possible to make rather important inventions without a deep knowledge of the underlying science. Abd-El-Aziz *et al*. (2020), by contrast, electrical, chemical, and nuclear technology is deeply dependent on science, and most inventions are made only by people with considerable training in science. In the following discussion, we outline the variety of ways in which science can contribute to technological development.

A more common example of a direct genetic relationship between science and technology occurs when the exploration of a new field of science is deliberately undertaken with a general anticipation that it has a high likelihood of leading to useful applications, though there is no specific end-product in mind (Safdar *et al.,* 2016). The teaching of engineering suffers from deficiencies arising from underdevelopment itself. There is an emerging technology development and misunderstanding towards scientific research, due to the absence of a tradition of a true culture of engineering.

Education should promote the training of engineers not only to know how to use operations manuals more efficiently. Indeed, the aim is to clarify, within the limitations, which are the most important factors that influence the educational problem. The teaching of engineering suffers from deficiencies arising from underdevelopment itself. There is an emerging technology development and misunderstanding towards scientific research, due to the absence of a tradition of a true culture of engineering. Education should promote the training of engineers not only to know how to use operations manuals more efficiently (Bilal *et al.,* 2016). Indeed, the aim is to clarify, within the limitations, which are the most important factors that influence the educational problem. Since science and technology are part of the national strategy for development, its literacy is essential. Part of what is needed

to enhance that process is public pressure to encourage more Nigerians to study science and technology. Science and technology education have suffered enormous setback in Nigeria due to the low status accorded to it in general. Some of the problems emanate from the various interpretations of science and technology education by policy makers as well as by the implementers of policies on science and technology education. New policies are needed to clarify the importance, role of science and technology education, and to address the requirements in various sectors of society (FGN, 2018).

2.1.7 Importance of basic science and technology in nation building

Development at any phase is always linked with technology and technology happens when there is advancement in science. Hence science, technology and development are all proportional to each other, as such Basic Science and Technology is of immense importance in every child in Nigerian context (FGN, 2018). Development is required in every individual to every nation in all aspects and for development to happen, science and technology go hand in hand. Basically, science is known as the study of knowledge, which is made into a system and depends on analyzing and understanding facts. Technology is basically the application of this scientific knowledge. For any successful economy, particularly in today's quest for knowledge-based economies, science, technology and engineering are the basic requisites.

Science and Technology is associated in all means with modernity and it is an essential tool for rapid development. Modernization in every aspect of life is the greatest example of the implementation of science and technology in every nation. With the introduction of modern gadgets in every walk of life, life has become simple and this is possible only because of implementing science and technology together. Without having modern equipment's in all sectors, be it in medicines, infrastructure, aviation, electricity,

information technology or any other field, the advancement and benefits that we face today would not have been possible (Elom & Okoli, 2014). A nation who is not able to prosper on these grounds would never be able to sustain the lives there and may have to solely depend on other nations for the basic requirements.

2.1.8 Basic science and technology in upper basic education curriculum

The content of the Basic science and Technology curriculum, for the 9-year basic education programme in Nigeria, compares in every respect with other science and technology curricula at that level in other parts of the world, and all of them are geared towards scientific literacy for all in line with the goal of science education across the globe in the 21st century (Okorie, 2016). The implication is that what is taught to Nigerian children must be current, and should meet globally acceptable standard. The teacher in the Nigerian educational system must therefore be current, knowledgeable academically competent and able to effectively deliver instructions on the concepts and contents of the curriculum.

Curriculum is a dynamic programme that is expected to address the changing needs and aspirations of any society (Igwebuike, 2018). Nigerian policy-makers and educators recognize the role of science and technology in the achievement of education for all and national development in the present millennium. This has informed an evaluation process that led to the development of the nine-year basic science and technology curriculum of the universal basic education. The curriculum was implemented in September 2008 in primary one in Nigeria. This study is an investigation into the level of implementation of the basic science and technology curriculum.

In Nigeria, education is perceived as an instrument for achievement of national objectives. According to the National Policy in Education (FRN, 2014), education is an “instrument per excellence” for achievement of national development. This explains the huge amount

of money government earmarks for education in its annual budget. The basic education curriculum is an innovation in Nigerian education system. It was developed by the Nigerian Educational Research and Development Council (NERDC) following a directive it received from the National Council on Education (NCE) in 2005 to restructure and re-align the existing primary and junior secondary school curricula to meet the targets of the nine-year basic education. The features of the nine-year basic education curriculum are as follows: Firstly, it stipulates nine-year continuous basic education structured as lower Basic Education Curriculum (Primary one to three), Middle Basic Education Curriculum (Primary four to six) and Upper Basic Education Curriculum ; Secondly, the overall objectives of the curriculum are to develop interest in science and technology, acquire basic knowledge and skills in science and technology, apply their scientific and technological knowledge and skills to meet societal needs, take advantage of the numerous career opportunities offered by science and technology and become prepared for further studies in science and technology (NERDC, 2015). In addition to these, the curriculum emphasizes the following process skills: enquiry, intellectual, manipulative and societal values. The basic science and technology curriculum for primary school level shares these features.

Aylin (2016) and Faure (2015) explained life-long education as that which is concerned with helping learners to develop skills, competencies and attitudes which enable him/her to live successfully in the society as well as prepare him/her to assume roles as an adult in future (Igwebuike, 2018). Experts agreed that the teacher is a critical factor in the successful implementation of any educational innovation (Charles, 2012; Nwadiani, 2017). They argued that previous policies failed partly because teachers did not possess adequate knowledge about them. This argument was supported by the declaration in the National Policy on Education that no education system can grow above the quality of its teachers

(FRN, 2014). Nwadiani (2017) stated that among the problems in reform implementation in Nigeria is lack of understanding of the policy.

According to Ereh (2016), curriculum implementation consists of two components: the technical and the managerial. The technical component consists of actual development of the curriculum or programme. The managerial component consists of planning for its development. The teacher is central in the task of implementation of any curriculum. His understanding of the curriculum objectives, contents, materials and methods is crucial in his/her ability to implement the curriculum. The nine-year basic education curriculum which embraced basic science and technology curriculum was implemented in primary one and the basic science component in junior secondary school one respectively in September 2008.

2.1.9 Upper basic education in Nigeria

Basic education is the core of a sound educational foundation. It is the major step towards building a sound mental system for the young learners within the age range of 6 years to 14 years. Basic education is the foundation upon which other levels of education are built and a necessary requirement for human and national progress. It is fundamental to human and national development (Sambo, 2015).

Basic education brings growth and development to the young one's intellectual capacity as well as their morals, attitudes and how they relate to those around them. Every child is entitled to have a qualitative and sound education for a more promising prospect. The basic education initiative was designed to ensure that adequate and qualitative education is directed towards achieving the nation's objectives (Sambo, 2018a).

A country's development lies solely in its educational system. The high standard of quality education in the nation will give rise to improved changes in the nation's administration.

2.1.10 Importance of upper basic education in Nigeria are listed below

i. Reduction in Illiteracy

Basic education helps to drastically reduce the rate of illiteracy in the society by equipping the young learners with the knowledge, skills and values needed to cope with the everyday societal issues. Learning how to read, write and perform simple arithmetic calculations which is part of the day-to-day activities of everyday life will not only improve the country's development but also that of the recipient of the basic education in the long run. Children in Nigeria could hugely benefit from using computer accessories for online classes since it will give them equal opportunities to participate in the educational process.

ii. Effective Communication Skills

Basic education helps to inculcate in the young learners how to interact and relate with people around them and the school is a better platform where children from different backgrounds come together under one umbrella to receive basic teachings that would impact on them positively.

The ability of young learners to communicate effectively can enable them represent their school and the country in an international setup which is relevant to the social and economic development of the nation. It also helps to build eloquent individuals for a more literate society.

iii. Rights of the Child

Basic education helps to enlighten young learners on their rights. It helps eradicate the gender inequality issue which gives the male gender advantage over the female.

Basic education ensures that every child irrespective of their sex, age, ethnic or religious inclinations, language or status have a free, universal and compulsory basic education which would see to a more civilized nation.

iv. Improved Learning Skills

Basic education helps to improve the learning skills of young learners on key subjects that would be of great importance to them in the future.

Subjects that would be further studied in the secondary and tertiary institutions that would propel them towards their career path

v. Reduction of Poverty

Illiteracy leads to high rate of poverty in the society. Basic education helps to reduce the rate of poverty by creating awareness of its benefits in the society.

With the millennium development goals which main purpose is to see that poverty is completely eradicated.

vi. It Creates Jobs

For a qualitative educational system, the services of a qualified teacher is needed and basic education helps to create jobs for teachers to help train and nurture these young minds so that they can have a solid educational foundation.

vii. Public health

Basic education helps to improve the health of the citizens through immunization, vaccinations and other form of medical practices that would reduce the spread of contagious diseases.

viii. Impact on Democracy

Basic education helps to impact on democracy, human rights, governance and political stability through increased understanding of non-violent ways to solve problems and mutual understanding between groups in conflict.

ix. Basic education helps to develop sound standard of individual conduct and behavior

thereby creating a good and upright citizen who obey the laws of the country and avoid criminal activities that would impede on the country's progress.

x. Basic education ensures economic growth through increased creativity and productivity of individuals that would positively contribute to the economic growth of the. nation.

Basic education is important as it is a panacea for solving problems such as illiteracy, ignorance, religious violence, insecurity and political servitude and it is the fuel to a better society. All the above listed importance were adapted from the National Policy for science and technology education in Nigeria (FGN, 2018).

2.1.11 Gender and school attendance

Judith and Paul (2021) opined that there are established gender gaps in education. Females tend to have higher educational attainment and achievement than males and this is particularly the case for children from less advantaged backgrounds. There are large differences in the fields of specialization chosen by males and females in college and even prior to college and females disproportionately enter less highly paid fields. Gender differences in non-cognitive traits, behavior, and interests have been shown to relate to differences in educational outcomes; however, this evidence cannot generally be given a causal interpretation. In contrast, the literature has been creative in estimating causal impacts of a wide range of factors using experimental and quasi-experimental variation. While the approaches are compelling, the findings vary widely across studies and are often contradictory. This may partly reflect methodological differences across studies but also may result from substantial true heterogeneity across educational systems and time periods.

A large body of research has identified gender differences in educational achievement and there are two broadly accepted findings from this literature. First, females tend to have

higher educational attainment and achievement than males and this is particularly the case for children from less advantaged backgrounds. Second, there are large differences in the fields of specialization chosen by males and females in college and even before. These tend to imply that females disproportionately enter less highly paid fields.

We briefly conclude with a few general points on research on gender gaps in education. First, while the stylized facts are quite well established, there is still much work to be done to better understand the reasons for these gaps. Second, there is a very impressive set of studies that have estimated causal factors influencing gender gaps in education. However, there is a lack of consistent findings. Finally, many papers that estimate interesting causal effects do not report separate results by gender, leaving us unsure about the effect of the treatment studied on gender gaps.

In the present study this particular gap on gender is vividly consider in all ramification, and it shows no difference between the gender which contradict the affirmation study.

2.1.12 Location and academic performance

Academic performance is a composite term that refers to both pupils' ability and performance. It is inextricably linked to human growth and cognitive, emotional, and social physical development; it represents the whole child; it is not confined to a single event, but happens across time and levels throughout a students' school and working life (Faure, 2015). Abubakar and Adegboyega (2012) found a favorable association between location and academic performance across secondary schools. However, location was found to be insignificant in term of students' academic performance, but location was found to be the greater predictor of academic performance. In light of the foregoing, John *et al.* (2015) lamented that a students' chronological location had a significant impact on his or her academic performance, such that the youngest student had the potential to outperform the oldest on a teacher created test.

2.2 Theoretical Framework

2.2.1 Dewey's theory of interest

Dewey believed that learning was active; he felt that children should come to school to practice with others in a community that gave them the experiences to share with a society. For instance, students should be involved in real-life and make a connection between what they experienced and what they learned in school. Moreover, Dewey focused on learning by doing by explaining that schools typically do the same activities that they are doing at home. Also, the level of the growth gradually improves because their social life and the school life are connected together (Dewey, 1896). This method works particularly well in educational activities because the students are interested in discovering things for themselves. Vygotsky's theoretical idea is that social interaction is the essential part in the development of cognition. In 1978, Vygotsky said that "every function in the child's cultural development appears twice: first, on the social level, and later, on the individual level; first, between people and then inside the child. This applies equally to voluntary attention, to logical memory, and to the formation of concepts. All the higher functions originate as actual relationships between individuals".

Dewey regards interest as the psychical state that obtains when individuals consider their self-expression dependent upon the interaction between themselves and a particular objector idea. As Dewey states in 'Interest in Relation to the Training of the Will': 'Genuine interest in education is the accompaniment of the identification, through action, of the self with some object or idea, because of the necessity of that object or idea for the maintenance of self-expression. In other words, Dewey believes that students become interested in a particular object (a fact, or concept, or expression, among others) when they regard that object as so important that if they cannot apprehend it, absorb it, so to speak, through physical or psychical interaction, they will not be able to be the individuals they

desire to be. The individual longs to connect his or her incomplete being with the being of the object or idea, because the connection fulfills the missing portion of his or her own being.

Dewey's position is further illuminated by looking at what he considers the etymology of the word 'interest'. 'Inter-esse' means literally 'to be between'. Dewey claims. 'Interest marks the annihilation of the distance between the subject and object; it is the instrument which effects their organic union' (Dewey, 1896). Interest acts as the psychical connector between the object and the individual; it is like a psychical bridge which connects the consciousness with some otherwise ostensibly independent object. Where interest is lacking, the subject and object may interact, but there is no attending psychical manifestation that aims to integrate the subject and object; interest is absent and therefore the consciousness does not identify itself with the object even though it is interacting with it. But now the question arises: how is this so-called 'interest' different from mere pleasure or sugarcoating. If a child feels a strong desire to see bright colors, and because of this desire is drawn to a book with bright colors, is the child not interested in the book?

Dewey argues in the negative. Dewey admits that an individual can be attracted to an object because it embodies some locally pleasurable aspect, but claims it only becomes interesting when there is an attending identification with the object. The key to his understanding lies in his distinction between the types of pleasure inherent in interest and mere pleasure.

The relevance of this theory to the present study is that since the present study is looking at students' situational interest and attitude towards learning basic science and technology at upper basic education level in Minna Niger state. When students observe the collective interest of teachers on science and technology at lower basic schools, by the way, teachers lay enphasis. They will also develop high interest on the subject matters. Parents or caregivers should be encouraged to show and exhibit interest on science and technology at

home to their children. A student who has interest in any aspect of learning will tends to perform better than others.

2.3 Review of Empirical Studies

Studies have been carried out to investigate the impact of Situational Interest in lower basic educational level. These studies have focused on various factors that have been influenced by Situational Interest. Still, very few studies evaluate the Situational Interest and Students' Attitudes to basic Science and technology at upper Basic Education. Similarly, these studies also give mixed findings about the impact of students' Attitude on Science and Technology in secondary schools. This study, will specifically review literature that is connected to the variables to the study which are Situational interest, Attitude, and Basic Science and Technology.

2.3.1 Empirical review on situational interest

Zhu (2019) investigated a study to examined the contribution of situational interest motivation and cognitive engagement in workbooks to student achievement in learning health-related fitness knowledge. A total population of 12,762 students from Urban Elementary Schools in Guanghou, with a 670 third-grade students from 13 randomly selected urban elementary schools participated in the study. Structural equation modeling and regression curve estimation analyses revealed that situational interest contributed little to workbook performance and knowledge gain.

Performance on solving workbook problems contributed significantly to knowledge gain. The results also show that skipping workbook tasks had stronger negative impact on knowledge gain than performing the tasks incorrectly, suggesting the importance of engaging students in the learning process by attempting the workbook tasks. The findings reinforced the value of using workbooks to facilitate cognitive knowledge learning in

physical education, but raised questions about the direct function of situational interest on engaging students in cognitive learning.

The present study is mainly concern with situational interest and it dimension towards learning basic science and technology and the target population is the upper basic education level.

Linnenbrink-Garcia *et al.* (2010) investigated a title, Measuring Situational Interest in Academic Domains among undergraduates in Duke University, Durham, NC, USA. The population of the study comprises of 1838 Psychology undergraduate students. Three studies were conducted to develop and validate scores on a new measure appropriate for assessing adolescents' situational interest (SI) across various academic settings. With a sample size of 858, Random sampling technique was used to divide the population into two halves yielding a group of 429 participants for each factor analysis (exploratory and confirmatory). Analyses revealed no reliable differences between the groups on gender, year in college, class, or course grades. A multivariate analysis of variance (MANOVA) revealed no statistically significant multivariate difference between the groups on the item scores. Moreover, situational interest was shown to be distinct from individual interest and was a statistically significant predictor of change in individual interest across the school year.

This study also has similar in terms of gender variation but where difference come to play is analysis, (Mann-Whitney and Kruskal's walis U-test). Jerome (2016) made a research on Interest Development: Arousing Situational Interest Affects the Growth Trajectory of Individual Interest in Nanyang Technological University Singapore. The population of the respondents was 316 and the first study was 187 respondents were randomly selected as the sample size, 187 tested the assumption that repeated arousal of situational interest affects the growth of individual interest. Latent growth curve modeling was applied and

the results suggest that the arousal of situational interest has a positive effect on the development of individual interest and significantly influences its growth trajectory. The second study tested the assumption that engaging students with interest-provoking didactic stimuli, such as problems, is critical to triggering situational interest and increasing individual interest. To test this assumption, four classes of primary school students (N = 129) were randomly assigned to two conditions in a quasi-experimental setup. The treatment condition received four situational-interest-inducing science problems as part of a course whereas the control condition did not, all other things being equal. The results of latent growth curve modeling revealed that only the group receiving problems experienced repeated arousal of situational interest and its related growth in individual interest. Implications for, and amendments to, the four-phase model of interest development are proposed. There exists difference between the current study and this study, the current study is adopting a 5 likert scale for instrument whereas this study adopted a 4 likert scale.

Jerry and Robert (2011) investigated a study on Situational Interest, Computer Self-Efficacy and Self-Regulation: Their Impact on Student Engagement in Distance Education in Large Research University South-West United State of America. The population of the students comprises of 203 students enrolled in an online class in the semester of 2011 in the school Gerontology and Engineering. A random sampling technique was used to divided the population base on gender with 67 females and 135 males. Situational interest and self-regulation were found to be significantly correlated with three types of engagement (behavioural, emotional and cognitive), while computer self-efficacy did not appear to be associated with any of those engagement variables. Results suggested that online activities and tools such as multimedia and discussion boards may increase emotional engagement in online learning, although they do not necessarily increase behavioural or cognitive engagement, that educators should identify students who are

taking online courses for the first time and provide necessary technical help to increase their emotional engagement, and that it is important for educators to offer students strategies for increasing their self-regulation in distance education environments.

Amanda *et al.* (2015) investigated whether Success Expectancies Moderate the Effects of Utility Value Information on Situational Interest and Performance in Midwestern University Oklahoma. A total population of 418 College students from Midwestern University learned a new technique for mentally solving multiplication problems with instructions containing task utility information or not. In the Study, the sample size was 210 and a random sample technique was used for N = 210, the effect of the utility value information was positive for individuals with high success expectancies, but negative for individuals with low success expectancies. The results showed further support for the importance of success expectancies in moderating the effect of directly-communicated utility value. The results are discussed in relation to other research on utility value, interest, and expectancy– value models of achievement behavior.

2.3.2 Empirical review on attitude

Asifa (2018) investigated the Attitude of Students towards Information Technology and Science Education. The present study, conducted in Kashmir valley of J&K State, quantitative approach with survey design was used. The survey included 400 students selected at random from different educational institutions of the Kashmir valley. To examine attitude of students towards Information Technology and science education, a well-designed questionnaire was used for the collection of data and the data collected was analyzed using SPSS software. The results of the study, revealed that number of internet users increase continuously. Statistically, non-significant difference was observed between male and female respondents towards the use of e-resources for learning and entertainment

purpose. The study further, revealed that students, both males and females, were of the opinion that knowledge of IT is very important for science education. Finally, problems faced by students related to use of e-resources were discussed.

Mohammed *et al*. (2020) carried out a study to Assess Attitudes Towards Science and Technology Middle School Students in Kwara state, Nigeria. The population included all 3rd grade students. A total of 230 students (105 females and 125 male) chosen through stratified random sampling method was used for the study. Research instrument was the Persian translation of the Science Education questionnaire. Results indicated that there is a positive attitude towards science and technology among students. However, there was not a positive attitude towards some items of science and technology. The results also showed that there is a meaningful difference between males and females points of views in attitude towards sciences and technology. According to this result, males have higher averages than the females. The results of this research provide important information about students' attitude towards science and could be used by science teachers and educators to development of science curricula and science books.

This study shows no difference in the mean gain for both situational interest and attitude in the analysis result.

Chang *et al.* (2014) in their study on Taiwanese Students Examined their Attitudes about Science and Technology, Learning Interests and Life Experiences in Taiwan. With 942 Taiwanese students and 300 students were randomly selected for the study. The results indicated that boys showed higher learning interests in sustainability issues and scientific topics than girls. However, girls recalled more life experiences about science and technology in life than boys.

Sethi (2015) investigated Attitude of the Students Towards Science in Relation to Certain Non-School Factors, in Malaysia, the purpose of the present study is to study of attitude of the students towards science in relation to certain non-school factors. With a population of 645 students. The sample consisted of 100 students. In order to visualize the nature of score distribution of the data collected, numerical determinations of normality like mean and standard Deviation were worked out t-test was used to test the significance of difference between means in relation to gender, locality and socio-economic status of students. The main findings of the study were that significant difference exists between urban and rural students but no significant difference was found on the basis of gender and socio-economic status.

Otundo and Garn (2016) carried out a study with high school students (N = 477) enrolled in physical education classes in Kenya. Data were analyzed using simple correlation, independent t-test, confirmatory factor analysis, and structural equation modeling. Results: Regression results show that the five indicators predicted about 73% of the variance in situational interest. Confirmatory factor analysis support four indicators (optimal challenge, attention demand, exploration intention and enjoyment) of situational interest. There is no relationship between students' interest and gender. Situational interest is influenced with both teacher and peer support. Personal interest is associated with situational interest. Students' physical activity motivation is associated with situational interest. Findings partially support previous studies that point to five indicators of situational interest. Establishing learning environment that uphold teacher and peer support might help trigger and maintain situational interest. Students' past experiences could influence situational interest. The current study did not use confirmatory analysis in the dimension instead mean and standard deviation and mann-whitney.

2.3.3 Empirical review on upper basic education

Abd-El- Aziz *et al.* (2020), carried out a research on the topic Identification of Basic Technology difficult topics as perceived by upper basic education teachers and students in Ibadan metropolis. The sample size for the study consists of 222 teachers and 397 students selected across all schools in the eleven local governments. The sample size for the two categories of respondents was determined using Singh and Masuku's model on a 2.5% marginal error to arrive at the figure of 397 out of 42,331 students and 222 from 523 teachers. Multi-stage sampling technique was used for the study, the findings reveals that 50 percent of the students perceived that the basic science and technology curriculum topics are difficult and 62.5 percent of the teachers perceived to be difficult to and also to teach. This present study lays emphasis on students' situational interest and attitude towards basic science and technology while earlier research enphasises on the perceived difficulties which interest and attitude seeks to fulfil.

Campbel (2015) investigate Pupils' Perceptions of Science Education at Primary and Secondary School Using interviews and questionnaires, data was collected from pupils during their final term in primary school and their first term in secondary school. This was used to determine the extent to which their expectations of science education are met as they progress from Key Stage 2 to Key Stage 3 of the English National Curriculum. At primary school, pupils were enthusiastic about science because of its distinctiveness and the exciting uncertainty of experimentation. Expectations of science in secondary school were of using specialist facilities and apparatus, of experimentation and of similar but more challenging content. After moving to secondary school, pupils reflected less positively on their primary school experience. Expectations of a greater academic demand of secondary school science were not met. Similarly, their expectations of continuing to learn science through a predominately practical approach were not fulfilled.

Opara and David (2014) investigate the Factors Affecting Teaching and Learning of Basic Science and Technology in Secondary Schools in Imo state. The purpose of this study was to investigate into the factors that affect teaching and learning of Basic Science and Technology in primary schools. The population of the study consisted of 100 male and female teachers in the primary schools. A survey research design was adopted for the study, three research questions and two null hypotheses were formulated base on the specific purpose of the study. The data for the study were collected by means of structured questionnaire developed the researcher. The data collected were analyzed using mean score to answer research questions, while the null hypotheses were tasted using t-test at 0.05 level of significance. The study revealed that most of the instructional materials were not available for teaching basic science in primary schools. The non-available of material implies their non-utilization. Primary school administrators should encourage classroom teachers to produce and use instructional materials in teaching. Teachers should not wait for the Government to do everything; they should go extra mile in the provision of instructional materials for their pupils.

Wajszczyk (2014) also investigates the Impact of Technology in Early Education in Punjab. The population of the study is 4203 and 500 pupils were randomly selected for the study. The results of this study are based on both a literature review and a qualitative study. The result of this study shows a number of different aspects and issues that introduction of ICT into early education has caused and how it influences both teachers and students. As a result of the interviews and the survey answers, the main factors that have to the highest degree influence on how ICT does affects pupils are the access to technology and the abilities of both students and teachers. Despite all negative effects that ICT may be

associated with, it can be concluded that the impact of ICT on students is positive in most cases.

John and Sele (2011) carried out a study to investigate Teachers' Involvement in Implementing the Basic Science and Technology Curriculum in Primary Schools in WSLGA (Warri South Local Government Area) of Delta State. The population of science teachers in the Local Government is 322. 194 science teachers were randomly selected for the study. Interview and questionnaire were used to collect data from headmasters and basic science and technology teachers. The results showed that teachers are not involved in the implementation of the curriculum. This is evident from the fact that primary science teachers do not have knowledge of the curriculum in terms of the objectives and activities. Secondly, the curriculum was not available in most of the schools. The similarity between this study and the current study is that they both considered Science and Technology subjects at Basic level. The difference that exist between the current work and this study is that the current work investigates more on students' situational interest and attitude.

Purposive sampling technique was used to select 402 permanent teachers out of the three categories of teachers in the schools that are, teachers employed by the parents and teachers' association, teachers who were on their National Youth Service Corps and permanent teachers employed by the state government. Proportional sampling technique was used to allocate the percentage of respondents who participated in the study from each local government.

Simple random sampling technique was used to select 250 out of 402 permanent teachers who are the real respondents. More so, proportional sampling technique was used to allocate the percentage of students who participated in the study for each local government.

Simple random sampling technique was used in the last stage to select 420 students who are the real respondents.

The findings from the study indicate that students perceived more than 50% of the topics in the upper basic education basic technology curriculum as difficult, out of which teachers perceived 62.5% of the topics identified as difficult to learn by the students as difficult to teach.

2.4 Summary of Related Literature Review

The study has reviewed related literature using journal articles, dissertations and conference proceedings; although there is an abundance of research on situational interest on Basic Science and Technology, the majority of it focuses on students' Attitude towards Science and Technology in Upper Basic Education level. The research that has been conducted on students' Situational interest and Attitude concentrates mainly on secondary school students' and undergraduates. Some studies have investigated the impact of students' attitude towards implementation of Science and Technology in Junior Secondary schools. Overall, these studies suggested that student's Attitude and situational interest on Basic Science and Technology is positive. However, more research in this area is necessary to more firmly establish this interest and generalize results to other populations. Very few studies have investigated the students' Situational interest, and Attitude on Basic Science and Technology at Upper Basic Education Level in Niger state. Although their results support a significant and positive interest and attitude of students on Basic Science and Technology at Upper Basic Educational Level, more research is necessary for this area.

With the best knowledge of the researcher, no research work has been carried out specifically in Niger state on the Situational Interest and Attitude of Students towards

learning Basic Science and Technology in Upper Basic Educational Level. Hence this present study wishes to fill this research gap.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 Research Design

Descriptive survey research design was used for this study. The descriptive design involves the use of quantitative approach to gathering data (Creswell, 2012). Research questions for this study were answered using data that were gathered from opinion of the students regarding their situational interest and attitudes towards learning of basic science and technology.

3.2 Population of the Study

The population of this study comprises all students at upper basic education level in Junior Secondary schools' (JSS) in Niger East Senatorial Zone which consist of nine local governments areas namely; Bosso, Chanchaga, Gurara, Munya, Paikoro, Rafi, Shiroro, Suleja, and Tafa Local Government Areas (LGAs). The total population is sixty-five thousand four hundred and twelve (65,412) students comprising of thirty-four thousand six hundred and twenty four (34,624) male students and thirty thousand seven hundred and eighty eight (30788) female students for 2021/2022 Academic session (Niger State Universal Basic Education Board, Minna, 2022).

The target population for this study, comprises all the Junior Secondary School III (J.S.S. 3) students in Niger East Senatorial Zone with a population of twenty-one thousand three hundred and fifty four (21,354) students comprising of ten thousand seven hundred and seventeen (10,717) male students and ten thousand six hundred and thirty seven (10,637) female students (Niger State Universal Basic Education Board, Minna, 2022). .

The population distribution table for the study is presented in Appendix F, Page 93.

3.3 Sample and Sampling Technique

The sample for this study is three hundred and eighty two (382) J.S.S. 3 students. Cluster sampling technique was used to select four LGAs from Niger East Senatorial Zone. The selected LGAs were Bosso, Chanchaga, Shiroro and Paikoro. Purposive sampling technique was then used to select two rural and urban co-educational schools from each of the selected LGAs. Proportionate stratified random sampling technique was used to select 22.5 % of students from the eight (8) selected schools. Hence, the sample size is 382 which corresponds with Krejcie and Morgan (1970) table as indicated on Appendix C, Page 83. The proportionate sample size from the eight schools is presented in Appendix H, Page 100.

3.4 Instruments for Data Collection

Two research instruments used for the study are structured questionnaire titled Basic Science and Technology Students Situational Interest Questionnaire (BSTSSIQ) and Basic Science and Technology Students' Attitude Questionnaire, (BSTSAQ). These instruments were used for data collection. The instruments adapted from Joseph (2017), it comprises of 20 questions for situational interest and 20 question for attitudes. The instrument is a five-point likert scale with Strongly Agreed (SA) Agree (A) Undecided (U) Disagree (D) Strongly Disagree (SD).

3.5 Validation of the Instrument

The instruments were given to four experts, one from Department of Educational Psychology COE Minna and three Science Educators in the Department of Science Education of the Federal University of Technology, Minna both face and content validation of the instruments were critically examining by these experts, the suitability and appropriateness of the items, the clarity and adequacy of language, among others were

examined. Their comments, corrections and suggestions were used by the researcher to produce the final copies of the instruments to be used for the study.

3.6 Reliability of the Instrument

To ensure the consistency of the instruments for data collection, a pilot test was conducted using 49 students in one of the schools in the study area but not among the school sampled for the study. Split-half method was used to obtain two sets of data, situational interest and attitude during pilot test. The two data obtained were analyzed using Cronbach Alpha, and the reliability coefficient obtained was, 0.77 and 0.78.

3.7 Method of Data Collection

The researcher collected a research permit from the Head of the Department, and there after visits the schools to seek permission from the school administrators to carry out the research. Also inform the respondents of the purpose and significance of the study. The researcher was granted permission and then appointed research assistants in each of the selected Schools and also trained them on how the research would be conducted. The instruments were administered on the students of the sampled secondary schools. The data collected from the sampled schools were analysed.

3.8 Methods of Data Analysis

The data collected were analysed using descriptive and inferential statistics. Mean, standard deviation and mean rank were used to answer the research questions, while the null hypotheses analysed using Mann whitney U-test at 0.05 level of significance with the use of computer software Statistical Package for Social Science (SPSS) version 23.0.

CHAPTER FOUR

4.0 RESULTS AND DISCUSSION

4.1 Results

Research Question One: What is students' situational interest towards learning of basic science and technology in upper basic education level?

Mean and standard deviation were used to answer research question one as presented in Table 4.1

Table 4.1: Mean and Standard Deviation of students' situational interest towards learning of basic science and technology in upper basic education level

S/N	Items	N	Mean	Std.	Decision
1	I am interested in Basic Science and Technology Classroom	382	3.68	1.34	Interested
2	Basic Science and Technology is a difficult Subject to Learn.	382	3.21	1.34	Interested
3	I found Basic Science and Technology easy to learn.	382	3.45	1.25	Interested
4	I remain focused while in Basic Science and Technology classroom.	382	3.50	1.30	Interested
5	Basic Science and Technology classes are always full of fun to me.	382	3.55	1.28	Interested
6	Each content taught in Basic Science and Technology class always look new to me.	382	3.53	1.24	Interested
7	I find Basic Science and Technology to be irrelevant subject to my life.	382	1.67	.59	Not Interested
8	I am always bored when Basic Science and Technology is been taught.	382	3.46	1.17	Interested
9	I feel motivated while learning Basic Science and Technology.	382	3.56	1.24	Interested

10	I found Basic Science and Technology easy to comprehend.	382	3.47	1.22	Interested
11	Basic Science and Technology is important to my life as it is the beginning of sciences	382	3.51	1.15	Interested
12	The students in Basic Science and Technology class perform average than in other subjects.	382	3.63	1.22	Interested
13	Some students perform below average in Basic Science and Technology subject	382	3.42	1.25	Interested
14	In Basic Science and Technology class, we are almost within same age bracket.	382	3.23	1.33	Interested
15	Among all the subjects, basic science and technology subject is always in competition with other subjects.	382	3.25	1.34	Interested
16	In Basic Science and Technology class, am always distracted by my colleagues	382	1.84	.48	Not Interested
17	In Basic Science and Technology class, I develop more confidence.	382	3.06	1.37	Interested
18	I don't think about other things when am in Basic Science and Technology class because I am highly motivated by the subject	382	3.16	1.34	Interested
19	I don't like the way Basic Science and Technology subject is been taught by my teacher	382	1.43	.57	Not Interested
20	I always score higher marks in Basic Science and Technology test than in other subjects.	382	3.10	1.32	Interested
	Grand Mean		3.14	1.17	Interested

Decision Mean 3.0

Table 4.1 shows the mean and standard deviation of students' situational interest towards learning of basic science and technology in upper basic education level. The respondents are in agreement with the items stated in the research instrument on situational interest towards learning of basic science and technology. Also, the items mean rating which ranged between 3.10 and 3.68 are all considered accepted based on the decision mean of 3.0. Except items 7, 16 and 19 that is less than 3.0. The implication is that, student's situational interest towards learning of basic science and technology is favourable since 17 out of 20 items indicated very positive, based on decision mean of 3.0.

Research Question Two: What is students' attitude towards learning basic science and technology at upper basic education level?

Mean and standard deviation were used to answer research question two as presented in Table 4.2

Table 4.2: Mean and Standard Deviation of students' attitude towards learning basic science and technology at upper basic education level

SN	Item	N	Mean	Std.	Decision
1	I try hard to do well in basic science and technology	382	3.80	1.15	Positive
2	I work as hard as I can in basic science and technology lesson	382	3.58	1.16	Positive
3	When I'm in basic science and technology lesson, I participate actively in class discussion.	382	3.40	1.16	Positive
4	I pay attention to Basic Science and Technology lesson.	382	3.49	1.17	Positive
5	When I'm in Basic Science and Technology lessons I listen very carefully and attentive.	382	3.50	1.19	Positive
6	When I'm in Basic Science and Technology lessons I feel motivated to learn more.	382	3.55	1.22	Positive

7	When we do class activity in Basic Science and Technology lessons, I feel interested.	382	3.49	1.20	Positive
8	The Basic Science and Technology lesson is full of fun to me.	382	3.45	1.27	Positive
9	I enjoy learning new things in Basic Science and Technology class lesson.	382	3.51	1.20	Positive
10	When we do class activity in Basic Science and Technology lesson, I get involved.	382	3.48	1.20	Positive
11	I am always motivated by the teacher to learn, when I'm in Basic Science and Technology lesson.	382	3.49	1.21	Positive
12	I don't try very hard in Basic Science and Technology lesson due to my teacher's method of teaching.	382	2.20	.60	Negative
13	The environment encourages me to do more in Basic Science and Technology lesson.	382	3.37	1.19	Positive
14	When I'm in Basic Science and Technology lesson, I think about other things due to influence of my peers	382	3.50	1.26	Positive
15	When I'm in Basic Science and Technology lesson, my mind wonders due to poor school infrastructure	382	2.02	.84	Negative
16	When we work on concepts in Basic Science and Technology lesson, I feel bored.	382	3.35	1.27	Positive
17	When we conduct practical in Basic Science and Technology lesson, I feel nervous due to absence of the teacher.	382	3.28	1.28	Positive
18	When we work on a new concept in Basic Science and Technology lesson, I feel discouraged because of over population.	382	2.17	.81	Negative
19	The Basic Science and Technology lesson is not all that fun to me	382	2.06	.81	Negative
20	When I'm in Basic Science and Technology lesson, I feel bad due to teacher's poor classroom management.	382	2.24	.83	Negative
	Grand Mean		3.15	1.10	Negative

Decision Mean 3.0

Table 4.2 shows the mean and standard deviation of students' attitude towards learning basic science and technology at upper basic education level. The respondents are in agreement with the items stated in the research instrument on students' attitude towards learning basic science and technology at upper basic education level. Also the items mean rating which ranged between 3.08 and 3.60 are all considered positive based on the decision mean of 3.0. Except items 12, 15, 18, 19 and 20 that is less than 3.0. The implication is that, students' attitude towards learning basic science and technology at upper basic education level is favourable since 15 out of 20 items indicated positive, based on decision mean of 3.0.

Research Question Three: Does any difference exists between the female and male students' situational interest towards learning basic science and technology at upper basic education level?

Mean rank was used to answer research question three as presented in Table 4.3

Table 4.3: Mean ranking of female and male students' situational interest towards learning basic science and technology at upper basic education level

Gender	N	Mean Rank
Male	262	172.45
Female	120	202.82

Table 4.3 shows the mean rank of male and female students' situational interest towards learning basic science and technology at upper basic education level. From the result, the mean rank of male is 172.45 while female mean rank is 202.82. This indicated that female students had higher mean rank than the male counterpart on their situational interest towards learning basic science and technology at upper basic education level.

Research Question Four: Does any difference exists between the male and female students' attitude towards learning basic science and technology at upper basic education level?

Mean rank was used to answer research question four as presented in Table 4.4

Table 4.4: Mean ranking of male and female students' attitude towards learning of basic science and technology at upper basic education level

Gender	N	Mean Rank
Male	262	171.55
Female	120	204.02

Table 4.4 shows the mean ranking of male and female students' attitude towards learning basic science and technology at upper basic education level. From the result, the mean rank of male and female students are $\bar{X}$ = 171.55 and $\bar{X}$ = 204.02 respectively. This indicated that female students had higher mean rank than the male counterpart on their attitude towards learning basic science and technology at upper basic education level.

Research Question Five: How do students' school location influence their situational interest towards learning basic science and technology at upper basic education level?

Mean rank was used to answer research question five as presented in Table 4.5

Table 4.5: Mean ranking on how students school location influence their situational interest towards learning basic science and technology at upper basic education level

School Location	N	Mean Rank
Rural	90	182.36
Urban	292	194.32

Table 4.5 shows the mean rank on how students' school location influence their situational interest towards learning basic science and technology at upper basic education level. The result revealed that the mean rank of students from rural areas is 182.36 on their situational interest towards learning basic science and technology at upper basic education level. While, the mean rank of students from urban areas is 194.32. This indicated that students from the urban areas had higher mean rank than those from the rural areas on their

situational interest towards learning basic science and technology at upper basic education level.

Research Question Six: How do students' school location influence their attitude towards learning basic science and technology at upper basic education level?

Mean rank was used to answer research question six as presented in Table 4.6

Table 4.6: Mean rank on how students school location influence their attitude towards learning basic science and technology at upper basic education level

School Location	N	Mean Rank
Rural	90	190.61
Urban	292	191.78

Table 4.6 shows the mean rank on how students' school location influence their attitude towards learning basic science and technology at upper basic education level. The result revealed that the mean rank of students from rural areas is 190.61 on their attitude towards learning basic science and technology at upper basic education level. While, the mean rank of students from urban areas is 191.78. This indicated that students from the urban areas had higher mean rank than those from the rural areas on their attitude towards learning basic science and technology at upper basic education level.

4.2 Testing of Hypothesis

Hypothesis One: There is no significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level.

Mann-Whitney U-test was used to test hypothesis one as presented in Table 4.7

Table 4.7: Mann-Whitney U-test of male and female students' situational interest towards learning basic science and technology at upper basic education level

Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Male	262	172.45	36386.0				
				14020.0	36386.0	-2.706	0.00
Female	120	202.82	32249.0				

Table 4.7 shows Mann-Whitney U-test on male and female students' situational interest towards learning basic science and technology at upper basic education level. The hypothesis that stated no significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level was tested. The table shows p-value = 0.00, since, $p < 0.05$, HO_1 was accepted. Therefore, there was significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level in favour of female students.

Hypothesis Two: There is no significant difference between the female and male students' attitude towards learning basic science and technology at upper basic education level.

Mann-Whitney U-test was used to test hypothesis two as presented in table 4.8.

Table 4.8: Mann-Whitney U-test of female and male students' attitude towards learning basic science and technology at upper basic education level

Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Male	262	171.55	36196.50				
				13830.500	36196.500	-2.893	0.00
Female	120	204.02	32438.50				

Table 4.8 shows Mann-Whitney U-test on male and female students' attitude towards learning basic science and technology at upper basic education level. The hypothesis that stated no significant difference between the female and male students' attitude towards learning basic science and technology at upper basic education level was tested. The table show p-value = 0.00, since, $p < 0.05$, HO_2 was rejected. Therefore, there was significant difference between the female and male students' attitude towards learning basic science and technology at upper basic education level in favour of female students.

Hypothesis Three: There is no significant difference between the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level.

Mann-Whitney U-test was used to test hypothesis three as presented in table 4.9

Table 4.9: Mann-Whitney U-test on the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level

School Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Rural	90	182.36	16412.50	12317.500	16412.500	-.899	.369
Urban	292	194.32	56740.50				

Table 4.9 shows Mann-Whitney U-test on situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level. The hypothesis that stated no significant difference between the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level was tested. The table shows p-value = 0.369, since, $p > 0.05$, HO_3 was accepted. Therefore, there was no significant difference between the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level.

Hypothesis Four: There is no significant difference between the attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level.

Mann-Whitney U-test was used to test hypothesis four as presented in table 4.10

Table 4.10: Mann-Whitney U-test on the attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level

School Location	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Wilcoxon W	Z	Sig.
Rural	90	190.61	17154.50	13059.500	17154.500	-.088	.930
Urban	292	191.78	55998.50				

Table 4.10 shows Mann-Whitney U-test on attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level. The hypothesis that stated no significant difference between the attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level was tested. The table shows p-value = 0.930, since, $p > 0.05$, HO_4 was accepted. Therefore, there was no significant difference between the attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level.

4.3 Major Findings of the Study

The following are the findings of the study:

i. students' situational interest towards learning of basic science and technology is favourable;
ii. students' attitude towards learning basic science and technology at upper basic education level is favourable;

iii. there was significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level;

iv. there was significant difference between the female and male students' attitude towards learning basic science and technology at upper basic education level;

v. there was no significant difference between the situational interest of students from urban and rural areas towards learning basic science and technology at upper basic education level;

vi. there was no significant difference between the attitude of students from urban and rural areas towards learning basic science and technology at upper basic education level.

4.4 Discussion of Findings

There is positive students' situational interest towards learning of basic science and technology in upper basic education level. This is in support of the work of Jerome (2016) who investigates interest development, arousing situational interest affects the growth trajectory of individual interest. The results of latent growth curve modeling revealed that only the group receiving problems experienced repeated arousal of situational interest and its related growth in individual interest.

There is positive students' attitude towards learning basic science and technology at upper basic education level. This finding is in line with the finding of Falode *et al.* (2016) who investigated effectiveness of computer simulation instruction on the attitude of geography students towards map reading. The results indicated that there was significant difference between the attitude scores of the two groups in favour of students exposed to computer simulation instructional package.

There was significant difference between the male and female students' situational interest towards learning basic science and technology at upper basic education level. This finding is in agreement with the study of Linnenbrink-Garcia *et al.* (2010) who investigated measuring situational interest in academic domains among undergraduates' students. The results revealed no reliable differences between the groups on gender, year in college, class, or course grades. It is also concurring with the findings Jerry and Robert (2011) who investigated a study on situational interest, computer self-efficacy and self-regulation: their impact on student engagement in distance education in large research University. Situational interest and self-regulation were found to be significantly correlated with three types of engagement (behavioral, emotional and cognitive), while computer self-efficacy did not appear to be associated with any of those engagement variables.

There was significant difference between the female and male students' attitude towards learning basic science and technology at upper basic education level. This is in disagreement with the findings of Asifa (2018) who investigate the attitude of students towards information technology and science education. The results of the study, revealed that number of internet users increase continuously. Statistically, non-significant difference was observed between male and female respondents towards the use of e-resources for learning and entertainment purpose. The study further, revealed that students both males and females were of the opinion that knowledge of IT is very important for science education. Also contrary with the findings Mohammed (2020) who carried out a study to assess attitudes towards science and technology middle school students in Kwara state, Nigeria. Results indicated that there is a positive attitude towards science and technology among students. However, there was not a positive attitude towards some items of science and technology. The results also showed that there is a meaningful difference between males and females points of views in attitude towards sciences and technology.

According to this result, males have higher averages than the females. It is also aligning with findings of Chang *et al.* (2014) on Taiwanese students' attitudes about science and technology, learning interests and life experiences in Taiwan. The results indicated that boys showed higher learning interests in sustainability issues and scientific topics than girls. However, girls recalled more life experiences about science and technology in life than boys.

There was no significant difference in the location of students on the situational interest towards learning basic science and technology at `upper basic education level. This is in agreement with the findings of Cedric *et al* (2019) who investigated effects of situational interest dimensions on students' learning strategies in physical education. The results showed that exploration intention positively predicts the learning strategies used by students. To motivate students and enhance their learning strategies, teachers could consider designing learning tasks that require higher-order cognitive processes demanding active exploration.

There was no significant difference in the students' attitude based on location towards learning basic science and technology at upper basic education level. This is in agreement with the finding of Gracemary (2017) who examined the effects of classroom variables such as class size, classroom settings, classroom management skills, classroom lightings, proper thermal conditions, student-student interaction, location of student and teacher-student interaction on students with positive and those with negative attitude to learning outcomes in Basic Technology among Secondary School Students in Cross River State. The result revealed that there is significant difference in all the classroom variables including students' location.

CHAPTER FIVE

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Based on the findings in this study, the following conclusion were drawn: the failure rate of students in basic science and technology at upper basic education level will be curtailed if students' situational interest and attitude is enhanced in teaching and learning process of basic science and technology in upper basic education level. Students will perform better in basic science and technology when the students' situational interest and attitude is strengthening. Hence, improving students' academic performance in basic technology.

5.2 Recommendations

The following recommendations were made:

1. Upper basic education teachers should give more priority to teaching of basic science and technology at upper basic education level especially in the present day of professional best practice of self-reliance.
2. The authorities should encourage, provide appropriate facilities for the teaching and learning of basic science and technology, so as to increase students situational interest and attitude towards the subject at upper basic level.
3. Basic training should be organized on how basic science and technology students can make use of instructional facilities, in order to help them to acquire basic skills.
4. The government of Nigeria, as the major stakeholder and policy maker on the direction of education should as a matter of serious concern formulate laws either by act of parliament or executive extant laws direct the ministry of education to institute man power development and capacity building strategies. This will avail students' especially the female gender opportunity to brace up with their male counterparts in basic science and technology.

5.3 Limitations to the Study

The following are the limitations of this study:

1. The study was limited to basic science and technology at upper basic education level in Minna, other states were not selected as part of the sample for this study.
2. Selection of sample was limited to public secondary schools in Minna, Niger State

5.4 Contributions to Knowledge

The study has added to the pool of knowledge in the following ways:

1. The study contributed to the existing literature on situational and attitude and provided a platform for further researches on attitude and situational interest in basic science and technology.
2. The study has established the roles of attitude and situational interest towards learning of basic science and technology. The study further establishes that at $p < 0.05$, there was significant difference in (male and female) and (urban and rural) students on situational interest towards learning basic technology, and similarly at at $p < 0.05$, there was significant difference in attitude of (male and female) and (urban and rural) students towards learning basic science and technology
3. The study has designed questionnaires specifically on the situational interest and attitude towards learning Basic Science and Technology at Upper Basic Education level in Minna, Niger State.

5.5 Suggestions for Further Studies

For further researches in this area, the following suggestions were made:

1. Similar study could be carried out on assessing students' situational interest and attitude towards learning of basic science and technology in other education levels.

2. Similarly, study could be carried out on assessing students' situational interest and attitude towards learning of basic science and technology in other geographical locations of the country.

Study should be carried out on the assessing students' situational interest and attitude in other subject areas.

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APPENDIX A

RELIABILITY ANALYSIS

Case Processing Summary

		N	%
Cases	Valid	49	100.0
	Excluded[a]	0	.0
	Total	49	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.777	20

Case Processing Summary

		N	%
Cases	Valid	49	100.0
	Excluded[a]	0	.0
	Total	49	100.0

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

Reliability Statistics

Cronbach's Alpha	N of Items
.782	20

APPENDIX B

QUESTIONNAIRE

Dear Respondent,

This questionnaire is designed to get your responses on the above subject matter. Any responses given will be used strictly for this study and with utmost confidentiality.

SECTION 'A': Respondent's Data

Name of School……

Gender: Male ☐ Female ☐

Locatio: Urban ☐ Rural ☐

SECTION 'B': Basic Science and Technology Situational Interest Questionnaire (BSTSSIQ)

Note: SA (Strongly Agreed); A (Agreed) U (Undecided); D (Disagree); SD (Strongly Disagreed)

Q1 what is the students' situational interest towards learning basic science and technology in upper basic education level?

S/N	ITEMS	SA	A	U	D	SD
1.	I am interested in Basic Science and Technology Classroom					
2.	Basic Science and Technology is a difficult Subject to Learn.					
3.	I found Basic Science and Technology easy to learn.					
4.	I remain focused while in Basic Science and Technology classroom.					
5.	Basic Science and Technology classes are always full of fun to me.					
6.	Each content taught in Basic Science and Technology class always look new to me.					
7.	I find Basic Science and Technology to be irrelevant subject to my life.					
8.	I am always bored when Basic Science and Technology is been taught.					
9.	I feel motivated while learning Basic Science and Technology.					
10.	I found Basic Science and Technology easy to comprehend.					
11.	Basic Science and Technology is important to my life as it is the beginning of sciences					
12.	The students in Basic Science and Technology class perform average than in other subjects.					

13.	Some students perform below average in Basic Science and Technology subject					
14.	In Basic Science and Technology class, we are almost within same age bracket.					
15.	Among all the subjects, basic science and technology subject is always in competition with other subjects.					
16.	In Basic Science and Technology class, am always distracted by my colleagues					
17.	In Basic Science and Technology class, I develop more confidence.					
18.	I don't think about other things when am in Basic Science and Technology class because I am highly motivated by the subject					
19.	I don't like the way Basic Science and Technology subject is been taught by my teacher					
20.	I always score higher marks in Basic Science and Technology test than in other subjects.					

Q2 what is the students' attitude towards learning basic science and technology at upper basic education level? **(Basic Science and Technology Student Attitude Questionnaire) BSTSAQ**

S/N	**ITEMS**	**SA**	**A**	**N**	**D**	**SD**
21	I try hard to do well in basic science and technology					
22	I work as hard as I can in basic science and technology lesson					
23	When I'm in basic science and technology lesson, I participate actively in class discussion.					
24	I pay attention to Basic Science and Technology lesson.					
25	When I'm in Basic Science and Technology lessons I listen very carefully and attentive.					
26	When I'm in Basic Science and Technology lessons I feel motivated to learn more.					
27	When we do class activity in Basic Science and Technology lessons, I feel interested.					
28	The Basic Science and Technology lesson is full of fun to me.					
29	I enjoy learning new things in Basic Science and Technology class lesson.					
30	When we do class activity in Basic Science and Technology lesson, I get involved.					
31	I am always motivated by the teacher to learn, when I'm in Basic Science and Technology lesson.					

32	I don't try very hard in Basic Science and Technology lesson due to my teacher's method of teaching.					
33	The environment encourages me to do more in Basic Science and Technology lesson.					
34	When I'm in Basic Science and Technology lesson, I think about other things due to influence of my peers					
35	When I'm in Basic Science and Technology lesson, my mind wonders due to poor school infrastructure					
36	When we work on concepts in Basic Science and Technology lesson, I feel bored.					
37	When we conduct practicals in Basic Science and Technology lesson, I feel nervous due to absence of the teacher.					
38	When we work on a new concept in Basic Science and Technology lesson, I feel discouraged because of over population.					
39	The Basic Science and Technology lesson is not all that fun to me					
40	When I'm in Basic Science and Technology lesson, I feel bad due to teacher's poor classroom management.					

Thank You

SALIHU MOHAMMED ABDULLAHI

APPENDIX C

KREJCIE AND MORGAN TABLE FOR DETERMINING POPULATION SIZE

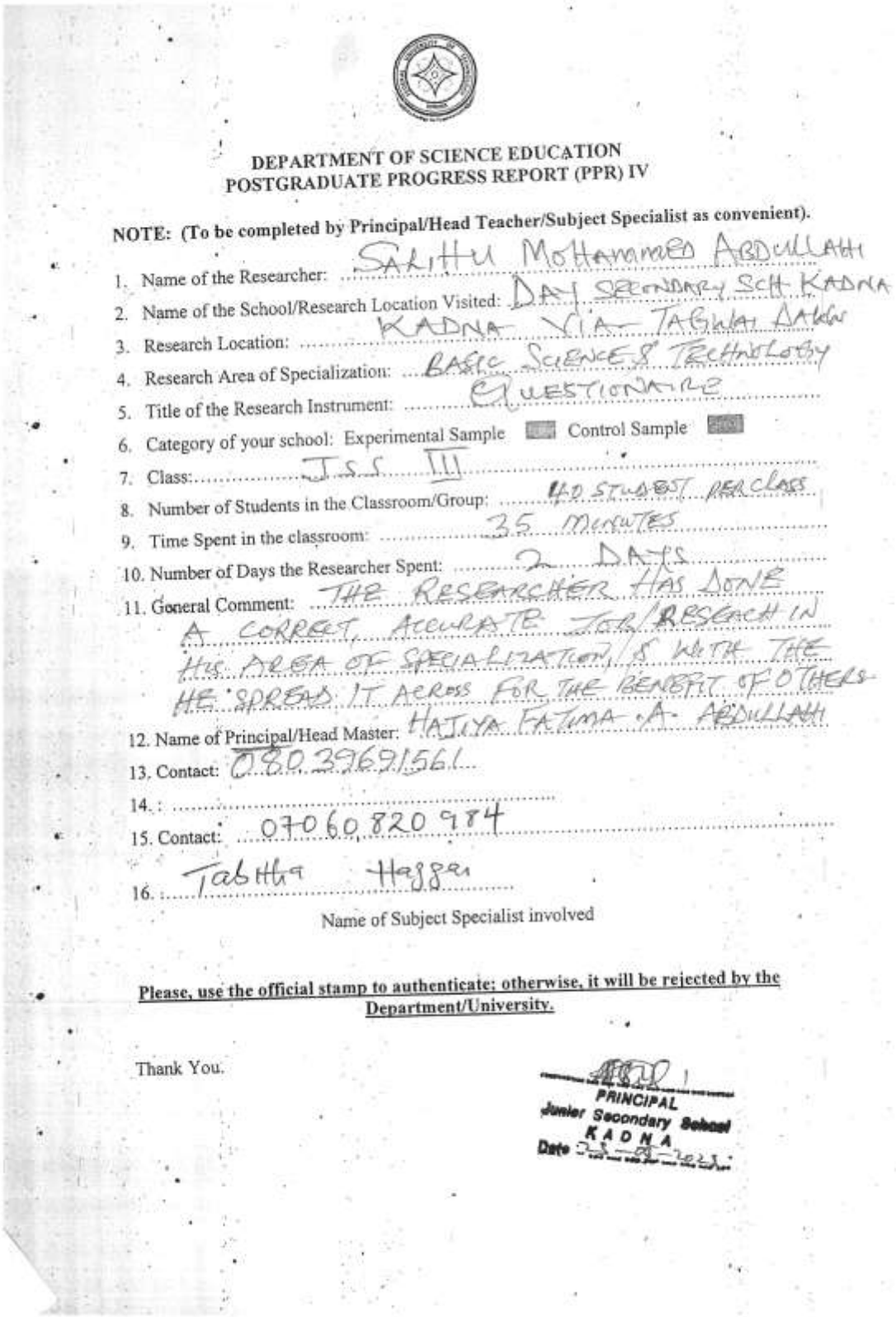
TABLE 1
Table for Determining Sample Size from a Given Population

N	*S*	*N*	*S*	*N*	*S*
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

Note.—*N* is population size.
S is sample size.

APPENDIX D

PROGRESS REPORT FORM FROM THE VISITED SCHOOL



DEPARTMENT OF SCIENCE EDUCATION
POSTGRADUATE PROGRESS REPORT (PPR) IV

NOTE: (To be completed by Principal/Head Teacher/Subject Specialist as convenient).

1. Name of the Researcher: SALIHU MOHAMMED ABDULLAHI
2. Name of the School/Research Location Visited: DAY SECONDARY SCH KADNA
3. Research Location: KADNA VIA TAGWAI DAMM
4. Research Area of Specialization: BASIC SCIENCE & TECHNOLOGY
5. Title of the Research Instrument: QUESTIONAIRE
6. Category of your school: Experimental Sample ☐ Control Sample ☐
7. Class: JSS III
8. Number of Students in the Classroom/Group: 40 STUDENT PER CLASS
9. Time Spent in the classroom: 35 MINUTES
10. Number of Days the Researcher Spent: 2 DAYS
11. General Comment: THE RESEARCHER HAS DONE A CORRECT, ACCURATE JOB/RESEARCH IN HIS AREA OF SPECIALIZATION, I WISH THE HE SPREAD IT ACROSS FOR THE BENEFIT OF OTHERS
12. Name of Principal/Head Master: HAJIYA FATIMA A. ABDULLAHI
13. Contact: 080 3969 1561
14. :
15. Contact: 07060820984
16. Tabitha Haggai

Name of Subject Specialist involved

Please, use the official stamp to authenticate; otherwise, it will be rejected by the Department/University.

Thank You.

PRINCIPAL
Junior Secondary School
KADNA
Date 25-8-2023

DEPARTMENT OF SCIENCE EDUCATION
POSTGRADUATE PROGRESS REPORT (PPR) IV

NOTE: (To be completed by Principal/Head Teacher/Subject Specialist as convenient).

1. Name of the Researcher: SALIHU MOHAMMED ABDULLAHI
2. Name of the School/Research Location Visited: Day Secondary School, Birgi.
3. Research Location: Along Talba's farm
4. Research Area of Specialization: Basic Science and Technology
5. Title of the Research Instrument: Questionaire on Interest and attitude
6. Category of your school: Experimental Sample ☐ Control Sample ☐
7. Class: J.S.S 3
8. Number of Students in the Classroom/Group: 27
9. Time Spent in the classroom: One hour (1hr)
10. Number of Days the Researcher Spent: Two days
11. General Comment: From the researcher to the researcel conduct where all sabsfactory and successful.
12. Name of Principal/Head Master: Mallama Fahima Binta Abubakar
13. Contact: 08060428472
14. : 08038257563
15. Contact:
16. Mal. Abdulsalam Surajo, Mal. Adamu Ereya.

Name of Subject Specialist involved

SECONDARY SCHOOL BIRGI
ACADEMIC
SIGN -
DATE 22/5/2025

Please, use the official stamp to authenticate; otherwise, it will be rejected by the Department/University.

Thank You.

DEPARTMENT OF SCIENCE EDUCATION
POSTGRADUATE PROGRESS REPORT (PPR) IV

NOTE: (To be completed by Principal/Head Teacher/Subject Specialist as convenient).

1. Name of the Researcher: SALIHU MOHAMMED ABDULLAHI
2. Name of the School/Research Location Visited: ZARUMAI MODEL SCHOOL MINNA
3. Research Location: MINNA NIGER STATE
4. Research Area of Specialization: BASIC SCIENCE/TECHNOLOGY
5. Title of the Research Instrument: QUESTIONAIRE
6. Category of your school: Experimental Sample ☐ Control Sample ☐
7. Class: J.S.S 3
8. Number of Students in the Classroom/Group: 115
9. Time Spent in the classroom: 45MINS. EACH(3 CLASSES)
10. Number of Days the Researcher Spent: 3 DAYS
11. General Comment: WELL BEHAVE STUDENTS
12. Name of Principal/Head Master: Abdulkadir Abubakar
13. Contact: 070[illegible]
14. Sign: PRINCIPAL ZARUMAI MODEL SCHOOL MINNA NIGER STATE
15. Contact: 08[illegible] OR 08030472879
16. Signature: RAHAMATU LAMINAT

Name of Subject Specialist involved

Please, use the official stamp to authenticate; otherwise, it will be rejected by the Department/University.

Thank You.

DEPARTMENT OF SCIENCE EDUCATION
POSTGRADUATE PROGRESS REPORT (PPR) IV

NOTE: (To be completed by Principal/Head Teacher/Subject Specialist as convenient).

1. Name of the Researcher: SALIHU MOHAMMED ABDULLAHI
2. Name of the School/Research Location Visited: O.S.S BARKIN SALE
3. Research Location: MINNA
4. Research Area of Specialization: Basic Science/Technology
5. Title of the Research Instrument: Questionnaire
6. Category of your school: Experimental Sample ☐ Control Sample ☐
7. Class: J.S.S III
8. Number of Students in the Classroom/Group: 188
9. Time Spent in the classroom: 45 MINS EACH (3 CLASSES)
10. Number of Days the Researcher Spent: 3 DAYS
11. General Comment: A very Co-ordinated Research. Majority of the Students who Serve as the population, were interested.
12. Name of Principal/Head Master: YUSUF A. RAFA'A
13. Contact: 07065809780
14. : .....
15. Contact: 08052601576
16. SHERIFFDEEN ADELOLE 08063657[illegible] 12/05/2023

Name of Subject Specialist involved

VICE PRINCIPAL I
GAT SECONDARY SCHOOL
BARKIN SALE, MINNA

Please, use the official stamp to authenticate; otherwise, it will be rejected by the Department/University.

Thank You.

APPENDIX E

INSTRUMENT VALIDATION

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
DEPARTMENT OF SCIENCE EDUCATION

POSTGRADUATE INSTRUMENT VALIDATION FORM
(PIVAF)

NOTE: This form must be attached to the instrument and objectives/hypotheses of the study to the validator.

1. NAME OF THE VALIDATOR: Ass. Prof IBRAHIM, I. KUTA
2. SCHOOL/INSTITUTION/DEPARTMENT: SSTE/EDUTECH
3. TEL. PHONE NUMBER: 08035837865
4. E-MAIL ADDRESS: —
5. NAME OF THE CANDIDATE:
6. MATRIC/ NO.:
7. APPROVED THESIS TITLE:
8. TITLE OF THE INSTRUMENT(s):

Instruction: Please, you are requested to make input or corrections where necessary.

S/No.	Categories	Appropriate	Not appropriate
1	Is the outlook of the instrument appropriate to the respondents?	✓	
2	Are the word processing and layout of the instrument appropriate?	✓	
3	Are the items generated in the instrument appropriate?	✓	
4	Are the items enough and appropriate to generate a valid conclusion on the construct to be observed?	✓	
5	Are the items generated appropriate to the objectives of the study?	✓	
6	Are the items generated appropriate to provide valid responses or answers to the research and hypotheses raised in the study?	✓	
7	Do you consider the whole instrument appropriate for the study?	✓	

9. GENERAL REMARK: Effects all the corrections pointed out subject to your supervisors agreement
10. NAME AND SIGNATURE: Ass. Prof. I. I. Kuta
10/01/23

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
DEPARTMENT OF SCIENCE EDUCATION

POSTGRADUATE INSTRUMENT VALIDATION FORM
(PIVAF)

NOTE: This form must be attached to the instrument and objectives/hypotheses of the study to the validator.

1. NAME OF THE VALIDATOR: AHMED, Attahiru Alhaji
2. SCHOOL/INSTITUTION/DEPARTMENT: EDUCATIONAL PSYCHOLOGY C.O.E MINNA
3. TEL. PHONE NUMBER: 07068972983
4. E-MAIL ADDRESS: attahiruahmedalhaji@gmail.com
5. NAME OF THE CANDIDATE: SALIHU MOHAMMED ABDULLAHI
6. MATRIC/NO.: M.TECH/SSTE/2018/9319
7. APPROVED THESIS TITLE: STUDENTS SITUATIONAL INTEREST AND ATTITUDE TOWARDS LEARNING OF BASIC SCIENCE AND TECHNOLOGY AT UPPER BASIC EDUCATION LEVEL IN MINNA, NIGER STATE
8. TITLE OF THE INSTRUMENT(s): STUDENTS SITUATIONAL INTEREST AND ATTITUDE QUESTIONNAIRE (SSIAQ).

Instruction: Please, you are requested to make input or corrections where necessary.

S/No.	Categories	Appropriate	Not Appropriate
1	Is the outlook of the instrument appropriate to the respondents?	✓	
2	Are the word processing and layout of the instrument appropriate?	✓	
3.	Are the items generated in the instrument appropriate?	✓	
4	Are the items enough and appropriate to generate a valid conclusion on the construct to be observed?	✓	
5	Are the items generated appropriate to the objectives of the study?	✓	
6	Are the items generated appropriate to provide valid responses or answers to the research and hypotheses raised in the study?	✓	
7	Do you consider the whole instrument appropriate for the study?	✓	

9. GENERAL REMARK: Satisfactory but, the instrument should improve on attitudinal aspect of the one used
10. NAME AND SIGNATURE: AHMED, Attahiru Alhaji

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
DEPARTMENT OF SCIENCE EDUCATION

POSTGRADUATE INSTRUMENT VALIDATION FORM
(PIVAF)

NOTE: This form must be attached to the instrument and objectives/hypotheses of the study to the validator.

1. NAME OF THE VALIDATOR: Muhammed Saifullahi
2. SCHOOL/INSTITUTION/DEPARTMENT: F.U.T. Minna / Science Edu
3. TEL. PHONE NUMBER: 08033650244
4. E-MAIL ADDRESS: Msaifullahi.fum@gmail.com
5. NAME OF THE CANDIDATE: SALIHU Mohammed ABDULLAHI
6. MATRIC/ NO.: M.Tech/SSTE/2018/9319
7. APPROVED THESIS TITLE: .....
8. TITLE OF THE INSTRUMENT(s): .....

Instruction: Please, you are requested to make input or corrections where necessary.

S/No.	Categories	Appropriate	Not appropriate
1	Is the outlook of the instrument appropriate to the respondents?	✓	
2	Are the word processing and layout of the instrument appropriate?	✓	
3	Are the items generated in the instrument appropriate?	✓	
4	Are the items enough and appropriate to generate a valid conclusion on the construct to be observed?	✓	
5	Are the items generated appropriate to the objectives of the study?	✓	
6	Are the items generated appropriate to provide valid responses or answers to the research and hypotheses raised in the study?	✓	
7	Do you consider the whole instrument appropriate for the study?	✓	

9. GENERAL REMARK: The Instrument is Okay
10. NAME AND SIGNATURE: Muhammed SAIFULLAHI

FEDERAL UNIVERSITY OF TECHNOLOGY MINNA
DEPARTMENT OF SCIENCE EDUCATION

POSTGRADUATE INSTRUMENT VALIDATION FORM
(PIVAF)

NOTE: This form must be attached to the instrument and objectives/hypotheses of the study to the validator.

1. NAME OF THE VALIDATOR: Dr. O. C. Falade
2. SCHOOL/INSTITUTION/DEPARTMENT: F.U.T. Minna
3. TEL. PHONE NUMBER:
4. E-MAIL ADDRESS: [illegible]@gmail.com
5. NAME OF THE CANDIDATE: Salihu Mohammed Abdullahi
6. MATRIC/ NO.:
7. APPROVED THESIS TITLE:

8. TITLE OF THE INSTRUMENT(s): Questionnaire on Students' Structural Interest and Attitude towards Learning of Basic Science & Tech

Instruction: Please, you are requested to make input or corrections where necessary.

S/No.	Categories	Appropriate Yes	Not Appropriate No
1	Is the outlook of the instrument appropriate to the respondents?		
2	Are the word processing and layout of the instrument appropriate?	These items are	
3	Are the items generated in the instrument appropriate?	questions. They	
4	Are the items enough and appropriate to generate a valid conclusion on the construct to be observed?	therefore require "Yes or No"	
5	Are the items generated appropriate to the objectives of the study?	responses not	
6	Are the items generated appropriate to provide valid responses or answers to the research and hypotheses raised in the study?	"Appropriate, Not Appropriate"	
7	Do you consider the whole instrument appropriate for the study?		

9. GENERAL REMARK: Minor corrections suggested.
10. NAME AND SIGNATURE: Dr. O. C. Falade

APPENDIX F
SUBEB NIGER STATE 2021/2022
POPULATION DISTRIBUTION OF UPPER BASIC EDUCATION LEVEL IN JUNIOR SECONDARY SCHOOLS' (JSS) IN NIGER EAST

LGAs	NAMES OF SCHOOLS	SCH. LOCATION	JSS ONE			JSS TWO			JSS THREE		
			M	F	Total	M	F	Total	M	F	Total
MUNYA	DSS,DANDAUDU	Rural	7	9	16	37	31	68	61	40	101
	DSS,GUNI	Rural	61	24	85	64	34	98	53	44	97
	GJSS SARKIN PAWA	Urban	277	212	489	276	216	492	260	226	486
RAFI	AHMADU ATTAHIRU SECONDARY SCHOOL KAGARA	Rural	175	169	344	171	86	257	126	163	289
	DAY SECONDARY SCHOOL TUNGAR-BAKO	Rural	75	70	145	37	21	58	39	17	56
	GOVERNMENT DAY SECONDARY SCHOOL PANDOGAR	Rural	0	190	186	376	154	153	307		
	GOVERNMENT GIRLS ARABIC SECONDARY SCHOOOL TEGINA	Rural	30	50	80	0	47	47	0	39	39
	GOVERNMENT SECONDARY SCHOOL TAGINA	Rural	188	130	318	136	72	208	246	117	363
	JSS PANGU-GARI	Rural	28	10	38	25	3	28	38	7	45
	JUNIOR SECONDARY SCHOOL KUNDU	Rural	50	14	64	45	10	55	35	10	45
	JUNIOR SECONDARY SCHOOL KWANA	Rural	100	53	153	60	34	94	60	30	90
	JUNIOR SECONDARY SCHOOL MADAKA	Rural	14	1	15	25	4	29	29	5	34
	JUNIOR SECONDARY SCHOOL MAIKUJERI	Rural	78	32	110	75	30	105	70	29	99
	JUNIOR SECONDARY SCHOOL UREGI	Rural	21	12	33	24	15	39	18	13	31
	JUNIOR SECONDARY SCHOOL, SABON TASHA USHIBA	Rural	0	25	2	27	29	4	33		
	MUHAMMADU INUWA DAY SECONDARY SCHOOL ,KUSHARKI	Rural	60	40	100	60	36	96	56	12	68
	SALIHU TANKO DAY SECONDARY SCHOOL KAGARA	Urban	121	210	331	116	218	334	119	225	344
	WOMEN DAY COLLEGE KAGARA	Urban	0	70	70	0	84	84	0	69	69
SHIRORO	DAY SECONDARY SCHOLL PINA	Rural	45	26	71	36	30	66	50	10	60
	DAY SECONDARY SCHOOL SHIRORO NEPA	Rural	94	62	156	100	68	168	112	74	186
	DAY SECONDARY SCHOOL,TUM TUM KUTA	Urban	303	85	388	294	49	343	274	97	371
	JUNIOR SECONDARY SCHOOL ZUMBA	Rural	93	66	159	143	31	174	94	34	128
BOSSO	ABDULLAHI DADA SECONDARY SCHOOL MAIKUNKELE	Urban	130	128	258	77	90	167	73	91	164
	BOSSO SECONDARY SCHOO MINNA	Urban	333	236	569	225	231	456	272	283	555
	DAY SECONDARY SCHOOL GARATU	Rural	173	96	269	119	112	231	130	108	238
	DAY SECONDARY SCHOOL KAMPALA	Rural	80	98	178	62	58	120	72	38	110
	DAY SECONDARY SCHOOL MAITUMBI	Urban	122	186	308	120	195	315	109	212	321
	DAY SECONDARY SCHOOL GBADA	Rural	125	90	215	145	120	265	140	120	260
	DAY SECONDARY SCHOOL CHANCHAGAB MINNA	Urban	215	213	428	265	236	501	196	230	426
	DAY SECONDARY SCHOOL MAIKUNKELE	Urban	67	44	111	77	61	138	88	105	193
	DAY SECONDARY SCHOOL SHATTA	Rural	54	44	98	39	40	79	67	26	93
	FEDERAL GOVERNMENT COLLEGE MINNA	Urban	166	119	285	113	110	223	118	125	243

	GOVERNMENT ARMY DAY SECONDARY SCHOOL MINNA	Urban	200	218	418	220	290	510	210	300	510
	GOVERNMENT JUNIOR SECODARY SCHOOL GURUSU	Urban	33	31	64	35	38	73	37	22	59
	GOVERNMENT JUNIOR SECONDARY SCHOOL BEJI	Rural	113	109	222	171	142	313	114	139	253
	GOVERNMT DAY SECONDARY SCHOOL PYATA	Rural	60	55	115	68	60	128	53	50	103
	HILLTOP MODEL SECONDARY SCHOOL	Urban	208	251	459	330	490	820	302	423	725
	JUNIOR SECONDARY SCHOOL KADNA	Rural	67	36	103	60	18	78	56	21	77
	JUNIOR SECONDARY SCHOOL BIRGI	Rural	1	1	2	20	17	37	20	8	28
	JUNIOR SECONDARY SCHOOL KODO BOSSO	Rural	25	10	35	30	10	40	32	10	42
	JUNIOR SECONDARY SCHOOL SHAKWATAA	Rural	17	14	31	21	19	40	15	12	27
	NIGER STATE SCHOOL FOR SPECIAL EDUCATION MINNA	Urban	18	10	28	25	11	36	8	7	15
	SHEIKH MUHAMMAD SAMBO COLLAGE OF ART AND ISLAMIC STUDIES	Urban	103	19	122	231	42	273	207	46	253
CHANCHAGA	AHMADU BAHAGO SECONDARY SCHOOL MINNA	Urban	548	197	745	377	215	592	395	200	595
	DAY JUNIOR SECONDARY SCHOOL BARKIN SALE	Urban	292	249	541	202	172	374	180	153	333
	DAY SECONDARY SCHOOL LIMAWA MINNA	Urban	677	245	922	646	272	918	418	250	668
	GBANGBAPI JUNIOR SECONDARY SCHOOL	Urban	280	225	505	230	210	440	185	220	405
	GOV ERNMENT GIRLS DAY SCIENCE COLLEGE, BOSSO ROAD, MINNA	Urban	0	649	649	0	608	608	0	569	569
	GOVERNMENT SEC SCH MINNA (FATHER OCONNELL)	Urban	593	0	593	631	0	631	554	0	554
	GOVT DAY SECONDARY SCHOOL BOSSO ROAD	Urban	489	61	550	575	46	621	314	36	350
	GOVT GIRLS SECONDARY SCHOOL OLD AIRPORT	Urban	0	545	545	0	815	815	0	895	895
	JSS SHANU-MINNA	Urban	192	147	339	213	128	341	142	99	241
	KWASAU JUNIOR SECONDARY SCHOOL	Urban	222	193	415	227	212	439	269	278	547
	WOMAN DAY COLLEGE	Urban	0	75	75	0	85	85	0	102	102
	ZARUMAI MODEL SCHOOL	Urban	165	140	305	158	149	307	186	150	336
GURARA	GOVERNMENT DAY SECONDARY SCHOOL LAMBATA	Rural	220	120	340	250	75	325	200	92	292
	GOVERNMENT DAY SECONDARY SCHOOL DIKKO	Rural	166	90	256	94	71	165	81	78	159
	GOVERNMENT DAY SECONDARY SCHOOL GAWU BABANGIDA	Urban	117	160	277	185	187	372	162	205	367
	GOVERNMENT DAY SECONDARY SCHOOL IZOM	Urban	55	22	77	114	95	209	119	99	218
	GOVERNMENT DAY SECONDARY SCHOOL LEFU	Rural	130	59	189	81	61	142	65	30	95
	GOVERNMENT DAY SECONDARY SCHOOL TUFA	Urban	64	48	112	60	32	92	61	35	96
	GOVERNMENT GIRLS ARABICS SECONDARY SCHOOL DIKKO	Rural	0	0	48	48	0	61	61		
	GOVERNMENT JUNIOR SECONDARY SCHOOL GWACIPE	Rural	75	43	118	65	45	110	43	43	86
	GOVERNMENT JUNIOR SECONDARY SCHOOL IWA	Rural	25	20	45	45	35	80	49	40	89
	GOVERNMENT JUNIOR SECONDARY SCHOOL KABO	Rural	65	24	89	86	32	118	68	45	113

	GOVERNMENT JUNIOR SECONDARY SCHOOL KWAKA	Rural	41	27	68	52	40	92			0
	GOVERNMENT JUNIOR SECONDARY SCHOOL SHAKO	Rural	20	15	35	15	12	27	15	10	25
	GOVERNMENT JUNIOR SECONDARY SCHOOL SHANU	Rural	19	16	35	19	8	27	21	17	38
	GOVERNMENT JUNIOR SECONDARY SCHOOL TUNA	Rural	25	22	47	27	11	38	27	10	37
	GOVERNMENTJUNIOR SECONDARY SCHOOL	Rural	59	55	114	81	75	156			0
	JUNIOR SECONDARY SCHOOL BOYI SARKI	Rural	22	36	58	19	27	46			0
PAIKORO	ABUBAKAR DADA SECONDARY SCHOOL PAIKO	Urban	254	110	364	191	6	197	253	9	262
	DAY SECONDARY SCHOOL ADUNU	Rural	126	95	221	82	71	153	56	72	128
	DAY SECONDARY SCHOOL BAIDNA	Rural	89	31	120	50	29	79	44	33	77
	DAY SECONDARY SCHOOL GWAM	Rural	44	43	87	33	17	50	39	26	65
	DAY SECONDARY SCHOOL ISHAU	Rural	60	53	113	28	22	50	33	20	53
	DAY SECONDARY SCHOOL KAFFIN KORO	Rural	340	39	379	222	60	282	103	32	135
	DAY SECONDARY SCHOOL KWAKUTI	Rural	106	37	143	102	42	144	108	65	173
	DAY SECONDARY SCHOOL NIKUCHI	Rural	619	341	960	91	56	147	70	29	99
	GOVERNEMENT DAY SECONDARY SCHOOL AMALE	Rural	20	5	25	26	8	34	19	11	30
	GOVERNMENT DAY SECONDARY SCHOOL FARIN DOKI	Rural	80	41	121	70	25	95	84	40	124
	GOVERNMENT DAY SECONDARY SCHOOL TATIKO	Rural	140	135	275	72	55	127	65	30	95
	JUNIOR SECONDARY SCHOOL GABADNA PAIKO	Rural	22	3	25	13	4	17	10	4	14
	JUNIOR SECONDARY SCHOOL JABO-JERE PAIKO	Rural	53	56	109	29	6	35	24	19	43
	JUNIOR SECONDARY SCHOOL PAGGO	Rural	56	49	105	32	18	50	24	26	50
	JUNIOR SECONDARY SCHOOL BUGO	Rural	25	15	40	7	3	10	12	7	19
	JUNIOR SECONDARY SCHOOL KARBWA SHAKA	Rural	24	12	36	23	10	33	21	9	30
	JUNIOR SECONDARY SCHOOL KURCHI	Rural	52	20	72	19	14	33	32	11	43
	MARTIN SANDA GIRLS SECONDARY SCHOOL PAIKO	Rural	0	115	115	0	119	119	0	101	101
	WOMEN DAY COLLEGE PAIKO	Urban	0	51	51	0	100	100	0	102	102
SULEJA	AWWAL IBRAHIM JUNIOR SECONDARY SCHOOL	Urban	30	40	70	70	90	160	90	100	190
	COMMUNITY SECONDARY SCHOOL	Urban	101	87	188	176	165	341	210	198	408
	GIRLS DAY SECONDARY SCHOOL SULEJA	Urban	0	200	200	0	315	315	0	234	234
	GOVERNENT JUNIOR SECONDARY SCHOOL RAFIN SANYI	Urban	84	96	180	81	120	201	106	116	222
	GOVERNMENT DAY SECONDARY SCHOOL MADALLA	Urban	73	83	156	124	141	265	141	157	298
	GOVERNMENT DAY SECONDARY SCHOOL KWAMBA	Urban	207	321	528	180	210	390	205	403	608
	GOVERNMENT JUNIOR SECONDARY SCHOOL BAKIN IKU	Urban	80	235	315	138	192	330	110	160	270
	GOVERNMENT JUNIOR SECONDARY SCHOOL SHUAIBU NAIBI	Urban	248	170	418	141	140	281	193	170	363
	GOVERNMENT SECONDARY SCHOOL FIELD BASE	Urban	70	65	135	112	114	226	112	123	235

	HASSAN DALLATU JUNIOR SECONDARY SCHOOL	Urban	23	7	30	64	51	115	76	41	117
	IBRAHIM DODO MUSA JUNIOR SECONDARY SCHOOL	Urban	35	19	54	22	28	50	19	27	46
	JSS FIELD-BASE	Urban	70	65	135	113	114	227	112	123	235
	JSS GWAZUGU	Rural	48	50	98	57	65	122	65	68	133
	JSS KUCHIKO	Urban	42	33	75	50	30	80	47	34	81
	JSS KWANKWASHE	Rural	85	68	153	197	212	409	218	326	544
	JUNIOR SECONDARY SCHOOL CHAZA SULEJA	Rural	54	50	104	113	100	213	67	64	131
	JUNIOR SECONDARY SCHOOLL ANGUWAR GAYAN	Urban	133	120	253	151	140	291	153	136	289
	TOTAL		12184	9796	21980	11723	10355	22078	10717	10637	21354

APPENDIX G

PROPORTIONATE SAMPLE SIZE FROM THE EIGHT SELECTED SCHOOLS

S/N	Names of Schools	School Location	Male	Female	Total
1	Day Secondary School Kwakuti	Rural	24	14	38
2	Junior Secondary School Zumba	Rural	21	7	28
3	Junior Secondary School Kadna	Rural	13	5	18
4	Junior Secondary School Birgi	Rural	4	2	6
5	Zarumai Model School	Urban	42	34	76
6	Day Junior Secondary School Barkin Sale	Urban	40	34	74
7	Abubakar Dada Secondary School Paiko	Urban	57	2	59
8	Day Secondary School,Tum Tum Kuta	Urban	61	22	83
	Total		**262**	**120**	**382**