AN ASSESSMENT OF METHODS OF TEACHING INTEGRATED COURSES TO INTEGRATED SCIENCE STUDENTS IN NIGERIAN INSTITUTIONS

BY

NJOKU FELICIA
EDU1803134

DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY.
FACULTY OF EDUCATION,
UNIVERSITY OF BENIN. BENIN CITY

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A PROJECT SUBMITTED TO THE DEPARTMENT OF CURRICULUM AND INSTRUCTIONAL TECHNOLOGY, FACULTY OF EDUCATION, UNIVERSITY OF BENIN, BENIN CITY IN PARTIAL FULFILLMENT OF THE REQUIREMENT OF THE AWARD OF THE BACHELOR OF SCIENCE (ED) DEGREE IN COMPUTER SCIENCE.

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CERTIFICATION

We undersigned, certify that this research work was carried out by **NJOKU FELICIA** in the Department of Curriculum and Instructional Technology. Faculty of Education, University of Benin. Benin City in partial fulfillment of the requirement of the award of the Bachelor of Science (Ed) degree in Computer Science.

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Dr. Mrs. A.H. Oyakhirome **Date**
Project Supervisor

_____ _____

Dr. Mrs. A.H. Oyakhirome **Date**
Project Co-ordinator

_____

Dr. Festus O. Idehen
Head of Department

_____

Date

DEDICATION

This study is dedicated to Almighty God for His Grace that sustained the researcher in the course of the programme.

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ABSTRACT

This study was designed to assess the methods of teaching integrated science courses to integrated science students in Nigerian Institutions. Three research questions was raised. The study was delimited to integrated science students in Nigerian institutions. The survey research design was used in conducting the study. The population of the study consisted of integrated science students across the four levels of Integrated Science Education course area in the department of CIT, University of Benin of which a sample size of 50 students were used for the study. The main instrument for the study was a self-structured questionnaire.

The validity of the instrument was established by giving it to the supervisor of the research work and two other experts in the field of this research study. The reliability of the instrument was established using the test-retest method of estimating reliability. After computation, the reliability yielded a Coefficient of 0.783. The questionnaire was distributed directly to the respondents by the researcher. After the collection and collation of the instrument, the data obtained were subjected to analysis using frequency counts and percentages. Results from the study showed among other things that, there is an average use of adequate methods of teaching integrated science education by the lecturers teaching integrated science courses and also there is an average use of the adequate and necessary instructional/teaching aids to guide teaching and learning.

Consequent upon the findings of this study, it was recommended that; state government through the state ministry of education should improve the knowledge of teachers on the methods of teaching that can enhance teaching and learning, government should ensure that they make provision for adequate learning facilities and environment in order for teachers to be able to adopt these methods effectively, the deans in the faculties where integrated science courses are being taught and the Head of Departments of Integrated science should ensure they monitor the teaching and learning in order to monitor the adoption and use of effective teaching methods, students should be enlightened properly on the techniques of the various teaching methods and how to adjust properly.

CHAPTER ONE

INTRODUCTION

Background of the Study

The teaching and learning of Integrated Science over the years have deteriorated and have become very discouraging. This has been as a result of the failure within the teaching-learning contexts to illustrate the connections between classrooms Integrated Science and the environment learners come from. It is important for science students to be well grounded in Integrated Science gradually and at at a level for them to be able to study the core science subjects (Biology, Chemistry, Physics etc). It is of this reason, that resulted to a call by the West African Examination Council (WAEC) for setting up a committee to look into Integrated Science as a subject (Olarewaju, 2015).

The committee recommended the following specific methods for teaching Integrated Science:

a) Use of discovery teaching tactics

b) The inclusion of problem solving activities

c) The involvement of students in open ended field or laboratory exercise (Olarewaju, 2014).

The efforts of the committee were expected to bring about a change in focus in the teaching and learning of the subject. For changes to be effectively implemented in Integrated Science education, it is necessary that base line information should be available on a number of important aspects. Such aspects include for example, how teachers view the subject, issues relating to attitudes towards the subject, Integrated Science anxiety and others. In Nigeria, while research has focused on a number of aspects related to Integrated Science Education, there has been little research focusing on the assessment of methods of teaching integrated courses to integrated science students in Nigerian institutions.

Hence, it is important to assess the methods of teaching integrated science courses to integrated science students, the strategies and the teaching methods utilized. Encouraging higher order learning skills and improving teaching and learning of Integrated Science requires discouraging students from resorting to unnecessary retention of facts, where the sole aim is to consciously recall information in the memory so as to use it later (Cooper,

Fromme, Gordon and Nicholasm, 2017). Therefore, emphasis and the aim when teaching integrated science should ensure that the learning environments of individuals encourage higher order learning skills which are created and made available. Also teachers should organize the teaching and learning context in such a way that students are more likely to follow higher order processes (Biggs, 2019). Teachers who are entrusted with the role of ensuring that appropriate environments are created for enhancing students higher order learning skills should endeavour they do this in synergy with their teaching strategies. This is paramount because educators have to find ways of injecting new knowledge into the system to bring about 3 improvement and to share that knowledge with future generations of teachers (Hiebert, Gallimore and Stigler, 2016). Such knowledge and information should help provide guidance on necessary changes that could be effected in order to address issues including the development of the learners cognitve abilities.

Furthermore, the methods of teaching integrated courses to integrated science students should be distinct in order to improve the quality of learning which an important aspect that improves the learners through

deeper approaches to study through the creation of a context involving good teaching, clear goals and some independence rather than to focus on discouraging surface approaches (Trigwell et al., 2017). Moreover, teaching methods is affected by the teacher's views of Integrated Science together with the teaching context which has an influential role and impact on instructional decisions (Salem, 2016). Psychologically, teacher behaviours in the classroom are shaped by internal principles based upon views on Integrated Science teaching. Inexperienced teachers are more likely to pass their past Integrated Science learning experiences to learners irrespective of the view they hold.

Statement of the Problem

The current situation of methods of teaching Integrated Science courses to integrated science students in Nigerian institutions is a concern to all including government and the society at large. Studies have shown that many students found Integrated Science to be difficult, boring and not interesting to them (Jacob 2015). Large class sizes, inadequate funding, insufficient resources, poor teaching skills and lack of support for teachers among other factors further limit the quality and determines the method

utilized by the teacher in the teaching of Integrated Science courses to integrated science students in Nigerian institutions (Okebukola, 2017).

Therefore, there is need to develop a realistic picture of the methods utilised in the teaching and learning of integrated science courses in general and Integrated Science in particular in Nigerian institutions and also to identify the factors that are limiting the quality of Integrated Science Education. Furthermore, there is a need to develop a reasonable recommendation and ideas for which the nation can strive towards improving Integrated Science teaching and learning within the existing resource limitations. From the range of evidence in the Integrated Science Education literature, it is very clear that Integrated Science Education in Nigeria is faced with numerous problems that need to be addressed so that the goal of equipping students to live effectively in our modern age of science and technology, as formulated in the Nigeria National Policy on Education (Federal Government of Nigeria) (FGN), 1981, 1998) will not become a day dream.

Furthermore, if appropriate steps are not taken to address these lingering barriers to the reform, the citizens will not be able to develop

scientific literacy necessary for coping in the modern scientific/and technological world. Efforts at developing scientifically literate citizens by improving the quality of science teaching and learning in schools is a laudable reform that should pre-occupy the mind of policy makers and all key stakeholders in science education in Nigeria. It is imperative for the issues involved to be examined empirically in the context of Integrated Science Education in Nigeria and the methods used in Nigerian institutions. Gaining the support of key stakeholders in exploring and revealing what is actually happening in Integrated Science teaching and learning in Nigerian institutions and formulating a realistic picture of science teaching and learning through which recommendations for filling the gaps between the actual and ideal could be developed, is necessary to improving the teaching methods of Integrated Science Education for Nigerian integrated science students in Nigerian institutions.

Therefore, this study seeks out to assess the methods of teaching integrated science courses to integrated science students in Nigerian Institutions.

Research Questions

The following research questions were raised to guide the study:

1. What are the methods of teaching Integrated Science in Tertiary institutions in Edo State?
2. What instructional materials are available for the teaching of Integrated science in tertiary institutions in Edo State?
3. ii. Which of the methods of teaching Integrated science do the students prefer for the teaching of Integrated science in tertiary institutions in Edo State?

Purpose of the Study

The purpose of the study was to assess the methods of teaching integrated courses to integrated science students in Nigerian institutions. Specifically, this study seeks to:

- Assess the methods of teaching Integrated Science courses to integrated science students in Nigerian institutions.
- Know the relationship between teacher's qualification/training and the methods of teaching Integrated science courses in Nigerian institutions.

- Assess the adequacy of the methods and techniques used by Integrated Science teachers in teaching integrated science students in Nigerian institutions.

Significance of the Study

In an effort to assess the teaching methods of Integrated Science courses to integrated science students in Nigerian institutions and to make the learning of the subject matter more attractive to students, this study makes the following contributions to knowledge and education. Firstly, this study will provides Integrated Science and other science educators, science curriculum planners and government with detailed information about an improvement of Integrated Science and other science teaching, methods in Nigerian institutions that are cost effective but efficient ways of improving the situation. It will also help in planning and formulating further policies for integrated science education in Nigeria.

Also, this study will envisage key stakeholders in integrated science education in revealing the actual and ideal pictures and gaining their support for recommendations to close gaps. This in essence informs them about the features of quality teaching methods in Integrated Science Education of

which through their support, adoption and implementation will lead to the improvement of these teaching methods through the recommendations for the study.

Also, this study will make the government further realize that the subject (Integrated Science) is not just a mere addition to the existing school curriculum, but one that is actual for the attainment of the much needed goals for scientific and technological development/advancement. Lastly, it will be a basis and guide for for further studies.

Scope and Delimitation of the Study

The scope of this study focuses on assessing the methods of teaching integrated science courses to integrated science students. This study is therefore delimited to integrated science students in Nigerian institutions.

Definition of Terms

Assessment: The action of assessing someone or something.

Methods: A particular procedure for accomplishing or approaching something, especially a systematic or established one.

Teaching: Teaching is the practice implemented by a teacher aimed at transmitting skills to a learner, a student, or any other audience in the context of an educational institution.

Courses: A unit of teaching that typically lasts one academic term, is led by one or more instructors, and has a fixed roster of students. A course usually covers an individual subject.

Institutions: An organization founded for a religious, educational, professional, or social purpose

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter will be discussed under the following subheadings:

- Concept of Teaching Methods
- Methods of Teaching Integrated Science Courses to Integrated Science Students
- Impact of Teaching Methods in Integrated Science Courses on the Educational Development of Integrated Science Students in Nigerian Institutions
- Factors affecting the Utilization of Teaching methods in Integrated Science Courses for Integrated Science Students in Nigerian Institutions
- Summary of Reviewed Literature

Concept of Teaching Methods

Kimweri (2016), defined teaching methods as a variety of ways of organizing the participants and the type of methods to be used to facilitate learning process which are determined by different factors such as number of students, age and the topic to be taught. Osokoye (2016) averted that

teaching methods or plan outlines the approach that a teacher intends to take in order to achieve the desirable objectives. Therefore teaching method involves the method used in teaching alligning and being in consonance with the learning objectives which is to lead the student through the course content.

The concept of teaching involves imparting information to the learner and the acquisition by the learner of specific knowledge, ideas, facts, skill and other relevant data condensed in the information for the learner's academic and mental development (Bryan, 20170. Teaching is an activity in which an individual learns from another. Teaching does not just involve engaging in activities, but it also involves paying attention to what is going on, to make diagnoses, and to change an individual's behaviour (Greyson & Lewis, 2019).

Sequeira (2015) posited teaching as a set of events, outside the learners which are designed to support internal process of learning. The teacher's role is therefore characterized by the traditional role which is teacher centered and modern role which has the teacher as a facilitator and is student centered.

The concept of teaching methods involves the types of teaching methods. The Teaching methods majorly consist of the following two; teacher-centered method and student-centered method. Another type of teaching method is teacher-student interactive method which is a fusion of both teacher centered method. Learner centered instruction refers to the students constructing their own understanding of content; develop a personal feelings that the knowledge is their own, Jacobson and kauchak (2019). The learner (Student) Centered method is a method with the advent of the concept of discovery learning, many scholars today widely adopt more supple student-centered methods to enhance active learning (Greitzer, 2017). Varieties of teachers today apply the student-centered approach to promote interest, analytical; research; critical thinking and enjoyment among students (Hesson & Shad, 2017).

Another method is the Question and answer method defined by Mtunda and Safuli (2017) as a method both for teaching and oral testing based on the use of questions to be answered by the student. Questioning techniques is one of the basic and successful ways of stimulating student

thinking and learning (Ndirangu, 2017). It is applicable to all teaching approaches and method.

Types of Teaching Methods

- Discussion Method: Discussion method is an important component for any teaching or learning situation which allows students to share their ideas (Ndirangu, 2017). It can be used at the beginning of a topic to ascertain students' pre-conceived notion of the subject matter or towards the end of a sub topic by presenting student with a new situation and asking them to explain in terms what they have just learned. Discussion group method entails a teaching and learning strategy through sharing and exchange of ideas, experience and opinion takes place, accompanied by active learning with all member of the group participating in it (Kimweri, 2015).
- Brainstorming Method: Brainstorming is a teaching method in which every pupil's response that applies to a given topic is acceptable (MIE, 2015). The strength of brain storming are that it promotes exploration, analysis and problem solving skills, develop the sense of cooperation and group cohesiveness in problem solving, encourages the generation of

creative ideas, promotes generation of initiative in searching solution to problems. The limitations of brainstorming are; it is time consuming if not planned and it is more useful to a limited number of learners and need thorough preparation.

- Demonstration Method: Demonstration is a practical display or exhibition of a process and services to show or point out clearly the fundamental principles or actions involved (Kimweri, 2015). Teaching by demonstration is a useful tool available to teacher and plays an important part in the teaching of skills. However for a demonstration to be effective it should immediately be followed with a practical session in order to reinforce procedures (Kimwere, 2015). This refers to the type of teaching method in which the teacher is the principal actor while the learners watch with the intention to act later. The teacher does whatever the learners are expected to do at the end of the lesson by showing them how to do it and explaining the stop-by-stop process to them (Ameh, Daniel & Akins, 2017). Also, Mundi (2016) described demonstration method as a display or an exhibition usually done by the teacher while the students watch with keen interests.

- Discovery Method is a technique or inquiry often called problem based learning and experiential learning. It requires providing guided task leveraging a variety of instructional techniques, students being able to explain own ideas while teacher checks the accuracy of the idea. Discovery learning takes place on problem solving situation as the learners draws on his own experience and previous knowledge. Students are able to interact with their environment by exploring and manipulating objects, materials, to find solutions and provide feedback on a given problem Tenenbaum (2017).
- Inquiry Method: This approach is more students centered as it focuses on asking questions using the learning content as means to develop information processing and problem solving skills. The teachers acts as the facilitator and prompts the student to ask meaningful questions. This method has four types which are: confirmation inquiry, structured inquiry, guided inquiry and open inquiry. Inquiry based leaning aims to develop students ability to analyze synthesize and evaluate information which is in line with Blooms Taxonomy.

- Teacher-Centered Methods: Teacher-centered methods of teaching is a one-way communication where by the teacher delivers the material orally while the learner listen or takes down notes (Kimweri, 2015). In this method, students simply obtain information from the teacher without building their engagement level with the subject being taught (Boud & Feletti, 2019). It does not apply practicality, and it is more theoretical and memorizing (Teo & Wong, 2019). Also in this method, students are not encouraged to learn real life problems based on applied knowledge. The teacher controls the transmission and sharing of knowledge, the lecturer may attempt to maximize the delivery of information while minimizing time and effort. As a result, both interest and understanding of students may get lost Zakaria, Chin & Daud (2017). The method is autocratic in form and allows very little or no room for active participation of the learners. These method includes the following:

- Lecture Method
- Presentation Method
- Seminar Method

- Teacher-Student Interactive Method: This teaching method applies the strategies used by both teacher-centered and student centered approaches. The subject information produced by the learners is remembered better than the same information presented to the learners by the lecturer (Jacob, 2017). The method encourages the student to search for relevant knowledge rather than the lecturer monopolizing the transmission of information to the learners. As such, research evidence on teaching approaches maintains that this teaching method is effective in improving students' academic performance (Damodharan and Rengarajan, 2019).

Characteristics of Good Teaching Methods

Onwugbu (2016) and Obiwusi (2017) summarized the characteristics of a good teaching method as follows:

- It should progress form simple activities to the more complex ones.
- It should possess the quality to arouse enthusiasm for active participation of students.
- It should lend itself to accommodate the individual differences.
- A good teaching method should help students like classroom activities with real life activities.

- It must be structured to satisfy the basic needs of the students.
- It should be able to put into action all five sense (hearing, seeing, feeling, testing ad touching) for effective retention of knowledge and transfer of skill acquired.
- It should be a method that always motivates for higher achievement without boredom.

Factors that Influence Choice of Teaching Methods

The choice of methods of teaching depends on different factors and these factors includes: knowledge of the teacher and flexibility (Bruner, 2015). In order to make an informed choice of teaching methods in the teaching and learning process, the teacher must know the teaching method available, the strength and weakness of each method, the purpose of each that determines how each method can be used in practice. Other considerations that are vital and important during choosing a method of teaching are the number of students to be taught, age, time an prior knowledge of the learner.

Factors that influence the choice and selection of methods of teaching includes:

- The method must be right for the learners
- The method must be also right to the teacher
- The method should be the best for the subject matter
- The strategy must be right for the resources available
- Time Allocated
- Concept of Student
- Academic Performance

Methods of Teaching Integrated Science Courses to Integrated Science Students

Methods of teaching integrated science courses is defined as a systematic pattern to be followed in the teaching and learning process to drive home a point (Aldrich, 2016). Whether it is formal or informal education, effective teaching methods make students to retain learned concepts. It is required that a teacher adopts realistic instructional strategies that will promote student's conceptual understanding, retention and achievement. The teaching method adopted by an integrated science teacher

in the teaching of integrated science courses should promote learning which is of topmost importance and has been shown to reflect on student's understanding of the subject. Therefore, there is the need to introduce, adopt and adapt the latest instructional techniques that are capable of sustaining the interest of the learners. Some of the methods of teaching Integrated Science courses to integrated science students involving the use of outdoor science educational activities includes;

- Field Trip/ Excursion Method
- Demonstration Method
- Project Method
- Process-Based Teaching Method
- Inquiry Approach Method
- Laboratory or Experimental Method
- Lecture Method
- Co-operative Learning
- Discussion Method
- Teacher exposition

Field Trip/Excursion Method

Field trips involve journey with the pupils to observe and investigate situations outside the classroom. Many of such expeditions might go no further than the school building or environment (Osahenkhoe, 2016). Within the school itself, the teacher may find illustrative examples for his or her students. In the immediate environs of the school, there may be available for examinations and observation of things such as different soils, flowers, a river etc. Popular field trip sites include zoos, nature centers, community agencies such as fire stations and hospitals, government agencies, local businesses, amusement parks, science museums, and factories. Field trips do not only provide alternative educational opportunities for children, but they also benefit the community if they include some type of community service (Pascal, 2017). Field trips also provide students the opportunity to take a break from their normal routine and experience more hands-on learning. Places like zoos and nature centers often have interactive displays that allow children to touch plants or animals.

Students who directly participate in a field experience generate a more positive attitude about the subject. Field trip is also defined by many

scholars as student experiences outside of the classroom at interactive locations designed for educational purposes (Greg, 2016). Field trips are most often done in three steps and these are:

- preparation
- activities and
- follow-up activity.

Preparation applies to both the student and the teacher. Teachers often take the time to learn about the destination and the subject before the trip. Activities that happen on the field trips often include lectures, tours, worksheets, videos, and demonstrations. Follow-up activities are generally discussions that occur in the classroom once the field trip is completed (Greg, 2017). Field trips may be planned for five purposes:

- To provide firsthand experience
- To stimulate interest and motivation in science
- To add relevance to learning and interrelationships
- To strengthen observation and perception skills
- To promote personal (social) development.

Field trips involve journey with the students to observe and investigate situations outside the classroom about science and technology concepts and themes as they occur in actual situations. Many of such expeditions might go no further than the school building or environment. Within the school itself, the teacher may find illustrative examples for his or her students. The students usually have firsthand experience in nature and technological settings. The experiences gained during field trips are long lasting and vivid (retention) Greg (2017). Some possible sites for field trip and related science and technology concepts are school farm/garden, playgrounds, mechanics workshop, blacksmith, electronics and electrical workshops and cyber café, streams, pounds and various industries.

Furthermore, it is important for the teacher to give the students opportunity to select any of the scientific and technological interest appealing to them for the field trip from which the teacher evaluates it and deems it sufficient for the course content. The teacher should visit the site for the field trip before the date of excursion and make necessary and adequate arrangements. The science and technology concepts to be learned should have relevance to the curriculum and the students should have

sufficient time to observe and ask questions. When the pupils return, the teacher should ask them to discuss and make a report of the trip (Greg, 2017).

Demonstration Method

The demonstration method involves the repetition of series of planned actions designed to illustrate certain phenomena (Joshua, 2016). The demonstration can be presented by the student or the teacher. Demonstration often occur when students have a hard time connecting theories to actual practice or when students are unable to understand the application of theories. Demonstration in science class involves carrying out science and technology activities to illustrate science and technological concepts or ideas.

Demonstration method refers to the type of teaching method in which the teacher is the principal actor while the learners watch with the intention to act later (Alfieri, 2017). Here, the teacher does whatever the learners are expected to do at the end of the lesson by showing them how to do it and explaining the step-by-step process to them, it is also described as a display or an exhibition usually done by the teacher while the students watch with keen interest. He further added that it involves showing how something works or the steps involved in the process.

Avantages of the Demonstration Method

- It saves time and facilitates material economy
- The method is an attention inducer and a powerful motivator in lesson delivery
- Students receive feedback immediately through their own products
- It gives a real-life situation of course of study as students acquire skills in real-life situations using tools and materials
- It helps to motivate students when carried out by skilled teachers and it is good in showing the appropriate ways of doing things

Teachers do not only demonstrate specific learning concepts within the classroom, they can also participate in demonstration classrooms to help improve their own teaching strategies, which may or may not be demonstrative in nature (Alfieri, 2017). Danjuma (2018) posited that the effects of demonstration classroom teachers include a change of perspective in relating to students, more reflection in the teacher's own classroom strategies, and more personal responsibility for student learning.

In carrying out the demonstration, the following should be noted:

- Purpose of the demonstration must be clear to all students

- All students should see every part of the demonstration
- Involve the students as much as possible
- Use simple and readily available apparatus and materials for demonstrations.
- Advantages of the Demonstration Method
- It is a powerful means of motivating learners and arresting attention when it is employed at the beginning of the lesson.
- It saves time.
- Materials are economized as the demonstration is done for a group of learners and not individual learners.
- It makes abstract concepts real.
- It aids learners' observational skills.

Despite the merits, it has a weakness which is that it does not allow learners to develop manipulative skills as the demonstration is usually done by the teacher. This method can be combined with field trip method. This is because some of the activities that take place in field trips are first demonstrated to the learners by the teachers or the resource persons in the course of explanation.

Project method

The project method is a method of teaching integrated science courses which involves project work, project approach, and project-based learning. It is one of the standard teaching methods and it is a sub-form of action-centered and student-directed learning and an enterprise in which children engage in practical problem solving for a certain period of time (Bryan, 2018). Bryan (2018) posited that projects focus on applying and not just imparting specific knowledge or skills but more rigorously than lecture, demonstration, or recitation, which aims at the enhancement of intrinsic motivation, independent thinking, self-esteem, and social responsibility. Victor (2016) also opined that proponents of the project method attempts to allow the student to solve problems with as little teacher direction as possible. The teacher is seen more as a facilitator than a delivery of knowledge and information.

Project method is a method that can be used by integrated science teachers when teaching integrated science courses to individualize instruction (Bryan, 2018). It is used to teach a central theme, idea or problem to be tackled. This theme could be given to individual student of group of

students. The students are encouraged to investigate, collect specimens or materials, analyze and construct things on their own. The teacher act as a guider in facilitating the student's learning. At the end of the investigation, the reports on the project are collected and discussed with the whole class. Steps necessary to be taken in Project Method includes taking definite and planned steps, mention of which are as follows:

Step One: The teacher provides a situation for the project to the students. Under this step, the teacher should create such conditions in which students can make various kinds of scientific inquiries from him. Usually, it is found that there is a spontaneous upsurge of such situations while at the same time, the teacher has to plan for the creation of such conditions. Students can spot out such problems at any place, i.e., laboratory, classroom etc.

Step Two: Once the students become interested in picking up and solving a problem, the teacher should provide them with a number of alternative suggestions out of which they can make a selection of suitable project in accordance with their mental abilities. To make choice of appropriate alternative, proper suggestion and advice should be provided to the students

by the teacher. While doing so, it is necessary for the teacher as well as the students to keep in mind the available facilities in the school.

Step Three: In the third step, proper planning relating to the project is made out. The teachers take certain steps by which students can be made to hold a lively discussion. For this purpose, the teacher can also arrange for an expert from another institutions or schools. Students should carry out all the efforts for chalking out a detailed strategy in accordance with which chosen project will be carried out. In this stage, the teacher should play an active role. It is only the teacher who can provide the students with suggestions on how to choose the most practical plan of action. At this stage, the teacher should also assign duties and responsibilities among the students and they should be informed about their area of functions.

While keeping interest and mental capabilities of the students, the teacher assigns work to the various students by which they can execute the project in reality. For proper execution of the project, it is necessary that all the students should be provided with equal opportunities. Teachers also provide the students with the authority by which they can sub-divide the responsibility provided to them. Such arrangements and conditions are

created by the teacher that all the students of the group can work wholeheartedly with a sole purpose of executing the project successfully. Through various sources, important information's are being collected by the students. For this purpose, they also visit various places and keep timely accounts of the project. Teachers provide students with proper guidance if any kind of difficulty get arise. In this process, students can acquire valuable theoretical understanding and practical application of various scientific ideas and facts in their life. It is the responsibility of both the teachers and students to review the success and failure of the project frequently. This step is taken to ensure that the set objectives for conducting project have been realized properly. Such conditions are created by the teacher where the students can assess their level of performance themselves. Some of the important aspects of execution step are discussions for improving the execution activities of the project and seeking changes in the procedure. For overall assessment, the project is being evaluated at the end, once it is fully executed to determine the achievement, difficulties, and lessons which are learned by students during execution of the project.

Furthermore, students should keep a complete record of the work performed by them during execution of the project. Every step taken by them should be recorded in a proper manner. They should note down the difficulties which they faced during their work properly. All the above-mentioned steps should be taken by the students while executing the project. Nature and kind of project should be selected by the students however, the teacher should provide them with proper guidance and directions.

Advantages of the Project Method

- Provision of various learning experiences through the sharing of individual and individual group experiences which would definitely be different from person to person or group to group.
- The emergence of inter-disciplinary studies as a project may contain materials from more than one subject area.
- Use of child-centered activities which ensures that the child's natural interests are fully taken care of during the teaching-learning process.
- Disadvantages of the Project Method
- It needs a lot of time and efforts to accomplish.
- It is very difficult to plan and execute if the class is large.

- It is easy to deviate from the objectives of the lesson.

Process-Based Teaching Method

Problem-based learning is a process that uses identified issues within a scenario to increase knowledge and understanding (Mason, 2016). Process-based approach lays emphasis on helping the students to develop process skills through practice or hands-on activities. These activities can take place inside the school classroom or outside. The teacher is to encourage the students to learn how to observe objects or events more closely as they use their senses to gather information about the objects or events (Mason, 2016). The teacher should make sure the information the students obtain are qualitative by describing what they have actually observed. An example of process-based learning is illustrated in the case of grouping (classification) and observation. For example, identifying similarities and differences of objects and events such as:

- Students identifying common weeds in the environment
- Students identifying diseases infesting crop materials in their environment

- Students identifying types of building and differentiating between each of the buildings in their environment.

Inquiry Approach

The inquiry approach is primarily a pedagogical method, developed during the discovery learning movement of the 1960s as a response to traditional forms of instruction where people were required to memorize information from instructional materials. This affords the students and the teachers the opportunity of observing things in their environment, discover knowledge and principles without being spoon-fed by the teacher (Maxwell, 2016). Inquiry method encourages divergent thinking, allows students to find out information by themselves and it generates students' enthusiasm at examining issues logically. Learners come indirectly with the materials or objects. There are two approaches: inductive discovery and deductive discovery.

Inductive discovery: This is investigative in nature and this could be open-ended in which the teacher provides the procedures and the learners use these to find out facts.

Deductive discovery: This is based on confirming certain information. It is verificatory in nature and it involves confirming or verifying a particular generalization. There is the provision of a suitable amount of background information and a well-structured procedure for the students to follow.

There are specific learning processes that people engage in during inquiry approach, these processes include:

- Creating questions of their own
- Obtaining supporting evidence to answer the question(s);
- Explaining the evidence collected
- Connecting the explanation to the knowledge obtained from the investigative process
- Creating an argument and justification for the explanation.

In the inquiry approach, the students are given the opportunity to carry out the search and discovery of facts about events and scientific and technological ideas. The pupils are made to observe carefully, identify the problem, explorations, hypothesizing, predicting, describing and conducting experiments, collecting data, organizing and analyzing data, reporting, making generalizations and so on. It develops attitudinal skills such as

objectivity, curiosity, open-mindedness, and perseverance. Inquiry entails practicing of attitudinal skill such as honesty, open-mindedness, and perseverance when carrying out science and technology tasks. Inquiry can be open-ended or close-ended. It could also be done in the classroom or outside the classroom.

Advantages of the Inquiry Method

- It enables learners to be actively involved as the method emphasizes learning through thinking.
- It facilitates the discovery of meaningful concepts, minimizes memorization and stresses the importance of experience in solving a problem or arriving at a logical conclusion.
- It motivates learners by providing them the opportunities to satisfy the need to talk and interact with their peers.

Disadvantages of the Inquiry Method

- It is time-consuming.
- It does not allow for the effective participation of weak and below average students.

Laboratory or Experimental Method

The laboratory method refers to the activities such as observation of processes, products or events carried out by a group of students or individual students (Stanley, 2017). Laboratory method can be used to practice skills or acquire skills such as interpreting and operating experiments. Experiments could be carried out to verify hypotheses, confirm the known and discover the unknown. It aids the development of manipulating skills, enhances realistic learning, it aids better retention, it develops competence in learners in learners by developing confidence and helps develop students' scientific attitudes, interest, and skills (Stanley, 2017). The method aids the learners to use their mental process such as observing, inferring, measuring and data analysis. The advantages of this method may not fully be realized because of lack of the facilities and equipment necessary for the effective use of this method.

Lecture Method

This method is the most commonly used mode by the teachers. This expects the students to quietly sit and listen to the talk about the subject matter. The teacher does all the talking while the students are passive, doing

little or no talking. The lecture is seldom used in secondary school classroom teaching-learning situations. Most of what happens in teaching situations with a class size of over 200 students in tertiary institutions is lecturing. This is an organized verbal presentation of a subject matter dominated by the teacher with little or no student involvement. The teacher is responsible for organizing, preparing and presenting the lecture while the students listen. The lecture method saves time and more topics are covered, but it is rote learning and most often students lose the essential parts of the lesson. The learners are passive and the class is boring and at the end does it not make room for the acquisition of scientific skills.

Advantages of the Lecture Method

- It allows the material to be clarified and presented to a large group in a short period of time.
- It gives teachers maximum control of the teaching in terms of the amount of interaction, type of substance presented and organization of material.
- The method promotes learners' oral and written expression.
- It also helps learners to cultivate the habit of listening attentively.

- Disadvantages of the Lecture Method
- It encourages one-way communication.
- It hardly takes care of individual differences.
- The teacher can present too much material leading to an unrealistic level of student understanding of the topic and causing information to be quickly forgotten.

Co-operative Learning

Co-operative learning is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a concept or subject (Billy, 2015). Each member of a team is responsible not only for learning what is taught but also for helping teammates learn, thus promoting academic achievement and cross-cultural understanding. However, the quality of achievement and other outcomes depend on the implementation of cooperative learning methods that are characterized by at least two essential elements which are positive interdependence and individual accountability. In a group task, each member is individually accountable for part of an outcome that cannot be completed unless the members work together in

other words, the group members are positively interdependent. Some co-operative learning methods include:

Group investigations: To emphasize higher order thinking skills and produce a group project;

Jigsaw: This is used with narrative material where each team member is responsible for learning a specific part of a topic, becoming the "expert" and then sharing their findings with the group.

Guided reading and other integrated cooperative reading strategies.

Discussion Method

Discussion simply means talking over topics from various points of view and the teacher's role is to act as moderator. Discussion in a science classroom should be differentiated from lecturing. This is because discussion implies that every student has background information that provides him with viewpoints. In the use of this method, there is an exchange of ideas between the teacher and the learner. Discussion method can be used to introduce a lesson thus motivating student's activities. It develops a positive interpersonal relationship and provides students with a sense of confidence through frequent exchange of ideas between the teacher and the students. It

enables the teacher to get a feedback on topics taught and learners are able to express themselves in relation to the understanding they have on a particular topic. However, it cannot be used often as it does not allow easy coverage of syllabus, and not all topics led themselves to discussion. As the discussion method must necessarily start with a question, the teacher must avoid vague questions and so requires a thorough knowledge of the topics under discussion.

Teacher Exposition

Teacher exposition is a teacher-centered technique used to present subject matter in an orderly and organized fashion. It is the most frequently used method by teachers. It is normally confused with the lecture method, which is extremely expository. Teacher exposition is not a lecture method. A good teacher exposition differs from a good lecture in that the former makes specific provisions for obtaining knowledge for pupil learning at regular and frequent intervals, while the latter does not. However, teacher exposition is said to be teacher-centered, it is relatively more student-centered that lecture method. Obtaining knowledge of pupils' learning is accomplished by frequent monitoring of pupils' performance at relevant cognitive tasks and

by observing the non-verbal dimension of the pupils' communication. Teacher exposition, therefore, constitutes constant active interaction between teacher and pupils. A lecture may not necessarily involve the pupils actively.

Advantages of the Teacher Exposition Method

- It enables the teacher to cover a copious amount of information he/she want to cover within a relatively short time
- It enables the teacher to present new material
- It aids the teacher in introducing or over-viewing a course, unit or a topic of study
- It aids the teacher in presenting a summary or synthesis of materials already covered
- It aids the teacher in expanding the understanding of a concept
- It enables the teacher in demonstrating relationships between concepts.

Integrated science teachers are expected to select any teaching method that is appropriate in teaching a particular topic or a combination of methods were necessary in their instructional deliveries. These teaching

methods can be combined in the science class to make the Science and Technology classes a worthwhile exercise.

Impact of Teaching Methods in Integrated Science Courses on the educational Development of Integrated Science Students in Nigerian Institutions

The primary purpose of teaching at any level of education is to bring a fundamental change in the learner (Tebabal & Kahssay, 2017). To facilitate the process of knowledge transmission, it is important for teachers to apply appropriate teaching methods that best suit specific objectives and level exit outcomes. In the traditional epoch, many teaching practitioners widely applied teacher-centered methods to impart knowledge to learners comparative to student-centered methods. Until today, questions about the effectiveness of teaching methods on student learning have consistently raised considerable interest in the thematic field of educational research (Hightower et al., 2018). Moreover, research on teaching and learning constantly endeavour to examine the extent to which different teaching methods enhance growth in student learning. Quite remarkably, regular poor educational development by integrated science students is fundamentally

linked to application of ineffective teaching methods by integrated science teachers to impact knowledge to learners (Adunola, 2016).

Adequate and previous research on the effectiveness of teaching methods indicates that the quality of teaching is often reflected by the achievements of learners. According to Ayeni (2019), teaching is a process that involves bringing about desirable changes in learners so as to achieve specific outcomes. In order for the method used for teaching to be effective, Adunola (2016) posited that teachers need to be conversant with numerous teaching methods that take recognition of the magnitude of complexity of the concepts to be covered.

Gibbs and Jenkins (2016) argued that the context of class and society has changed, but the teaching methods have remained unchanged. Various recent studies attempting to address the issues that affect teaching methods and student learning today include educational technology integration (Abbitt, 2019), teachers' roles (Webb, 2019), the class environment (Doll et al., 2018), understanding the adult learner (Kisamore, Aldridge, Alexander, & White, 2018), length of the class session (Coskun, 2017), increasing class size in schools (Gibbs & Jenkins, 2016), students' attitudes (Akkuzu &

Akcay, 2018), as well as the increased interdependence of society today (Schul, 2018). Flexibility is crucial in adapting teaching methods in the class. Since all teachers are different, the methods they use, and the way they use them will depend on the context and situation of their class (McCornac & Phan Thuy, 2015), as well as their own personality and biases.

The impact of teaching methods on integrated science courses on the educational development of integrated science students learning in Nigerian institutions should be the interest of every teacher and student. In the field of education, there have been various studies done in an attempt to measure teaching methods. Robinson (2016) conducted a case study on several teaching methods in schools to explore the reasons for their use, and perceptions of effectiveness. The result of their study suggested that various methods do influence teaching effectiveness. According to Keene (2008), each student learns best using methods and objectives that reflect his experiences, abilities, aptitudes and interest. Similarly, there is no standard teaching method. The various teaching methods overlap in definition and application; none being mutually exclusive although researchers often delineate several teaching methods.

Integrated Science courses and education is essential for 21st-century education (Kalogiannakis et al., 2021) and should begin at a young age (Tavares et al., 2021). The growing number of global, technological, and scientific advancements have necessitated adequate performance in science education at all levels of education (Taştan et al., 2018). Good teaching methods in integrated science aids the imparting of scientific knowledge and methods to students who do not have a scientific background (Ohunene & Ebele, 2016). Integrated Science courses entails teaching students critical thinking, fundamental scientific skills, practical steps, creativity, and originality in scientific explorations. According to Olayinka (2019), integrated science courses is the study of knowledge that can be transformed into a system based on evaluative facts and in order to achieve this, there is need for the adequate utilization of appropriate teaching methods to aid the educational development of pupils. Educational development of pupils is important because it will enable the Individuals and nations through the knowledge gained from integrated science courses to survive and meet global economic goals. A substantial body of literature has linked science education to human, national, and economic development (Agarkar, 2017).

Integrated Science courses is based on reasoning, problem-solving, and processes. Hence, it aids the educational development of students and it impact student's through exposing them to science process skills (Hernawati et al., 2018). Science process skills refer to learning abilities that need to be embedded, practiced, and owned by students (Wahyuni et al., 2017). It is the procedural skills, experimental and investigative science habits of mind, or scientific inquiry abilities expected of science learners. Thus, the vital role of integrated science education is to equip the learners with science process skills (Ekici & Erdem, 2020). Science process skills denote critical indicators of teaching objective accomplishment (Gunawan et al., 2019).

Moreover, science process skills entail integrating scientific skills, knowledge, and favorable attitudes to advance a better understanding of scientific concepts. The science process skills are embedded in scientific thinking and decision-making (Yumusak, 2016). Hence, instructors must use facts, concepts, and theories to guide students through scientific investigation. Furthermore, integrated science education teach students how to get involved in inquiries. This is possible through training students in the science process skills (Hernawati et al., 2018). Science process skills (SPS)

describe procedural skills, experimental and investigating science habits of mind, or scientific inquiry abilities.

Science process skills include observing, measuring, classifying, communicating, predicting, inferring, using numbers, questioning, controlling variables, hypothesizing, defining operationally, formulating models, designing an experiment, and interpreting data (Asy'ari et al., 2019). Similarly, SPS has been widely studied in two categories, including basic and integrated science process skills (Duda & Susilo, 2019). The basic (simpler) process skill (classifying, predicting, inferring, measuring, observing, and communicating) provides a foundation for scientific learning. The integrated (more complex) skills (interpreting, experimenting, hypothesizing, formulating methods, and identifying variables) describe improved scientific knowledge. Basic science processes are critical for science learning and promote affective reactions to science concept formulation at the primary and junior secondary school levels. More complex and integrated science are more appropriate at the secondary and tertiary school levels to form models.

Factors affecting the Utilization of Teaching methods in Integrated Science Courses for Integrated Science Students in Nigerian Institutions

The teaching and learning of Integrated Science courses in Nigerian institutionsis to promote national development and make the country achieve its strategic programme of scientific and technological literacy (Olayinka, 2019). Integrated Science courses solicits the perspectives of the individual science disciplines, and integrates them during all phases of the approach to solve scientific and resource management problems. It is required of Integrated Science teachers to have diverse ideas to examine the linkages among single discipline perspectives, to develop new methods, concepts and approaches during teaching and also to teach integrated science through inquiry to young ones.

Utilization of teaching methods in Integrated Science is crucial for developing scientifically literate citizens and improving economic productivity for sustainable development (Ebele, 2016). It enhances student's achievements, strengthens public confidence in schools and helps students attain conceptual understanding. Quality teaching can only be achieved through the incoporation of god teaching methods and this is

characterized by teacher's adequate knowledge of subject matter; encouraging inquiry and hands-on approach to learning for students and recognizing individual students as learners as the teacher builds on learner's strengths rather than trying to stamp out their weaknesses.

The teaching methods in integrated science courses for integrated science students helps teachers to focus on educational improvement of learners through the integration of adequate knowledge of the curriculum, content areas, functional pedagogical skills, critical reflective teaching, empathy commitment to the educational process and acquisition of managerial competences within and outside the school context. The utilization of teaching methods in teaching Integrated Science courses during teaching and learning could be affected by factors such as:

- inappropriate and inadequate instructional materials
- inappropriate instructional strategies used by teachers
- poor teacher preparation before lessons
- poor attitude and interest of students towards the subject.

Furthermore, intelligence, cognitive styles and personality are individual characteristic that play important roles in teaching and learning of

integrated science courses and the other variables such as motivational orientation, self-esteem and learning approaches are important factors that affect the usage of teaching methods by teachers when teaching integrated science courses. Opara and Etukudo (2015) posited that with adequate instructional materials and methods, the teacher will be able to give students the chance to learn through their senses of hearing, smelling, tasting, seeing and feeling. A study conducted by Azure (2015) in Ghanaian Senior High Schools revealed that students were not led to carry out activities as suggested by the Integrated Science curriculum; teachers taught without performing activities as suggested in the curriculum. It was also revealed that students were made to read textbooks while teachers explained some of the concepts.

Summary of Reviewed Literature

One key responsibility of teachers especially those teaching integrated science courses to integrated science students in Nigerian institutionsis to impart requisite skills/knowledge that will enable the student function well in the society through goood teaching methods as it prepares them for the world outside of school. If teaching method adopted in teaching are

inadequate or ineffective, students' academic performance will be low. Integrated science education plays a vital role in the lives of individuals and the development of a nation scientifically and technologically (Alebiosu and Ifamuyiwa, 2008). It is widely and generally acknowledged that the gateway to the survival of a nation scientifically and technologically is scientific literacy which can only be achieved through integrated science education. To make her citizens show interest in science education, Nigerian government came up with a policy that 60% of the students seeking admission into the nation's universities, polytechnics and colleges of education should be admitted for science oriented courses, while 40% of the students should be considered for arts and social science courses (Ajibola, 2008).

This government's effort cannot be said to have yielded much fruits given the dwindling nature of students seeking admission into science-oriented courses in the Nation's tertiary institutions, more students are seeking admission into art and social science courses than those of the science-oriented courses on yearly basis. Disturbed by this ugly development, researchers in the field of science education in Nigeria

embarked on series of studies to find the logic behind this ugly development. They found that the problem stemmed from the first form of science a child comes across at the JSS (Junior Secondary School) level, that is integrated science which is influenced by the methods utilized in teaching.

Integrated science provides students sound basis for further science education study, hence a child that is no well grounded in integrated science at this level would not show interest in offering core science subjects (biology, chemistry and physics) at the SSS (Senior Secondary School) level which are the prerequisites for studying science-oriented courses at the Nation's tertiary Institutions. They also found that lack of qualified teachers, lack of equipments and facilities for teaching, lack of practical works, insufficient allotment of time for integrated science on the school time-table and poor methods of teaching are the major factors militating against the successive implementation of the core curriculum in integrated science (Afuwape and Olatoye, 2015).

The aforementioned problems of teaching integrated science did not include non sequential arrangement of some of the integrated science concepts in the curriculum. It is believed that if integrated science concepts

are not taught from known to unknown and from simple to complex, it is likely that students might find it difficult to understand the concepts taught.

CHAPTER THREE

METHOD OF THE STUDY

Research methodology refers to the process by which the specific steps of a study is conducted (Burns & Groove, 2009).

This chapter focuses on the research methodology that was used in this study. The following sub-topics are discussed in this Chapter.

- Research design
- Population of the Study
- Sample and sampling technique
- Instrumentation
- Validity of the instrument
- Reliability of the Instrument
- Administration of the instrument
- Method of analysis

Research Design

The survey research design was adopted to assess the methods of teaching integrated science courses to integrated science students in Nigerian Institutions. According to Olaitan (2012) survey research method enables the

researcher to carry out investigation and obtain information across population of the Study without manipulation of the variables and make reference to the population of the Study.

Population of the Study

The population of the study comprises of all the integrated science students in Nigerian institutions.

Sampling and Sampling Technique

Sample selection describes the process by which a designated portion is selected to represent the entire population. The sampling technique is the method employed in selecting the respondents to be used for the study (Wood & Harber, 2006).

This study was conducted in 2023, where a representative sample of 200 integrated science students across the four levels of Integrated Science Education course area in the department of CIT, University of Benin was randomly selected from the Nigerian institutions offering Integrated science courses for this study. The simple random sampling technique was used to select 50 respondents from each level of the course area from the four levels, making a total of 200 respondents used for this study.

Research Instrument

The instrument for this study is the questionnaire. A four- point modified Likert (1932) summated rating scale was employed for measurement. The rating scale comprises two sections section A and B. Section A contains demographically details of the respondents while in section B, respondents are expected to tick any of the options assessing each variable.

Validity of the Instrument

For the goal of validation, the research instrument was given to my research supervisor and two other research experts in the field. This was done to verify that the questions on the questionnaire were adequately phrased to satisfy the respondents' comprehension levels and that the study goals were addressed completely. Corrections made were incorporated to ensure content validity and thus achieve the objectives of this study.

Reliability of the Instrument

This refers to the degree to which an assessment tool produces stable and consistent results (Colin & Julie, 2006). Reliability is concerned with consistency, accuracy, precision, stability, equivalency and homogeneity. A

reliable instrument is one that can produce the same results if the behavior is measured again by the same scale, Wood and Haber (2006).

The reliability of the data obtained was established using the test-retest method. The instrument was administered twice to the respondents, then the scores obtained from both administrations were used to determine the reliability coefficient of 0.783, using the Pearson product-moment correlation coefficient (r).

Method of Data Collection

Distribution and collection of completed questionnaires was by the researcher using the "on-the-spot" approach. The researcher used this strategy to guarantee that time was spent wisely and that no copies of the questionnaire were lost. The questionnaire was collected same day it was administered.

Method of Data Analysis

Data analysis is the process of categorizing, scrutinizing, and cross checking the research data (Basavanthappa, 2007). The data was analyzed using the descriptive method such as simple percentage counts.

CHAPTER FOUR

PRESENTATION OF RESULTS AND DISCUSSION OF FINDINGS

This chapter deals with presentation of results and discussion of findings. The research questions were analysed. The data were carefully examined and analysed to offer answers to the research questions. The number of responses in the items were counted and the corresponding percentages calculated. Furthermore, sixty (50) questionnaires were used to sample the respondents' opinions. The respondents were drawn from 50 sudents in the department of CIT, University of Benin.

Demographic Attributes

Table 1: Gender of Respondents

Gender	Frequency	Percentage (%)
Male	17	34%
Female	33	66%
Total	**50**	**100%**

***Source**: Field survey, 2023*

From Table 1 above, the total sample size was 50 respondents out of which 17 of the respondents are male representing 34% of the respondents, while 33 of the respondents are female representing 66% of the respondents

Therefore, it can be inferred that majority of the respondents are female, making 66% of the total respondents.

Table 2: Respondents' Religion

Religion	Frequency	Percentage (%)
Christianity	45	90%
Muslim	5	10%
Others	0	0%
Total	**50**	**100**

***Source**: Field survey, 2023*

From Table 2, the total sample size was 50 of which 87 (87%) of the respondents are Christians, while 5 (10%) of the respondents are Muslim. Lastly, all none of the respondent belong to other religions. Therefore, it can be categorically inferred that majority of the respondents are Christians.

Table 3: Respondents' Age

Years	Frequency	Percentage (%)
18-20 years	6	12
20-25 years	28	56
25-30 years	8	16
Above 30 years	8	16
Total	**50**	**100%**

***Source**: Field survey, 2023*

From Table 3 above, the total sample size was 50 respondents out of which 6 of the respondents are between 18-20 years representing 12% of the respondents. 28 of the respondents are between the ages of 20 – 25 years representing 56% of the respondents, while 8 of the respondents are between the ages of 25 - 30 years representing 16% of the respondents and also 8 of the respondents are between the ages of 30 years and above representing 16% of the population. Therefore, it can be inferred that majority of the respondents are between the ages of 20 – 25 years.

Analysis of Research Questions

Question 1: What are the methods of teaching Integrated Science in Tertiary institutions in Edo State?

Table 4: Respondents' view on the methods of teaching Integrated Science in Tertiary institutions in Edo State

S/N	ITEM	YES	NO
1	My lecturer uses lecture method (chalk and talk teaching)	46 (92%)	4 (8%)
2	When teaching in class, my lecturer demonstrates what he or she is teaching	12 (24%)	38 (76%)
3	We go on field trips	10 (20%)	40 (80%)
4	We are given projects to work on	38 (76%)	12 (24%)
5	We are tasked with topics to find discovery, solution and facts to topics	43 (86%)	7 (14%)
6	I make inquiries about topics through assignments from my lecturers	37 (74%)	13 (26%)

Source: Field survey, 2023

Data from table 4.1 on respondents' view on the methods of teaching Integrated Science in Tertiary institutions in Edo State shows that a total of 46 (92%) responded yes to my lecturer uses lecture method (chalk and talk teaching) while 4 (8.%) of the respondents responded no. This shows that the lecture method is a method that is used in the teaching of integrated science in tertiary institutions. In Item 2, 12 respondents (24%) responded yes to when teaching in class, my lecturer demonstrates what he or she is teaching while 38 (76%) responded no. This shows that there is absence of

the demonstration method in teaching integrated science in tertiary institutions.

In Item 3, 10 (20%) respondents responded yes to we go on field trips while 40 (80%) responded no. This shows that field trip method is not used as much as it should be as a teaching method of Integrated science courses in tertiary institutions. In Item 4, 38 (76%) of the respondents responded yes to we are given projects to work on while 12 (24%) responded no. This shows that the project method is greatly in use as a method of teaching integrated science courses.

In Item 5, 43 (86%) of the respondents responded yes to we are tasked with topics to find discovery, solution and facts to topics while 7 (14%) responded no. This shows that discovery method is used as a method of teaching integrated science in tertiary institutions. In Item 6, 37 (74%) responded yes to I make inquiries about topics through assignments from my lecturers while 13 (26%) responded no. This shows that the inquiry method is used as method of teaching integrated science in tertiary institutions.

Question 2: What instructional materials are available for the teaching of Integrated science in tertiary institutions in Edo State?

Table 5: Respondents' view on the instructional materials are available for the teaching of Integrated science in tertiary institutions in Edo State

S/N	ITEM	YES	NO
7	My lecturer takes us through practical work alongside the theoretical aspect	15 (30%)	35 (70%)
8	We use textbooks to guide the teaching and learning	41 (82%)	9 (18%)
9	My lecturer makes use of the chalk/marker board while teaching	20 (40%)	30 (60%)
10	Posters are available during our lectures	12 (24%)	38 (76%)
11	Charts are available during our lectures	10 (20%)	40 (80%)

Source: Field survey, 2023

Data from table 5.1, Item 7 shows that a total of 15 (30%) responded yes to my lecturer takes us through practical work alongside the theoretical aspect while 35 (70%) of the respondents responded no.This shows that the methods of teaching is not blended properly and it is either just the theoretical aspects alone or vice versa. In Item 8, 41 respondents (82%)

responded yes to we use textbooks to guide the teaching and learning while 9 (18%) responded no. This shows that the textbook is an instructional material available in tertiary institutions to aid the teaching methods.

In Item 9, 20 (40%) of the respondents responded yes to my lecturer makes use of the chalk/marker board while teaching while 30 (60%) responded no. This shows that the chalk/marker board is not really used among by teachers to aid the teaching methods in tertiary institutions. In Item 10, 12 (24%) of the respondents responded yes to Posters are available during our lectures while 38 (76%) responded no. This shows that they are no posters which helps to explain the concepts and contents of what is being taught to integrated science students in tertiary institutions. In Item 11, 10 (20%) of the respondents responded yes to charts are available during our lectures while 40 (80%) responded no. This shows that charts are not made available by teachers which is part of instructional materials to aid the teaching of integrated science in tertiary institutions.

Question 3: Which of the methods of teaching Integrated science do the students prefer for the teaching of Integrated science in tertiary institutions in Edo State?

Table 6: Respondents' view on the methods of teaching Integrated science that they prefer for the teaching of Integrated science in tertiary institutions in Edo State

S/N	ITEM	YES	NO
12	I prefer the lecture method	23 (46%)	27 (54%)
13	I understand my courses better when my lecturer demonstrates what he is teaching	37 (74%)	13 (26%)
14	I understand my courses better when my lecturer groups us to work together on assignment and tasks	22 (44%)	28 (56%)
15	I understand my courses better when we are given projects to work on various topics before we are being taught	16 (32%)	34 (68%)
16	I understand my courses better when the teacher uses charts, posters to explain in the class	36 (72%)	14 (28%)
17	I understand my courses better when we go on field trips	32 (64%)	18 (36%)

Source: Field survey, 2023

Data from table 6.1, Item 12 shows that a total of 23 (46%) responded yes to I prefer the lecture method while 27 (54%) of the respondents responded no. In Item 13, 37 respondents (74%) responded yes to I understand my courses better when my lecturer demonstrates what he is teaching while 13 (26%) responded no.

In Item 14, 22 (44%) of the respondents responded yes I understand my courses better when my lecturer groups us to work together on assignment and tasks while 28 (56%) responded no. This shows that the student are not comfortable with the group method and the chances of learning properly with that method is low. In Item 15, 16 (32%) of the respondents responded yes to I understand my courses better when we are given projects to work on various topics before we are being taught while 34 (68%) responded no. .

In Item 16, 36 (72%) of the respondents responded yes to I understand my courses better when the teacher uses charts, posters to explain in the class while 14 (28%) responded no. In Item 17, 32 (64%) responded yes to I understand my courses better when we go on field trips while 18 (36%) responded no.

Discussion of Findings

This study was conducted to assess the methods of teaching integrated science courses to integrated science students in Nigerian Institutions. The findings of this study are presented below:

The respondents through their responses on the methods of teaching Integrated Science in Tertiary institutions in Edo State, responded to the various teaching methods that are being used by their instructors in the course of teaching and learning. The students response showed that the lecture method is a method that is highly used in teaching Integrated science in tertiary institutions. Also according to the response of the students in the data obtained, it was observed that the use of demonstration method by teachers is low. Also it was observed that the use of field trip method is very low as a teaching method as students rarely go for field trips or do not even go at all. Also in assessing if students are given projects to work on which is also a teaching method that enhances the understanding of integrated science concepts, it was observed that this method is utilized by the teachers in the teaching of integrated science in tertiary institutions. Also, the students response to being tasked to make inquiry about new topics showed that this

method is highly utilized in the teaching and learning of integrated science. Also teachers make use of the assignment method in teaching integrated science education in tertiary institutions.

Findings from this study, on the instructional materials that are available for the teaching of Integrated science in tertiary institutions in Edo State showed that theoretical works are not completed with practicals were necessary to aid the easy understanding of students in tertiary institutions in Integrated science by their lecturers. Also, the utilization of textbooks to guide teaching and learning is high in the teaching integrated science in tertiary institutions. It was observed that teachers/lecturers rarely use the chalk/marker board in the course of teaching according to the response by the respondents in the data gotten. Also the responses by the students showed that the use of posters and charts as instructional materials to aid the various teaching methods by teachers is very low.

Furthermore, the findings from this study methods of teaching Integrated science that the students prefer for the teaching of Integrated science in tertiary institutions in Edo State showed that the students do not really prefer the lecture method. Also it was observed that students

understand the concepts of the lessons better when their lecturers incorporate the lecture method into their teaching methods. Also the students response on the aspect if they understand the concepts when they are put in groups to learn was on average showing that these method if being used should be complemented with another method to aid and guide the students. Also the students response showed that they do not enjoy the project method of teaching integrated science. Lastly according to the response of the respondents, students prefer when their teachers make use of charts in the classroom to aid their teaching and learning and also enjoy going on field trips as well.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

This chapter has to do with the summary of the study, assessing the methods of teaching integrated science courses to integrated science students in Nigerian Institutions. The conclusion drawn from this research and recommendations made are based on the findings.

Summary

This study assessed the the methods of teaching integrated science courses to integrated science students in Nigerian Institutions. The research questions raised for the study was: to assess the methods of teaching Integrated Science courses to integrated science students in Nigerian institutions, to know the relationship between teacher's qualification/training and the methods of teaching Integrated science courses in Nigerian institutions, to assess the adequacy of the methods and techniques used by Integrated Science teachers in teaching integrated science students in Nigerian institutions.. The study adopted the survey research design. The instrument for data collection was a questionnaire; it was built around the research question by the researcher and validated by the researcher's

supervisor. Data collected were analysed using descriptive statistics by means of simple frequency and percentage The following research questions were raised to guide the study:

- What are the methods of teaching Integrated Science in Tertiary institutions in Edo State?
- What instructional materials are available for the teaching of Integrated science in tertiary institutions in Edo State?
- Which of the methods of teaching Integrated science do the students prefer for the teaching of Integrated science in tertiary institutions in Edo State?

Conclusion

Based on the findings from this study, it was concluded that there is a fair use of adequate methods for the teaching and learning of integrated science education in tertiary institutions in Edo state. The methods used are commendable, however in order to meet quality standards and the upgrade in the technological globalization in the world, there is a need for the adoption of modern methods that are effective and efficient for the teaching and learning of integrated science in tertiary institutions.

Finally although the methods currently being used is fair and quite commendable, it is important to further improve, upgrade and adopt more quality methods. Also there is need to work on the factors that could hinder the adoption of quality methods through intervention by the government and school administrators in the provision of good learning facilities to aid teaching and learning effectively.

Recommendations

Based on the findings and conclusion of the study, the following recommendations were made:

- State government through the state ministry of education should improve the knowledge of teachers on the methods of teaching that can enhance teaching and learning.
- Government should ensure that they make provision for adequate learning facilities and environment in order for teachers to be able to adopt these methods effectively.
- The deans in the faculties where integrated science courses are being taught and the Head of Departments of Integrated science should ensure

they monitor the teaching and learning in order to monitor the adoption and use of effective teaching methods.

- Students should be enlightened properly on the techniques of the various teaching methods and how to adjust properly.

Suggestion for Further Studies

Further studies should be carried out on:

- The knowledge of teaching methods in Integrated science among Integrated science teachers
- Attitude of Teachers towards the adoption of teaching methods in the teaching and learning of integrated science.
- The effects of teaching methods in the teaching and learning of Integrated science.

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QUESTIONNAIRE

AN ASSESSMENT OF METHODS OF TEACHING INTEGRATED SCIENCE COURSES TO INTEGRATED SCIENCE STUDENTS IN NIGERIAN INSTITUTIONS

Dear respondents,

This is designed to assess the methods of teaching integrated science courses to integrated science students in Nigerian institutions.

This research work is purely for academic purpose and will be treated as confidential. You are therefore required to kindly and truthfully respond by providing answers to the questions below.

Thank you.

_____

Chibueze Success Alexandra
Researcher

Section A

Instruction: please tick (√) as appropriate.

Demographic background.

Gender: Male ( ) Female ( )

Religion: Christianity ( ) Islam ( ) Others ( )

Age: 18-20 years ( ) 20-25 years ( ) 25 – 30 years ( ) Above 30 years ( )

Section B

S/N	ITEM	YES	NO
WHAT ARE THE METHODS OF TEACHING INTEGRATED SCIENCE COURSES TO INTEGRATED SCIENCE IN TERTIARY INSTITUTIONS IN EDO STATE?			
1	My lecturer uses lecture method (chalk and talk teaching)		
2	When teaching in class, my lecturer demonstrates what he or she is teaching		
3	We go on field trips		
4	We are given projects to work on		
5	We are tasked with topics to find discovery, solution and facts to topics		
6	I make inquiries about topics through assignments from my lecturers		

WHAT INSTRUCTIONAL MATERIALS ARE AVAILABLE FOR THE TEACHING OF INTEGRATED SCIENCE IN TERTIARY INSTITUTIONS IN EDO STATE			
7	My lecturer takes us through practical work alongside the theoretical aspect		
8	We use textbooks to guide the teaching and learning		
9	My lecturer makes use of the chalk/marker board while teaching		
10	Posters are available during our lectures		
11	Charts are available during our lectures		
WHICH OF THE METHODS OF TEACHING INTEGRATED SCIENCE DO THE STUDENTS PREFER FOR THE TEACHING OF INTEGRATED SCIENCE IN TERTIARY INSTITUTIONS IN EDO STATE?			
12	I prefer the lecture method		
13	I understand my courses better when my lecturer demonstrates what he is teaching		
14	I understand my courses better when my lecturer groups us to work together on assignment and tasks		
15	I understand my courses better when we are given projects to work on various topics before we are being taught		
16	I understand my courses better when the teacher uses charts, posters to explain in the class		
17	I understand my courses better when we go on field trips		