

**IMPACT OF COLLABORATIVE LEARNING STRATEGY ON  
ACADEMIC ACHIEVEMENT AND RETENTION OF SENIOR  
SECONDARY SCHOOL GEOGRAPHY STUDENTS IN BOSSO, LOCAL  
GOVERNMENT AREA, MINNA**

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**2016/1/55706BT**

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MINNA, NIGER STATE.**

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**PROJECT REPORT SUBMITTED IN PARTIAL FULFILMENT OF THE  
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## ABSTRACT

*This study investigated the impact of collaborative learning strategy on the academic achievement and retention of senior secondary school geography students in Bosso Local Government Area Minna, Niger State. The study adopted quasi-experimental pretest-posttest control group design. A total sample size of eighty-seven students participated in the study. Four research questions and four hypotheses guided the study. The instrument used for data collection was Geography Achievement Test (GAT) and Geography Retention Test (GRT) which comprises of 20 multiple questions with four options and one correct answer, two senior lecturers in educational technology and one Geography teacher from senior secondary school validated the content of the instrument. The reliability coefficient was calculated using Kuder Richardson (K-R21) with reliability coefficient of 0.72. For data analysis, the research questions were analyzed with mean and standard deviation. Four null hypotheses were tested at 0.05 significance using T-test. Findings of the study revealed that collaborative learning strategy has a higher positive effect on student's academic achievement and retention in geography than the conventional teaching method. Some recommendations were made based on the findings. For example, science teachers should spice up their methods of teaching by using collaborative learning in their lesson delivery since it enhances achievement and active participation.*

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## CHAPTER ONE

### 1.0

### INTRODUCTION

#### 1.1 Background to the Study

The word Science comes from the Latin word "Scientia" meaning "Knowledge", but in a broadest sense, Science is any systematic knowledge-based or prescriptive practice capable of resulting in prediction. In more contemporary terms, science is a system of acquiring knowledge based on the scientific processes or method in order to organize a body of knowledge gained through research. Science is a continuing effort to discover and increase knowledge through research. Scientists make observations, record measurable data related to their observations, and analyze the information at hand to construct theoretical explanations of the phenomenon involved. Scientific fields are broadly divided into natural sciences (the study of natural phenomena) and social sciences (the study of human behavior and society). However, in both these divisions, knowledge is obtained through observation and must be capable of being tested for its validity by other researchers working under similar conditions.

Wikipedia defines Technology as ("science of craft", from Greek τέχνη, techne, "art, skill, cunning of hand"; and -λογία, -logia is the sum of any techniques, skills, methods, and processes used in the production of goods or services or in the accomplishment of objectives, such as scientific investigation. Technology can be the knowledge of techniques, processes, and the like, or it can be embedded in machines to allow for operation without detailed knowledge of their workings.

The term geography was first coined by Eratosthenese, a Greek scholar (276-194BC). Geography (from Greek: γεωγραφία, geographia, literally "earth description") is a field of science devoted to the study of the lands, features, inhabitants, and phenomena of the Earth

and planets. The word geography has been derived from two Greek words "geo" (earth) and "graphos" (description). Geography is unique in bridging the social sciences (Human Geography) with the natural sciences (Physical Geography). Geography is simply defined as the description of the earth's surface. Geographers are people who study geography, and these geographers are so interested in the earth's physical features, such as mountains, deserts, rivers, and oceans. They are also interested in the way that people are affected by the natural world. Geography has to do with our everyday life. Geography is the study of place, and seeks to understand the ways in which humans influence their environment, and in turn explore the influence the environment has on humans.

In the field of geography there are many importance which include it helps young people make sense of a complex and dynamically changing world, explains where places are, how places and landscapes are formed, how people and their environment interact, and how a diverse range of economies, societies and environments are interconnected, builds students own experiences to investigate all scales, from the personal to the global, encourages questioning, investigation and critical thinking about issues affecting the world and people's lives, now and in future.

And there are lots of methods in teaching geography but by the cause of this work just a few will be mentioned which are lecture method, observation method, demonstration method, discussion method, field work method, project method, questioning method (Malusu & Wachira, 2008).

According to Nigerian Education Research and Development Council (NERDC,2007) geography is crucial for effective learning in the modern age of science and technology given its application in industries and many other careers, the minimum standard embodied in

geography education is designed to build confidence in students and enhanced ability to adapt to changing situations in scientific and technological oriented society.

Akpan (2008) affirmed that nations at the forefront of modern development are those that have invested enormous resources over considerable time in the establishment and nurturing of a stable well supported science and technology education. Therefore, there is the need for effective science and technology education of the learner. For this reason, Science Teachers Association of Nigeria (STAN) often holds workshops, seminars and conference for science teachers, geared towards improving the methods of teaching science subject (Geography) and making them interesting to the students. In learning geography effectively, it is recommended that students should be motivated and allowed in knowledge getting process of observing, exploring, organizing and interpreting knowledge with minimum direction and guidance. The above recommendation became necessary because a review of student's achievement and retention in senior secondary school certificate in geography showed a decline in performance of students both in internal and external examinations (Chukwuneke & Nwachukwu, 2005); (Ezeano, 2002 & Ajjagun, 2006).

Eniayeju (2010) carried out a research that students attribute their poor performance in science subjects (Geography inclusive) as a way science courses are taught. Balogun (2003) also observed that only lecture method is what is commonly used for teaching science in Nigeria. The method focuses on memorization and rote learning and does not equip students with the ability to derive deeper understanding of concept, ideas and principles.

Therefore, geography education can only be effective if it is student centered. This study is set to view that collaborative learning strategy could be an effective method to improve the intellectual ability of students. Collaborative learning is based on the view that knowledge is

a social construct. Collaborative or active learning is a methodology that transforms that traditional lecture or teacher focused classroom into students centered room. Collaborative learning can occur peer-to-peer or in large group. Peer learning or peer instruction is a type of collaborative learning that involves students working in pairs or small groups to discuss concepts or find solution to problems with instructor acting as a facilitator. It was designed based on the understanding that interactivity and collaboration in small groups provide strong solution that would have not been reached individually and encourages sharing of research for enhanced learning. Collaborative learning strategies are explicit approaches or procedures to guide the process of collaborative learning. Collaborative learning occurs when dyads or small groups have been engineered to share responsibility, authority, and learning outcomes. Collaborative learning strategies provide the frameworks and step-by-step processes to facilitate interdependence among group members, active participation, interactive dialogue, and co creation of academic products, all of which are hallmarks of collaborative learning. In essence, these strategies are the architecture or infrastructure to facilitate construction of knowledge among students. Like active learning strategies an underlying principle of collaborative learning strategies is meaningful student engagement.

Furthermore, the most advantage of collaborative learning is enhancement of learning through a decrease in anxiety arising from the exam and critical analysis of complex situations, collaborative, learning also promotes group work, more retention, encourages students to be engaged in the learning process and transfer of knowledge. In this method, emotionally and intellectually, supporting the students will lead to profound learning and retention of concepts. In order words, results by wigg, 2011 and Bloom (2009) showed that the use of collaborative learning improves the performance of students.

The teaching of geography should show how the environment and the earth is like by carrying out observation, how generalizations are built upon, how knowledge and concepts are developed.

National Policy on Education (2004), stated that the instructional strategies proposed to improve science teaching are those taking cognizance of students active participation in the teaching and learning process. The role of students personal in the construction of knowledge has been largely neglected in traditional method of teaching. There is therefore the need to have a paradigm, which recognizes the role of personal participation in the development of scientific knowledge. It is to this end that this study is being conducted to examine the impact of collaborative learning strategy on geography student's achievement and retention in Bosso Local Government Area of Minna Niger State. Also, the probable effects of gender were also investigated in the study.

## **1.2 Statement of Problem**

The performance of students in geography at the senior secondary school has always had a decline, and this decline in students' performance is as a result of the inability of teacher's to complete syllabus on time, the availability of instructional materials and resource room, the availability of qualified teachers. The NECO annual report 2019-2020 shows a great decline in the year 2019: 410,991 registered for geography and 394,563 sat for the exam giving a total percent of 3.53%, and in the year 2020: 25,178 registered only 22,262 sat for the exam with percent of 2.15%. Also, due to inappropriate method of teaching used in the instruction delivery. This constant decline has remained a source of concern to science educators. One of the major problems causing student's failure in Geography is lack of

activity-oriented teaching methods that can be used for teaching and learning. This problem led to the introduction of collaborative learning strategy into the classroom.

The use of collaborative learning strategy in higher education is not new and has been introduced as an educational tool that begets attention in regards to practices and students' participation in the teaching and learning process. The current study provides a literature review that focuses on the usefulness of collaborative learning strategy as a means of beginning the teaching in the classroom.

The above problem led to the student's achievement and retention through the use of collaborative learning strategy as a method of teaching and learning of Geography.

### **1.3 Aim and Objectives of the Study**

The aim of this study was to investigate the impact of collaborative learning strategy on academic achievement and retention of Geography students in senior secondary school Bosso L.G.A Minna. Specifically the study sought to:

1. Determine the impact of collaborative learning strategy on the academic achievement of Geography students in Bosso L.G.A.
2. Find out the gender related impact of collaborative learning strategy in the academic achievement of Geography students in Bosso L.G.A
3. Examine the impact of collaborative learning strategy in the retention of Geography students in Bosso L.G.A
4. Determine the gender related impact of collaborative learning strategy in the retention of Geography students in Bosso L.G.A

## **1.4 Research Questions**

The following research questions were formulated to guide this study:

1. What is the impact of using collaborative learning strategy on the mean academic achievement scores of Geography students in Bosso L.G.A?
2. What is the impact of using collaborative learning strategy on the mean academic achievement scores of male and female Geography students in Bosso L.G.A?
3. What is the impact of using collaborative learning strategy on the mean retention scores of Geography students in Bosso L.G.A?
4. What is the impact of using collaborative strategy on the mean retention scores of male and female Geography students in Bosso L.G.A?

## **1.5 Research Hypotheses**

The following research hypotheses were raised to guide this study:

**HO<sub>1</sub>:** There is no significant difference in the academic achievement scores of students taught Geography using collaborative strategy and those taught using lecture strategy.

**HO<sub>2</sub>:** There is no significant difference in the academic achievement scores of male and female students taught Geography using collaborative learning strategy.

**HO<sub>3</sub>:** There is no significant difference in the retention scores of students taught Geography using collaborative learning strategy and those taught using lecture strategy.

**HO<sub>4</sub>:** There is no significant difference in the retention scores of male and female students' taught Geography using collaborative learning strategy.

## **1.6 Significance of the Study**

The recognition of a more effective conceptualization of the inquiry method will be of immense benefit to the students, teachers, other researchers, educational administrators and the nation.

To the students, identification of a more effective study method (collaborative learning) will help the students to achieve high in geography which will make them to choose science courses in higher institution and also appreciate the things around them. It will also make the learners to participate actively in class and interact with their fellow students while in class.

The researcher hoped that this will be a paramount importance to geography teachers as this will help them create a conducive learning environment that is challenging stimulating and relevant to boost student's interest and motivation for example in promoting cohesiveness among students using small group collaborative learning.

Furthermore, the study will help curriculum planners to see the effects of collaborative learning on student since information are practical and physical to learners. It creates the knowledge of usefulness of collaboration and use of collaborative strategy as an effective and efficient method in teaching and learning.

To the nation, evidence of a better method of inquiry will enhance student academic achievement in Geography and increase the number of students who will go into the study of important science courses like medicine, pharmacy, nursing and agriculture. These course of study will promote the national development and also increase the number of scientifically skilled and literate citizens.



## **1.7 Scope of the Study**

This study is to be done in Niger State, using senior secondary school (SS2) Geography students. The scope of the study is limited to all SS2 students in selected senior secondary schools in Bosso Local Government Area of Niger State. The senior secondary two (SS2) students were chosen for the study because the topic is in syllabus of Geography. The content scope for the study is Renewable and Non-renewable Resources to determine learners' achievement (dependent variable) and retention, while Collaborative method (Independent Variable), male and female as the (moderating variable). This topic was selected due to the role it plays in the enhancing student's interest and understanding in Geography. The study lasted for four weeks.

## **1.8 Operational Definitions of Terms**

**Achievement:** Is simply the action of accomplishing something or a thing done successfully with effort, skill, and courage in Geography through collaborative learning strategy.

**Retention:** It is the ability of an individual to keep or continue possession of knowledge using collaborative learning strategy.

**Collaborative Learning:** Is an educational approach to teaching and learning that involves groups of learners working together to solve a problem, complete a task, or create a product.

**Gender:** simply means either two sexes (male and female), especially when considered with reference to social and cultural differences rather than biological ones.

**Teaching method:** It simply means principles and strategies used by teachers in the classroom to enable students learning.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

In this chapter an effort was made to review literatures for this study, relevant findings related to this research work. The focus was centered on the following sub-headings.

- Conceptual framework
- Theoretical framework
- Empirical studies

#### **2.1 Conceptual Framework**

##### **2.1.1 Concept of Science**

Science has been defined in different ways by different authors, Science was derived from the old French and Latin word "Scientia" from knowledge which in turn comes from socio "know" from the middle age, the enlighten science or scientia means any systematic recorded knowledge.

Science is a branch of knowledge or study dealing with a body of facts or truth systematically arranged and showing the operation of general laws. Burnie (2017) also defined science as the systematic study of anything that can be examined, tested, verified. Similarly science is an intellectual activity through which seeks to understand nature, (Abdullahi, 2011; & Abilu, 2015). It is a systematic enterprise that creates, builds and organizes knowledge in the form of testable explanations and predictions about the universe. Science involves more than the gaining of knowledge, it is the systematic and organized inquiry into the natural world and its

phenomena. Science has given us detailed insight how the world works around us. Science is problem solving and knowledge generated by science is powerful and reliable, it can be used to develop new technologies, treat diseases, and deal with many other problems. Mike Brotherton (2010) says that science can show us what has caused mass extinction and the point the way to preventing similar catastrophes in the future. Science saves lives. According to Owolabi (2004) also stated that science is an integral part of human activities. Science is used for humans to solve daily problems and to control the environment.

### **2.1.2 The Concept of Educational Technology**

The age we are in is the modern age which involves the use of science and technology. There have been a lot of changes in the life of humans which is traced to the various contributions of science and technology, science has expanded our knowledge in various ways and directions. Science is seen as a blessing to humanity. The contribution of science and technology has been experienced by all spheres including the educational sector. To have the knowledge of what educational technology is it is very important to define technology. The word "technology" is from two Greek words *techne* and *logos*. *Techne* means art, skill, craft, or the way, manner, or means by which a thing is gained. *Logos* means the collection of techniques, skills, methods and processes used in the accomplishment of objectives, such as scientific investigation. Aniah (2017) defines technology as the application of science to art. Technology is a new area in the educational sector and is known as Educational Technology. Educational Technology is comprised of two words 'Education and Technology'. To fully understand the word educational Technology it is important we know their definitions. The word Education is derived from a Latin word "Educatio" meaning breeding, bringing up or rearing from. Thus education is a systematic process through which a child or adult acquires

knowledge, experience, skills, and sound attitude in pursue of wholeness. The word Technology is taken from a Greek word 'Techniques' which means an art relating to the development of skills and craftsmanship. Technology implies the knowledge of forming, molding, and shaping of material object to produce a new material object for a common goal.

Educational Technology is a complex integrated process involving peoples, procedures, ideas, device and organizing problems and devising, implementing, evaluating and managing solution to the problems.

"Technology in Education" it refers to the use of modern tools and techniques like Ipads, smart phones, interactives whiteboards, laptops, desktops, projectors, internet, YouTube, Wi-Fi etc., but include efficient and enhanced learning management system, schematic of information distribution, effective teaching and management of students, feedback mechanisms and performance evaluation methodologies. (Aniah, 2017). The of technology in the field of education is fourfold: it is included as part of the curriculum, as an instructional delivery system, as a means of aiding instruction and as a tool to enhance the entire learning process. With the introduction of technology in education it has moved from passive to an interactive class and the method of delivery is much engaging. In the latter, education is geared towards creating curiosity in the minds of students. In either case the use of technology can help students understand and retain concept better (Raja, 2018).

Spector (2013) asserts that Educational Technology is the application of educational theories and practices as well as resent discoveries of science and technology to the process of education. Is the development, application and evaluation of systems, techniques and aids in the field of human learning. It can equally be seen as theory and practice of designing development, utilization management and evaluation of processes and resources for learning.

It is the application of scientific knowledge and the conditions of learning to improve the effectiveness and efficiency of teaching and learning. Different countries use different terms and synonyms as educational technology, such as Audio Visual Resources, Technology of Teaching, and Educational Equipment. Today, there are more roles of educational technology in teaching and learning which is of great importance due to the use of information and communication technologies.

### **2.1.3 The Place of Geography in the School Curriculum**

The Nigerian Educational sector has always undergo a series of change since the 1960's. These changes are visible in the introduction of the 6-3-3-4 system and the new 6-3-9 system of education, the National Council on Education, the Nigerian Educational Research and Development Council (NERDC, 2014) and the Universal Basic Education (UBE, 2016). The recent restructuring and the development of Geography curriculum both in Junior Secondary School and the Senior Secondary class are very significant part of these changes. The adoption of the new 6-3-9 system of education brought with it some provisions for Geography whose secondary school education ends at the first three years. Provision was made for students whose programme will continue for the next three years at the senior secondary schools, emphasis will be laid on the senior secondary school Geography curriculum (NERDC, 2014). The former curriculum was been limited to factual, examination-oriented approach, but today, there is greater emphasis on the educational and experiential implications for the students. In the past teachers are more concerned merely with turning out students who are loaded with the facts and terminologies in Geography. Today, the curriculum has changed, it has become a matter of investigation, inquiry and experiential. Emphasis is now placed on the relevance of Geography to life (UBE,2016). The

new objectives guiding the formulation of Geography curriculum are: Teaching of Geography should provide a vehicle for the child development, to help him/her acquire the art of using knowledge and to learn something about his/her cultural heritage. Provide necessary background to citizenship and to intimate the students into a particular mode of thought. Offers a unique means of furthering inquiry and high intellectual growth in students. To help man live, place himself in the world and to learn his true position and what his/her duties are, to equip the students to understand other people environment. Develop positive attitudes to race, culture, and other people environment and places.

#### **2.1.4 Methods of Teaching Geography**

There are virtually different methods in teaching of Geography but for the cause of this research just few of these methods are mentioned.

##### **Lecture method of teaching**

Lecture method is one of the oldest methods of teaching. It is a teaching and learning procedure by which the teacher seeks to create interest, to influence and stimulate his

Students, and to get them involved in learning by the use of verbal message (Mukwa &

Otieno, 1988). The students' activity is listening and taking notes (Malusu & Wachira, 2008).

There are two forms of lecture method: formal lecture where communication is only one way and the informal lecture where the communication is two way i.e. from the teacher to students and from students to the teacher. In Geography teaching, formal lecture is more appropriate because it provides the teacher with feedback from the students. Although this method is teacher centered, it is mainly used by Geography teachers when presenting factual

information or teaching a large class (Gitau, 2008). However, Thungu (2008) argues that the method limits the students' participation in the lesson and does not develop the students' power of reasoning. Alcorn (2010) justifies the use of lecture method in secondary schools under the following conditions: when presenting important materials not easily obtainable, when supplementing text book materials, when developing interest and appreciation, when summarizing important points after a unit study. As advocated by the Gestalt psychologists, facts and information are meaningful only when they are taken in relation to the whole concept being taught (Were, 2003). From the researchers experience as a Geography teacher, it has been realized that the teacher's personality contributes a lot to the success of lecture as a teaching method e.g. Manner of dressing, good diction, voice projection, correct pronunciation and proper intonation facial expressions and gestures are effective means of developing students enthusiasm as well as of making lecture method alive (Mukwa, 1988). He states that when using lecture, the teacher should consider the following aspects.

His personality as a teacher: the teacher should be competent, friendly and interesting.

Consideration of the students: the teacher should make arrangements to ensure that the students follow and understand the lecture e.g. provide hand-outs.

The teacher should plan and organize the main point of the lecture in a systematic and logical sequence.

The teacher must carefully use the language which students can understand and follow.

The teacher should use the lecture method alongside audio materials in order to enhance teaching effectiveness.

## **Discussion as a method of teaching**

According to Gitau (2008), he defines discussion method as the oral interaction between people which consists of asking questions and giving answers. He further says that the method involves active participation of students and giving feedback and therefore is an effective method of teaching. The Kenya Institute of Education puts one of the objectives of teaching Geography in secondary schools as “to state, interpret, analyse and use geographical principles and methods to solve problems of national development” (KIE, 2008).

The use of discussion method is suitable for meeting the objectives of Geography teaching because the method provides an effective means of developing skills and of utilizing facts and information i.e. students not only learn to communicate ideas, but also to dissect and evaluate them and find wider and more practical applications for them. As a result, better understanding is ensured making learning more meaningful and more lasting (Quist, 2005).

There are two types of discussion method: The expository oriented discussion and the inquiry oriented discussion (Ayoti & Patel, 1992). In expository oriented discussion, the teacher presents his objectives, explains the learning activity, demonstrates it and then invites questions from students before he concludes the teaching activity.

For example, when teaching about the topic “the Great Rift Valley”, the teacher can explain what the Rift Valley is, show the location of the Great Rift Valley and Then ask students to give their views on the importance of the Rift Valley to the people of Kenya. In groups the students will discuss, record their views and present before the whole class before the teacher give the summary of the importance of the Great Rift Valley. The second type of discussion is inquiry oriented discussion, the teacher states the objectives, arranges for the discussion to



take place and the whole activity is open ended. This type is not suitable for teaching Geography since in it there are no specific conclusions to be reached.

According to Awiti (2010), discussion method can be effective and successful when the following preparations are made by the teacher and the students: the students given adequate time to search for information on the topic; the teacher avails the documents or assists the students by suggesting sources of information; and the students to be organized in appropriate groups and choose group leaders to record the points raised during discussion. Ngaroga (2008) emphasizes that the teachers role during discussion should be that of a guide. The students are therefore given time to express their ideas and participate actively in the lesson. Discussion method is therefore appropriate for teaching when the topic requires flow of information and ideas from the teacher to students, from students to teacher or student to student.

### **Demonstration**

According to the Kenya secondary school Geography syllabus, demonstration is one of the suggested teaching methods to be used by teachers. The syllabus also states that Geography in secondary schools should enable the learner to acquire appropriate skills as a basis for technological and industrial development (KIE, 2008).

The acquisition of knowledge is possible through oral instruction like explanation while acquisition of skills can be through demonstration.

Thungu (2008) states that learning by observation is followed by doing; hence, drill and practice exercises are required to enable the students to eventually perform the activity on

their own as individuals or as a group. Topics in Geography like weather measurement and map work can be effectively taught if demonstration is used. Studies done by Mukwa and Otieno (1988) observed that the emphasis in demonstration is learning by observing and it should often be followed by doing. Omwoyo (2009) describes demonstration as a teaching method which combines telling, showing and doing for the benefit of the students. The above description of demonstration is supported by the Chinese saying students to be good observers, stimulates their thinking, and the formation of concepts and generalization. As Waka and Ngigi (2009) puts it, our students need to be taught using those teaching methods that will build confidence in them so that when they get to exam rooms, they can perform well. According to the researcher's experience, the use of demonstration requires thorough planning and rehearsal of the activity. This is because the method exposes the teacher to be assessed by the students and the success in demonstration clearly reveals the competence of the teacher.

### **Field work as a method of teaching**

Field work as a method of teaching has been defined as a science of selecting, observing, evaluating and reporting information in a specific area (Gitau, 2008). It involves the direct use of the environment as a source of physical information. It can be organized to cover the area around the school. Most secondary school teachers have had a misconception that field work is only effective when the study is taken to a far area. This misconception has made field work to be used only by a few schools and can only be used once or twice in the entire secondary school life of a student. The high costs involved when the students are to travel to distant places; the travelling risks that the students get exposed to; the time taken for the study trip which is considered by some teachers to be excessive in terms of the rewards it will

reap; and finally, a lot of administrative work which is not usually welcomed by teachers who are already busy with other commitments make field work unpopular. Ngau and Nyamweru (1986) present field trip as a very effective method of teaching in secondary schools. He notes that the method when correctly used involves the students during preparation stage through information gathering on the topic and preparation of the data collection instruments like questionnaire; during presentation stage through student involvement in data collection activities such as asking questions, collection of samples and recording of information; after the lesson through follow up activities such as report writing and presentation, display of collected items and doing a test.

The use of field work in teaching Geography in secondary schools therefore helps in the attainment of one of the objectives of teaching Geography in secondary schools which states that; “by the end of the course the learner should be able to apply field work techniques in studying Geography” (KIE, 2002). Topics or themes like coasts and Coastal features can effectively be taught using the fieldwork method of teaching.

### **Project as a method of teaching**

Studies done by Lardizabal (1978) defined project method as a unit of activity carried on by the learners in a natural and life-like manner and in a spirit of purpose to accomplish a definite, attractive and seemingly attainable goal. Nacino (1980) viewed project to be essentially a learning unit, designed and conducted by students under the guidance of the teacher. He further stated that the project goals are established by the students based on their own background experience and they are encouraged by the teacher to work through study activities towards the achievement of those goals. Malusu and Wachira (2008) defines project as the Corporate or individual study of a challenging situation in real life in its natural setting

with a view to reaching a positive and concrete achievement. The three definitions of project as a method of teaching reveal that: the topic chosen for study should be a real problem in the learners' environment that when solved, the students will see a positive change in their environment. For example, students may be taken to an area around the school compound which has been affected by soil erosion and then asked to work in groups to conserve that soil. When this is done the students will feel satisfied and appreciate their work.

The method emphasizes the involvement of the teacher as a guide. Hence the method is learner centered. Whitcombe and Tombs (2007) states that when project method is used well by the teacher it enables the students to initiate and pursue knowledge, learn and work at their own pace, develop the spirit of curiosity, enquiry and investigative approach to acquire knowledge and to provide opportunity for the learners to come into contact with the problems, challenges and opportunities in real life situation. The merits of project method mentioned above are in line with one of the general objectives of teaching Geography in secondary schools which states that the learner should demonstrate the acquisition of positive attitudes, values and skills for self-reliance (KIE, 2008).

Researchers at the UK's National Foundation for Educational Research carried out a study and found out that teachers who use project method such as gardening in their teaching improve the learners' readiness to learn and encourage learners to become more active in solving problems (Jan et al. 2008). The report commissioned by the Royal Horticultural Society (RHS) says that the use of projects such as school gardening should be used as a key teaching tool rather than as an extra-curricular activity because it encourages learners to be more active in solving problems of their environment (Kogola, 2010).

## **Questioning as a method of teaching**

Questioning is a method where by the teacher asks questions and the learners give the answers. Questioning method is one of the oldest methods of teaching although it still stands as one of the most effective methods of involving the learners in the learning process (Nacino, 1980). From the researcher's personal experience as a teacher, and backed by research findings it has been observed that this is the most commonly used method of teaching (Mullen, 2003; Kyalo et al., 2006; Sewe, 2006) and at the same time it is the mostly abused method of teaching (Morgan & Geong, 1972; Alebiosu, 2002; Ngaroga, 2008).

For example, teachers who are lazy and those who do not prepare well for their class will resort to questioning to pass time. Nacino (1980) observed that with the change in our educational goals, from mere acquisition of facts and information to development of reflective thinking and intelligent manipulation of materials, the method of questioning has become more challenging for the teacher. For this method to be effective and for the teacher to overcome the challenges such as students asking irrelevant questions, he/she must be clear with the purpose for which he/she is going to ask questions and this shows that the questions must be prepared in advance. Farson and Crichton (1996) summarize the purpose of questioning into five categories; for teaching; for drilling; for guidance and teaching and for evaluating. Eagly and Chaiken (1993) conveniently groups questions into two general types: factual questions involving mere recall of factual information and thought questions requiring effective thinking, application and intelligent manipulation of learned materials. KIE (2008) emphasis that Geography as a subject should help the learners to state, interpret, analyse and use geographical principles and methods to solve problems of natural environment. On this point it is implied that the Geography teacher should employ thought questioning in their

teaching if the students have to achieve the syllabus objectives. This fact reveals that Geography teachers mostly use factual questions during their teaching and therefore the students remain unprepared to handle thought questions in the exams. Ngaroga (1996) contributes to the effective use of questioning by stating the following steps to be followed by teachers: State the question, Pause to allow the student to think about the answer to the question. Call on the name of the student, Listen to the answer and Comment on the answer.

### **2.1.5 Concept of Collaborative Learning**

The idea of collaborative learning dates back to between 1950 and 1960 to that used by doctors to deal and communicate with medical students, where it was noted that the students who were working in groups had medical assessment and results better than those who were working alone which reflected the great success of this idea. The best way to understand the method of collaborative learning is with the definition of these concepts as viewed by Swan et al. (2006, p. 46):

Collaborative learning is a teaching strategy that includes a small group of learners working together in order to develop the educational experience to the maximum extent possible.

Collaborative learning is defined as the work of individuals as members of groups, and each student of the group is linked to mental, emotional, and behavioural functions to achieve the objectives of the community and systems whose clear objectives help learners in the decision-making process and increase the sense of community.

Collaborative learning stands on the idea that learning is a naturally social act in which learners talk amongst them, and among the talk the learning occurs.

Collaborative learning is “a case, where such a case includes the following main aspects: first, two or more students learn or try to learn something together; second, ‘two or more’

may be explained as a pair, a small group (3-5 subjects) or a class (20-30 subjects); third, 'learn something' may be explained as follow a course or perform learning activities such as problem solving. Finally, 'together 'may be explained as many forms of interaction which may be face-to-face or computer mediated”.

Arguably collaborative learning aims to support the most effective teaching possible for the greatest number of students. Laal and Laal (2012, p. 492-493) pointed out that there are five basic elements in a collaborative learning environment:

Collaborative learning obviously perceives positive correlation; members in the work group are committed to depend on one another to gain the goal. And if any member fails to perform their task or responsibility, all members in the group suffers the consequences. This means the teacher must plant in the hearts of the learners the importance of collaborative teaching to build a collaborative learning environment.

Great communication and interaction: developing effective communication skills to interact with others contributes to an exchange of information and ideas through various channels to achieve the goals. Furthermore, successful communication depends on several factors such as the interaction between the teacher and the learner and the means of delivery in addition to the effects of the surrounding environment.

Individual accountability and personal responsibility; each student in the team is responsible for performing their task and reaching a high level of mastery.

Social skills: understanding behavior of each student is imperative to succeed.

There are a set of social skills learners should have such as confidence, calm, decision making, empathy, smiles, and communication.

Group self-evaluating: in order to improve the teaching and learning process and development, this should focus on the importance of a teacher competency standard in educational process and student assessment such as philosophy of education goals, defining curriculum content and textbooks under consideration, identifying objectives and analysing their content, and knowledge of their learning styles.

On the other hand, many previous studies and literature confirms the significance of effective participation and collaboration by students in supporting the effectiveness of the learning process. The evaluation of collaboration needs a radical rethinking of approaches and methodologies. In this context Swan et al. (2006, p. 46-47) pointed to three main issues which are involved in the assessment process:

The variety and kinds of goals for collaborative learning: these include distinguishing between the teacher who built the learning goals for his students on a collaborative basis, and between the teacher who built it on a competitive basis, or individually. In addition, collaborative learning should distinguish between students who work in the form of learning groups, or conventionally, and among the students who work in the form of cooperative learning groups. Furthermore, collaborative learning should distinguish between each element of the basic elements of cooperative learning that have been implemented in the successful image.

Arguably, even with these different groups, the same kind of evaluation will not be suitable, because learning goals differ from implementation to implementation, for instance, as Swan et al. (2006, p. 46-47) stated and distinguish between structured and emergent collaboration schemes. In the latter sorts of collaboration activities, assessment must also emerge. What is consistent across the varieties of online collaboration is that collaborative learning will be



more successful when it is valued, and that any such assessment should begin with a very specific understanding of desired learning. And in some collaboration activities, learning to collaborate is seen as an important part of what is to be learned; in others, it is merely a means to an end. In some collaborative activities, collaboration is focused on producing a group project, in others it is designed to improve the quality of individual work.

In conclusion, particular requirements for collaboration, containing detailed evaluation concentrated on crucial collaborative processes, will assist students achieve the desired aims.

Other issues refer to the complication of evaluating individual and group behaviors, where collaborative learning represents a complicated activity and to support collaboration, individual and group aspects must be evaluated.

This means the main building block of successful collaborative learning is integrated between the objectives of collaborative learning on the one hand and the goals of the learners on the other hand. However, to ensure the continued success of a collaborative learning strategy, it should succeed on an individual level.

An example of this type of evaluation according to Swan et al. (2006, p. 47) is: using summative testing is to give each student a grade based on some combination of their test score and the average score for their group. Another frequently used scheme is to give a common assessment for a group project and have group members rate their peers' contributions which are then averaged for individual grades. Unfortunately, these kinds of grading protocols are not often seen in online courses where the common approach is to assess either individual effort e.g., (online discussion participation) or group products (collaborative projects).

Collaboration on assessment itself: assessment for learning achieves and its effect becomes necessary when the practice is rooted in spirit and the heart of the teaching and learning process. Thus, the teacher uses a package of tools aimed at providing assistance through the presentation of aspects and activities of the collaborative learning plans to find the desired interest such as rebound, questions design and comment trapped correction.

Actually, collaborative learning can be a defined teaching technique, which is invested in the learning process, and can enable more than one learner (a group of three to five people, a class of twenty to thirty students, a community of hundreds or thousands of people, or even millions of people) to learn something related to studying course material, following a course, problem solving (or other learning activities) or even learning from lifetime work practice together (including several classes of communication, synchronous or non-synchronous, traditional (face to face), common in time or not, computer mediated, common effort or separately (Dillenbourg, 1999).

Moreover, collaborative learning requires working together towards a joint aim.

This type of learning is also known as collective learning, cooperative learning, peer learning, learning communities, team learning, collaborative learning, or peer teaching.

However, collaboration is more than cooperation. Collaboration means the whole process of learning, which consists of students teaching the teacher, students teaching one another and the teacher teaching the students. More significantly, it also means that students have a responsibility towards another learner in addition to themselves, such that achieving collaborative learning method goals involves students assisting each other to learn and understand (Dooly 2008a).

Interaction is the key portion of the educational process and is a principal focus on education through online methods in order to facilitate continued educational communication. Garrison and Cleveland-Innes stated that the goal of the educational process, regardless of the method of education (online, traditional, or a blended version), is to make the educational process effective, accomplishing specific learning results.

However, interaction must be more systematic and structured (Garrison and Cleveland-Innes 2005). Furthermore, in the collaborative classroom, it is primarily through the interactions and relationships between learners that knowledge is created. Thus, in order to be successful, this learning process needs to pay attention to developing a sense of community among the learners. Online learning includes activities planned to make a social environment that represents support for collaborative learning. Throughout the execution stage, the teachers nurture and encourage a sense of community among learners.

Garrison and Cleveland-Innes (2005) classified the interaction into the following types: learner–learner, learner–teacher and learner–content.

#### **2.1.6 Academic Achievement in Geography**

According to Pandey (2008), academic achievement is the performance of the students in the subjects they study in the school. It is directly related to students' growth and development of knowledge in educational situation where teaching and learning take place. To Usman (2000), academic achievement is the measure of students' learning acquisition of certain skills at the end of teaching and learning activities. As observed by Devis and Mayuri (2003), academic achievement is excellence in all academic disciplines, in classes as well as extracurricular activities. It includes excellence in sporting, behavior, confidence, communication skills, assertiveness, arts, culture and the like. An academic achievement is

something one does or achieves at school, college or university in class. As noted by Lassiter (2005) Academic achievement or academic performance is the outcome of education. Academic achievement is the extent to which a student, teacher or institution has achieved their educational goals (Tomporowski, Davis, Miller & Naglieri; 2008). As defined by Von, Hell, Benedict and Thomas, (2011) academic achievement is something one does or achieves at school, college or university in class, in a laboratory, library or fieldwork. An academic achievement, such as graduating 1st in one's class, is sometimes a purely quantitative matter, while having the findings of lengthy, comprehensive research published by a recognized journal is also a notable academic achievement. Being named a head of a particular department at a university is both a professional and an academic achievement. Academic achievement has become an index of child's future in this highly competitive world. Academic achievement has been one of the most important goals of the educational processes. Academic achievement is a key mechanism through which adolescents learn about their talents, abilities and competencies which are important part of developing career aspirations (Gagne, 2007). Crow and Crow (1969) defined academic achievement as the extent to which a learner is profiting from instructions in a given area of learning, that is to say that achievement reflected by the extent to which skill or knowledge has been impacted to him. Nwachukwu (2004) defined academic achievement as the actual accomplishment or proficiency one has achieved in an academic area as opposed to one's potentials especially at school, college or university. Lansu and Cillessen (2012) argued that the urge to achieve varies from one individual to the other. In line with the above assertions, Annie, Howard and Mildred (2006) reported that academic achievement is commonly measured by examinations or continuous assessment, but there is no general agreement on how it is best tested or which aspects are most important. Making a critical analysis of the factors influencing academic

achievement, Pandey (2008) confirmed that academic achievement can be influenced by some related factors like environment, culture, health, opportunities, exposure, training, motivation, methods of teaching, school location, physical activities, nutrition, individual differences, parents' academic status, to mention but a few. Similarly, Obeka (1998) carried out a study to determine the effect of practical work on students' academic achievement in environmental education concepts of senior secondary school Geography and found out that Geography students exposed to practical work significantly improved in their academic achievement.

### **2.1.7 Retention of the Concept Geography**

The sole purpose of teaching and learning some concept in Geography, in making use of different teaching methods and using resource materials is to establish a behavioral objective and make learning more meaningful. Meaningful learning is a product of retention.

Retention is explained as the process an individual keep and remembers things and experiences learnt. Incoming information provides the index that maybe consulted so that retention takes place without an elaborate search in the memory lane. The level of retention is determined by the type of teaching material used. In teaching and learning concept of Geography, different senses are applied. One of the biggest problems to overcome by students is the problem of retrieving what they have learned in school during examination period. Retention is the ability to remember things, task or what is learnt previously. Bichi (2012) sees retention as the ability to retain and later recall information or knowledge gained after learning. Suleiman (2011) sees retention as the ability to remember what one has learned in the past. For this to happen, three stages of human behaviour need to be considered. There must be an intervening period when the initial learning took place and the

time the information is needed and the final reproduction of the initial learned materials or experience. For retention to take place, there must be meaningful learning. Blair, Jones and Simon (2008) state that anything that aid learning in school will eventually improve retention. If what is learnt in the classroom is retained over a long period of time, student achievement in test and examination will be higher. The achievement of students in geography test and examination will depend on the level of retention of student on geographical concepts. Without studying adequately using the right technique, knowledge cannot be retained and hence, higher achievement of students cannot be a reality.

It has become worrisome that despite the number of experienced and qualified teachers in our secondary schools, the academic performances in internal and external examinations are not encouraging. Bindowo (2017) reveals that the recent poor enrolment and poor performance of students in geography in school certificate examination, has also affected students who have the desire to study science related courses. This problem ranges from poor motivation of students to study and inability of teachers to train geography students' basic skill needed in studying basic concepts in geography. With collaborative learning strategy content can be retained and hence their retention ability will surely improve.

In recent years studies in Education have been focused on structural and instructional strategies or methods. Akale & Usman (2013); Eniayeju (2011), carefully selected and skillful use of teaching aids make facts and information better retained and makes learning meaningful and interesting.

## **2.2 Theoretical Framework**

### **2.2.1 Constructivist Theory**

Collaborative learning depends on constructivist theory, which position that knowledge is built and translated through students. The learning process must be realized as something learned through activation of the existing cognitive structures or by building new cognitive structures that adapt to new input. Instead of passively acquiring knowledge, learning takes place between all the students and teachers in the process.

Furthermore, collaborative learning is described from different angles: social presence, motivational forces, cognitive presence and community of inquiry (Lowyck and Pöysä 2001). Thus, the students at Qatar University need tools that enable them to take charge of the learning process itself rather than following the traditional methods used in schools and colleges. In addition, the students need projects and workshops that aim to encourage and develop their skills through courses in different fields, which support collaborative learning. For instance, the mixture of e-learning practices that have been developed, as well as the most recent theories and approaches, support the effectiveness and success of the teaching-learning process and ideologies (Anderson, 2008). In a blended learning situation, there will be a combination of face-to-face instruction with computer-mediated teaching to offer a comprehensible learning solution. As part of the preparation of a knowledge-based economy and organizational learning, theories such as community, adaptive, and scaffolding learning might include multimedia training CDs, extra learning content and online conversation (including debate and live broadcasting) in order to expand and develop teaching and learning in light of the educational and pedagogical process as an entire integrated system (Tsai, 2011). According to active learning theory, learning is any educational and

pedagogical plan that connects students to the learning and teaching process (Alzaghoul 2011; Moore et al. 2011; Pange & Pange 2011).

### **2.3 Empirical Study**

Being one of the most extensively researched educational innovations of all time, and one of the evidence-based instructional practices, cooperative learning has proved to have a positive influence on student learning and has gained in popularity and is now occupying an increasingly prominent position in the higher education classroom (Davidson, Major, & Michaelsen, 2014). Definition of collaborative learning varies as different scholars have different versions (Cohen, 1994; Sharan & Sharan, 1987; Johnson, Johnson, & Holubec, 1993).

But in general, it involves having students work in small groups or teams to help one another learn academic material (Slavin, 1989). It's a teaching strategy which aims at learning through group activities so that members at different levels can maximize their learning.

According to Johnson and Johnson (2009, 2014), collaborative learning has its theoretical roots in social interdependence theory, which can be traced from Kurt Koffka, through Kurt Lewin, to Morton Deutsch and then modified and extended by David Johnson and Roger Johnson, with the basic premise being "the type of interdependence structured in a situation determines how individual interact with each other, and this in turn largely determines outcomes". Other scholars have also made their contributions to collaborative learning (Sharan & Sharan, 1989; Kagan, 1989, 2014; Slavin, 2010). Superiority of collaborative learning compared to traditional instruction is revealed in meta-analyses presented by many researchers (Johnson, Johnson, & Stanne, 2000; Kagan, 2014).



Collaborative learning can be implemented by structuring teaching assignments collaboratively but a prerequisite to that is the existence of collaborative groups. As learning activities are conducted in the form of collaborative groups, how to set up collaborative groups effectively, what types of groups to choose are crucial to a dynamic collaborative environment. There are basically three types of collaborative learning groups which can be used interchangeably or together in practice, namely informal collaborative learning groups, formal collaborative learning groups and collaborative base groups. While the former two types highlight temporary groups lasting for only a short period from a few minutes to one class session to several weeks, collaborative base groups however are long-term heterogeneous collaborative learning groups with stable membership, which last from one to several years and provide the long-term, caring peer relationships necessary to make academic progress (Johnson & Johnson, 2014).

Some may take base groups as dividing the class into heterogeneous groups, but not all groups are collaborative. There is evidence that group membership in and of itself is not sufficient to produce higher achievement and productivity, positive interdependence is also required (Johnson & Johnson, 2014). Positive interdependence exists when there is a positive correlation among individuals' goal attainments. Individuals perceive that they can attain their goals if and only if the other individuals with whom they are collaboratively linked attain their goals (Johnson, 2009). Positive interdependence can be fostered through a combination of goals, tasks, resources, roles and rewards.

## **2.4 Summary of the Literature Reviewed**

The literature reviewed, revealed the concept of science and educational technology. The place of Geography in the curriculum, various methods of teaching Geography, concept of Collaborative learning strategy, academic achievement in Geography and retention in the concept of Geography. The researcher identified theory relevant to the study which is constructivism theory; this theory helped in building up the theoretical framework of the study. The empirical study also revealed that constructivism teaching methods has a significant effect on academic achievement and retention.

## CHAPTER THREE

### 3.0

### METHODOLOGY

#### 3.1 Introduction

This chapter indicates the methodology used in carrying out this study. The chapter is arranged and presented under the following subheadings:- Research Design, Population of the Study, Sample and Sampling Technique, Research Instrument, Pilot Study, Validity of the Instrument, Reliability of the Instrument, Treatment, Geography Curriculum Used, Procedures for Data Collection, Data Analysis.

#### 3.2 Research Design

The study is Quasi Experimental in nature involving pre-test and posttest non-control equivalent groups designated as experimental and control. The experimental group was taught Renewable and Non-Renewable resources using Collaborative Strategy, while the control group was taught same topic using the normal Lecture Strategy for a period of 2 weeks. The two groups were post tested for achievement and retention respectively. The design is illustrated in figure 3.1

**Figure 3.1 Research Design Illustrations**

Group	Pretest	Treatment	Posttest
Experimental	O <sub>1</sub>	X <sub>1</sub>	O <sub>2</sub>
Control	O <sub>1</sub>	X <sub>0</sub>	O <sub>2</sub>

Where;

O<sub>1</sub>, O<sub>1</sub>- Pretest for Experiment and Control

O<sub>2</sub>, O<sub>2</sub> - Post test for Experiment and Control

X<sub>1</sub>- Treatment

X<sub>0</sub> - Control

### **3.3 Population of the Study**

The population of the study comprised the entire senior secondary two (SS2) Geography students in co-educational public secondary schools in Bosso Local Government Area in Niger State totaling 5,881. Target population of SS2 1,250 were used for the study.

### **3.4 Sample and Sampling Techniques**

A total number of Eighty seven (87) SS2 Geography students were captured in the intact classes used from two secondary schools in Bosso Local Government Area of Niger State, the Model secondary school FUTMINNA and Ahmadu Bahago secondary school has intact class arm A,B,C,D,E the researcher made use of simple random sampling technique was used to select two intact classes. From the two schools selected, one was randomly assigned to experimental group (collaborative) and the other control group (conventional). They were 37 students in the experimental group and 50 in the control group

**Table 3.2 Sample Size of the Study**

Name of school	Location of school	Type	Class	Arm	Male	Female	Total
Model secondary School FUTMINNA	Bosso	Mixed	SS2	A	20	17	37
Ahmadu Bahago Secondary School	Bosso	Mixed	SS2	C	30	20	50
Total					50	37	87

### 3.5.1 Research Instrument

The research instrument used for this work is an achievement and retention test prepared on the concept Renewable and Non-Renewable resources known as Geography Achievement Test (GAT) and Geography Retention Test (GRT) developed in line with the lesson taught using collaborative teaching strategy and conventional lecture method. The GAT and GRT consist of 20 multiple choice objective questions, each with four options with one correct option.

### 3.5.2 Validity of Instrument

Validity of an instrument means the ability of an instrument to measure what it intends to measure accurately. The research instrument and content was face validated by the following: Two senior lecturers in Educational Technology department at Federal University of Technology, Minna and, One Geography Teachers from Police Secondary School in Minna, Niger State while the content validity focused on the content or subject matter of the instrument.

### **3.5.3 Pilot Test**

A pilot test was carried out using the designed instrument in order to establish its reliability as well as the internal consistency of the instrument. The test-retest reliability approach was used to obtain data from 20 students. This set of students did not participate in the main study.

### **3.5.4 Reliability of Instrument**

The test-retest reliability was used to obtain data from 20 students. Simple random sampling technique was used to draw a sample of 20 students. These students were not part of the study. Students were pre-tested before treatment and after treatment and same instrument was used as posttest. The reliability index was found to be 0.72 (which showed an acceptable reliability), it was obtained using Kuder Richardson (K-R21) formula. thereby guaranteeing the reliability of the instrument to be used for data collection

### **3.5.5 Method of Data Collection**

Permission letter was taken to the various schools to seek their consent in order to make use of the schools to carry out the practical and it was granted to the researcher.

The researcher administered the test instruments in the various schools with the assistance of two teachers. The instruments were collected, marked and recorded as pre-test. Geography teachers from the various schools were used as research assistant to invigilate and collect test items at the end of the test.

The researcher grouped the class into small sub-groups to form a collaborative and interactive class for the experiment group, while the control group were taught same concept using the normal lecture method. After the treatment a post-test was given to both Experiment Group

(EG) and Control Group (CG) to obtain the achievement of each treatment. Two weeks later their retention test was given.

### **3.6 Method of Data Analysis**

The procedure for data analysis is determined by the type of data and the nature of the hypothesis to be tested. The student's t-test used in this study involved test data which brings out their differences and the hypotheses stated in null form. On the basis of these criteria, mean and standard deviation was used to answer the research questions and T-test significance between was used to test the hypothesis.

## CHAPTER FOUR

### DATA ANALYSIS, RESULTS AND DISCUSSION

#### 4.0 Introduction

This study focus on investigating the impact of collaborative learning strategy on the academic achievement and retention of Geography students in senior secondary school Bosso L.G.A of Niger State. This chapter is concerned with analyzing the data collected as it relates to the research questions and null hypotheses stated in Chapter One.

There were three forms of data collected from the students using Geography Achievement Test (GAT) and Retention Test (GRT) as follows:

1. Pretest data - This is to determine group equivalence of experimental and control groups.
2. Posttest data – This is to determine achievement of students after six weeks of treatment.
3. Post posttest – This data to determine retention level of the students based on the learned concept.

These forms of data are analyzed in the headings below and used to answer the research questions and their corresponding null hypotheses.

#### 4.1 Research Questions

##### 4.1.1 Research Question one:

What is the impact of using collaborative learning strategy on the mean academic achievement scores of Geography students in Bosso L.G.A?

The answer to research question one is presented in the table below:



**Table 4.1: Mean and Standard Deviation of Achievement Scores of Experimental and Control Groups**

Groups	N	Pretest		Posttest		Mean Diff
		$\bar{X}$	S.D	$\bar{X}$	S.D	
Experimental Group	37	12.81	2.96	13.48	0.10	
				2.91		
Control Group	50	7.44	1.93		0.22	
				7.66		
				2.99		

Table 4.1 above shows the mean and standard deviation of the experimental and control group. The post-test mean score of the experimental group taught using Collaborative learning strategy is 13.48 and standard deviation is 2.99, while the post-test mean score of the control group taught with conventional method of teaching is 7.66 and the standard deviation is 2.99. Which were both slightly higher than the respective pre-test mean scores (12.81, S.D=2.96 and 7.44, S.D=1.93). Both groups had an increased in the post-test, nonetheless, the difference in post-test mean score is 5.83 in favor of the experimental group. This implies that that the use of collaborative learning strategy improves students' achievement.

#### **4.1.2 Research Question two:**

What is the impact of using collaborative learning strategy on the mean academic achievement scores of male and female Geography students in Bosso L.G.A?

The answer to research question two is presented in the table below:

**Table 4.2: Mean and Standard Deviation of male and female students in Eexperimental group**

Groups	N	$\bar{X}$	S.D
Male	20	13.5	3.17
Female	17	13.47	2.67

Table 4.2 above shows the mean and standard deviation of the male and female students in the experimental group. The mean score of the male students taught is 13.50 and standard deviation is 3.17. While the mean score of the female students is 13.47 and the standard deviation is 2.67 with a degree of freedom of 37. The difference in mean scores is 0.1 in favor of the male students. This implies that that the use of collaborative learning strategy enhances both male and female students' achievement but the male students performed slightly better than the female students.

#### 4.1.3 Research Question Three:

What is the impact of using collaborative learning strategy on the mean retention scores of Geography students in Bosso L.G.A?

The answer to research question three is presented in the table below.

**Table 4.3: Mean and Standard Deviation of post-test and retention scores of the experimental group and control group**

Groups	N	Posttest		Mean Diff	Retention		Mean Diff
		$\bar{X}$	S.D		$\bar{X}$	S.D	
Experimental	37	13.59	2.91	5.93	16.43	2.83	5.71
Control	50	7.66	2.99		10.72	2.99	

Table 4.3 above shows the mean and standard deviation of post-test and the retention scores of the experimental group and the control group. The mean score of the experimental group at the post-test ( 13.59 , S.D=2.91) was lower than the mean retention score (16.43, S.D=2.83), while the mean score of the control group at the post-test (7.88, S.D=2.99) is also lower than the mean retention score (10.72, S.D – 2.99). This implies that students retained the concept taught nevertheless, the retention level of the experimental group was higher than the retention level of the control group.

#### 4.1.4 Research Question Four

What is the impact of using collaborative strategy on the mean retention scores of male and female Geography students in Bosso L.G.A?

The answer to research question four is presented in the table below.

**Table 4.4: Mean and Standard Deviation of post-test and retention scores of male and female students in the experimental group.**

Groups	N	Posttest		Retention		Mean Diff
		$\bar{X}$	S.D	$\bar{X}$	S.D	
Male	20	13.50	3.17	16.45	3.07	0.03
Females	17	13.47	2.67	16.47	2.67	0.02

Table 4.4 above shows the mean and standard deviation of post-test and the retention scores of the male and female students in the experimental group. The mean score of the male students at the post-test ( 13.50 , S.D= 3.17) is seen to be lower than the mean retention score (16.45, S.D= 3.07) also, the mean score of the female students at the post-test (13.47, S.D=2.67) is also lower than the mean retention score (16.47, .S.D = 2.67). Furthermore, there was a slight difference in the mean retention score of male and female students at the

retention level (0.02) in favor of the female students. This implies that both male and female students retained the concept taught, but the retention level of the female students was slightly higher than the retention level of the male students.

## 4.2. Testing of Null Hypotheses

### 4.2.1 Null Hypothesis One

**HO<sub>1</sub>**: There is no significant difference in the academic achievement scores of students taught Geography using collaborative strategy and those taught using lecture strategy.

To test **HO<sub>1</sub>** the post-test data of experimental and control groups were subjected to t-test statistics to determine if there is any significant difference between the achievement of the experimental group and the control groups. The summary of the analysis is shown in Table 4.5 below.

**Table 4.5: T-test Analysis of the Post-test Scores of the Experimental and Control Groups**

Group:	N	$\bar{X}$	S.D	DF	T-value	P.val	Remarks
Experimental	37	12.81	2.96	85	13.33	0.00	S
Control	50	7.44	1.93				

S = significance at  $P < 0.05$

From table 4.5 above, the mean score of the experimental group is 12.81 with a standard deviation of 5.51 while the control group had a mean score of 7.44 with a standard deviation of 1.93. The degree of freedom (Df) is 85, the t-value was found to be 13.33 while the p-value was 0.00 which is significant at  $P < 0.05$ . The results shows that there is a significant difference in the academic achievement scores of students taught Geography using collaborative strategy and those taught using lecture strategy, hence, the hypothesis one is rejected.

#### 4.2.2 Null Hypothesis Two

**HO<sub>2</sub>** : There is no significant difference in the academic achievement scores of students taught Geography using collaborative strategy and those taught using lecture strategy.

To test **HO<sub>2</sub>** the post-test data of the male and female students in the experimental group were subjected to t-test statistics to determine if there is any significant difference between the achievement of the male students and the female students.

The summary of the analysis is shown in Table 4.6 below.

**Table 4.6: T-test Analysis of the Post-test Scores of the Male and Female Students in the Experimental Group**

Group:	N	$\bar{X}$	S.D	DF	T-value	P.val	Remarks
Male	20	13.50	3.17	35	0.10	0.92	NS
Female	17	13.47	2.67				

NS = Not Significance at  $P < 0.05$

From table 4.6 above, the mean score of the male students is 13.50 with a standard deviation of 3.17, while the female students had a mean score of 13.47 with a standard deviation of 3.67. The degree of freedom (Df) is 35, the t-value was found to be 0.10 while the p-value was 0.92 which is not significant at  $P < 0.05$ . The results shows that there is no significant difference in the academic achievement scores of male and female students taught Geography using collaborative strategy, therefore, the hypothesis two is rejected.

#### 4.2.3 Null Hypothesis Three

**HO<sub>3</sub>** : There is no significant difference in the retention scores of students taught Geography using collaborative learning strategy and those taught using lecture strategy.

To test **HO<sub>3</sub>** the retention data of the students in the experimental group and control group were subjected to t-test statistics to determine if there is any significant difference between

the retention level of the students in the experimental group and the control group.

The summary of the analysis is shown in Table 4.7 below.

**Table 4.7: T-test Analysis of the Retention Scores of the Students in the Experimental and Control Group**

Group:	N	$\bar{X}$	S.D	DF	T-value	P.val	Remarks
Experiment	37	16.43	2.83				
				85	29.43	0.00	S
Control	50	10.72	2.99				

Significance at  $P < 0.05$

From table 4.7 above, the mean retention score of the students in the experimental group is 16.43 with a standard deviation of 2.83, while the control group had a mean retention score of 10.72 with a standard of 2.99. The degree of freedom (Df) is 85, the t-value was found to be 29.43 while the p-value was 0.00 which is significant at  $P < 0.05$ . This implies that there is a significant difference in the retention scores of students taught Geography using collaborative learning strategy and those taught using lecture strategy, therefore, the hypothesis three is rejected.

#### 4.2.3 Null Hypothesis Four

**HO<sub>4</sub>** : There is no significant difference in the retention scores of male and female students' taught Geography using collaborative learning strategy.

To test **HO<sub>4</sub>** the retention data of the male and female students in the experimental group were subjected to t-test statistics to determine if there is any significant difference between the retention level of the male and female students in the experimental group.

The summary of the analysis is shown in Table 4.8 below.

**Table 4.8: T-test Analysis of the Retention Scores of the Male and Female Students in the Experimental Group**

Group:	N	$\bar{X}$	S.D	DF	T-value	P.val	Remarks
Male	20	16.45	3.07				
				35	-0.09	0/93	NS
Female	17	16.47	2.67				

NS = Significance at  $P < 0.05$

From table 4.8 above, the mean retention score of the male students in the experimental group is 16.45 with a standard deviation of 3.07, while the mean retention score of the female group is 16.47 with a standard of 2.67. The degree of freedom (Df) is 35, the t-value was found to be -0.93 while the p-value was 0.95 which is significant at  $P < 0.05$ . The result indicates that there is a significant difference in the retention scores of male and female students taught Geography using collaborative learning strategy, hence, the hypothesis is rejected.

### **4.3 Discussion of Result**

Based on the results above, it is obvious from table 4.1 that students who were taught Geography using Collaborative learning strategy performed better than those taught using lecture method. This result is in agreement with the results of Davidson, Major & Michalsen (2014) who found in their study that collaborative learning, being one of the most extensively researched educational innovations of all time, and one of the evidence-based instructional practices, has proved to have a positive influence on student learning and has gained in popularity and is now occupying an increasingly prominent position in the higher education classroom. Also, from table 4.5, the null hypothesis one was rejected as there was a significant difference in the academic achievement scores of students taught Geography using collaborative strategy and those taught using lecture strategy.

Furthermore, results in table 4.2 above showed that the use of collaborative learning strategy enhances both male and female students' achievement but the male students performed slightly better than the female students however, the null hypothesis two was rejected as seen in table 4.6 due to the fact that there was no significant difference between the mean scores of the male and female students. Therefore, collaborative learning strategy is not gender sensitive. This result is in agreement with that of Johnson and Johnson (2014) who noted that there is evidence that group membership in and of itself is not sufficient to produce higher achievement and productivity, positive interdependence is also required, hence collaborative learning produces positive results for both male and female students.

Additionally, the results in Table 4.3 indicates that although all students retained the concept taught, the retention level of the experimental group was higher than the retention level of the control group. So, collaborative learning strategy enhances the retention level of students. The results in table 4.7 further indicated that there was a significant difference in the retention level of students in the experimental group and control group in favour of the experimental group.

Likewise, the results in table 4.4 showed that both male and female students retained the concept taught when taught with collaborative learning strategy. While the results in table 4.8 put out that the difference in the retention level of both male and female students was not significant. This further proves that collaborative learning approach is not gender sensitive.



#### **4.4 Summary of Findings**

From the data collected, analysed and discussed in this chapter, the findings can be summarized as follows:

1. It is particularly clear that students who were taught Geography concepts using collaborative learning strategy performed better than those who were taught using lecture method.
2. Students' retention score were higher when taught Geography concept using Collaborative learning strategy.
3. Although there was a slight difference between male and female student's achievement and retention scores, the difference was not significant, hence, collaborative learning strategy Is not gender sensitive.

## CHAPTER FIVE

### 5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

This study focused on investigating the impact of collaborative learning strategy on the academic achievement and retention of Geography students in senior secondary school Bosso L.G.A of Niger State. This chapter gives an over-view of the study and is presented under the following subheadings: Introduction, Summary, Conclusions, Recommendations, Contributions to Existing Knowledge, Limitations of the Study and Suggestions for Further Studies

#### 5.2 Summary

The research was carried out to investigate the impact of collaborative learning strategy on academic achievement and retention of Geography students in senior secondary school Bosso L.G.A of Minna. Two schools were selected as the sample of the study, one as experimental group and the other as control group. A total 87 students selected using simple random sampling method made up the sample for the study. The experimental group was taught using Collaborative learning strategy while the control group was taught using lecture method.

Four research questions and their corresponding null hypotheses were formulated and tested at 0.05 level of significance. A pre-test was conducted to determine their academic equivalence, post-test for academic achievements and post-post test to find out their retention ability. The data for the results were collected using a 20 multiple choice instrument titled Geography Achievement Test (GAT) and Geography Retention Test (GRT) respectively and analysed.

The following are the summary of the findings gotten

1. Collaborative learning strategy enhances Geography students' academic achievement.

2. Collaborative learning strategy notable improves Students' retention level.
3. Collaborative learning strategy improves both male and female students' achievement and retention ability.
4. Although there was a slight difference between male and female students' achievement and retention scores, the difference was not significant, hence, collaborative learning strategy is not gender sensitive.

### **5.3 Conclusions**

From the findings of the study it is clear that collaborative learning strategy when used in the teaching of Geography at Senior Secondary Schools will positively impact the student's academic achievements and their retention ability.

### **5.4 Recommendations**

Based on the findings arising from this study, the following recommendations are suggested:

1. Educational Administrators should encourage teachers to make use of collaborative learning strategy in teaching and learning of Geography in secondary schools.
2. Secondary school teachers should ensure to take extra refresher courses that will enlighten them the more on collaborative learning strategy.
3. The Ministry of education should organize workshops and seminars for teachers in order for them to be adequately enlighten on the concept of collaborative learning strategy.

### **5.5 Contributions to Knowledge**

The contribution to existing knowledge includes:

1. The use of collaborative learning strategy will improve students' academic performance, hence the need to incorporate it more into the classroom teaching and learning of Geography.
2. Students' classroom participation will also improve remarkably when teachers make use of collaborative learning strategy.
3. The use of collaborative learning strategy is suitable for both male and female students

### **5.6 Limitations of the Study**

This study has some limitations which include:

1. Language challenge with some of the students.
2. Limited time for the study.
3. The individual School time table and activities did not give enough room for extensive research work.

### **5.7 Suggestion for Further Studies**

The following suggestions is put forward by the researcher further studies:

1. The research work can also be carried out in other Local Government Areas of Niger State to find out if the same findings can be established.
2. The study can be conducted with junior secondary schools as this research work focused on senior secondary school geography students.
3. The research work can be carried out in other science subject.
4. Also, the research work can be conducted in other science subject in the North Central region as this study was on geography although conducted in the North Central region of Nigeria.

5. Finally, this research work can also be carried out in another region of Nigeria as this study was carried out in the North Central region of Nigeria.

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## APPENDIX A

### LESSON PLAN

NAME OF TEACHER	Bitrus Shekwonuzhinbo Charity
SCHOOL	Ahmadu Bahago Secondary School Minna
CLASS	SS2
DATE	14th, Feb 2023
DURATION	45 min
NUMBER OF STUDENTS	50
SUBJECT	Geography
GENDER	Mixed
TOPIC	Environmental Resources
REFERENCE BOOK	Secondary School Geography
ENTRY BEHAVIOUR	The students are already familiar with resources around them
BEHAVIOURAL OBJECTIVES	At the end of the lesson the students should be able to  (a) Define Environmental resources  (b) Mention the types of natural resources  (c) Distinguish between renewable and non-renewable resources  (d) List the advantage and disadvantage of renewable and non-renewable resources

Content Development	Teacher Activities	Student Activities	Skill Strategies
Introduction	The teacher ask the students question as follows: what are those natural things you can find around your environment	The students answer the teacher question, they also ask questions for better clarity to them.	Set induction
Step 1 Definition of Environmental Resources	The teacher defines the term Environmental resources are features of the environment provided by nature, which are used by man to achieve certain goals or satisfy human needs.	The students pay close attention	questioning
Step 2 Types of Natural Resources	The teacher mentions them (a) Renewable resources (b) Non-Renewable resources	The students listen with keen interest as the teacher explains and copy the note on the board while they write	Listening Questioning Explaining
Step 3 Explanation of the types of naturals and their advantage and disadvantage	The teacher explains the types of natural resources and also mention their advantage and disadvantage of natural resources	The students pay close attention as the teacher explains	Listening and questioning
Evaluation	The teacher ask the students the following questions after teaching  1. define environmental resources  2. list and explain the types of natural resources  3. mention the advantage and disadvantage of natural resources	The students respond to the questions actively	closure

## APPENDIX B

### Geography Achievement Test (GAT)

School: \_\_\_\_\_

Class: \_\_\_\_\_

Gender: \_\_\_\_\_

Date: \_\_\_\_\_

INSTRUCTION: Answer All Questions

1. \_\_\_\_\_ are features of the environment provided by nature, which are used by man to achieve certain goals or satisfy human needs. (a) Vegetation resources (b) Economic resources (c) Environmental resources (d) Social resources.
2. Natural resources occur in \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. (a) Sand, oil, and water (b) Air, water and land (c) Land, clay and fuel (d) None of the above
3. Natural resources are classified into \_\_\_\_\_. (a) 4 (b) 6 (c) 8 (d) 2
4. \_\_\_\_\_ can be finite or non-sustainable, so they can be used up and exhausted? (a) Renewable (b) Resources (c) Non-Renewable (d) All of the above.
5. \_\_\_\_\_ are generated through a continuous "flow of nature" as in the case of rivers and this guarantees a replacement. (a) Non-Renewable (b) Solar (c) Renewable (d) Energy
6. The following are the examples of Renewable resources **Except?** (a) Solar Energy (b) Water Vapor (c) Soil (d) Vegetation
7. When Non-Renewable resources are over-exploited or mismanaged this can lead to \_\_\_\_\_. (a) Pollution (b) Environmental Degradation (c) Construction (d) Disturbance
8. Man is regarded as \_\_\_\_\_. (a) Vessel (b) Solution (c) Resources (d) Visitor
9. Non-Renewable resources are not \_\_\_\_\_. (a) Available (b) Optional (c) Visible (d) Sustainable
10. Advantages of Renewable Resources include the following? (a) The resources are renewable and easily generated (b) They can cause natural disaster (c) They can be depleted (d) None of the above.
11. Renewable Resources are \_\_\_\_\_ everywhere (a) Consumed (b) Available (c) Resources (d) Energy
12. Another Advantage of Renewable Resources are (a) they can cause a natural disaster (b) provides nuclear energy (c) maintenance cost is cheap (d) All of the above.
13. Disadvantages of Renewable Resources include the following **Except?** (a) Easily generated (b) No optimum use of it (c) Affected by weather (d) Wastage
14. Advantages of Non-Renewable Resources include \_\_\_\_\_. (a) Availability of technology (b) Availability of fossil fuels and coal (c) Environmental use (d) A and B
15. Environmental pollution is the disadvantage of \_\_\_\_\_ resources (a) Water resources (b) Vegetation (c) Climate (d) Non-Renewable
16. \_\_\_\_\_ is the energy that comes from the sun (a) Panel Energy (b) Hydro-Energy (c) Solar Energy (d) A and B

17. ----- and ----- are released in large quantities when fossil fuel and coal are used (a) Carbondioxide and Climatic gas (b) Water and vapour (c) Carbon and Hydrogen (d) Resources
18. Non-Renewable resources are affected by ----- (a) Climate (b) Water (c) Weather (d) Crop
19. Natural resources are ----- and ----- (a) Renewable and Non-Renewable (b) Vegetation and Land (c) All of the above (d) Water and resources
20. Examples of non-renewable resources include the following **Except?** (a) Fossil fuel (b) Coal (c) Natural gas (d) Paper

## APPENDIX C

### MARKING / SCORING GUIDE FOR THE GEOGRAPHY ACHIEVEMENT TEST

One mark for each correct answer

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