
TEACHING SKILLS AND STUDENTS PARTICIPATION IN LEARNING OF SCIENCE CONCEPTS IN PUBLIC
SECONDARY SCHOOLS IN UYO EDUCATIONAL ZONE, AKWA IBOM STATE, NIGERIA

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ABSTRACT

The study investigated the influence of teaching skills and students participation in learning science concepts in public secondary schools in Uyo Local Government Area, Akwa Ibom State. The study was guided by three research questions and three hypotheses Survey research design was adopted for the study A sample size of 50 SS II students was used for the study A researcher developed instrument tagged "Teaching Skills Checklist (TSC) and Flanders Interaction Analysis Categories Checklist (FIACC) was used in the collection of data for the study. The instruments were duly validated by three experts in Faculty of Education, University of Uyo, Uyo. Cronbach Alpha statistics was used to obtain a suitable reliability coefficient for the instruments. Mean was used in answering the research questions while dependent 1-4est statistics was used in testing the hypotheses at 0.05 level of significance. The findings of the study revealed that there was a significant influence of classroom management. communication and questioning skills on student's participation in learning in science concepts in Uyo Local Government Area, Akwa Ibom State Recommendations were made among others included: Ministry of Education should provide a good learning environment with adequate teaching materials to enhance students participation in learning of science subject, Al individual teachers should ensure adherence to the application of communication, class management and questioning skills in teaching, with different materials to capture and sustain students' interest in learning science concepts.

Keywords: Teaching skills, Students Participation, Science Concepts, Public Secondary Schools, Educational Zone.

INTRODUCTION

BACKGROUND OF THE STUDY

The process by which an individual acquires scientific, physical and social capabilities demanded by the society in which the person is born into is education There is no doubt that the importance of education cannot be underscored because there is no country that has succeeded without educating its people. Education encourages social, economic and cultural progress, tolerance, national and international cooperation (Mark, 2022). From what has been viewed as education by different authorities based on their own perceptions, it can be said that education is the most important component of human resources development and is accorded a pride of place in the developmental activities of many countries for a person to be useful to his/her self and also contribute to the development of the society at large

(Bass, 2017). Teaching and learning in achieving educational goals are to bring about in the learner desirable change in behaviour through critical thinking by the teachers who is essentially a facilitator of students learning (Obi, 2019) As much as possible, the teacher facilitates of learning by permitting the learner's own interests, attitudes, aptitudes and experiences. The role of a teacher is often formal and ongoing. The teachers are vital to achieving educational objectives because they are saddle with the responsibility of teaching the students to enhance students learning. Pius (2017) stated that students would not learn while the teaching is going on except they participate in learning. Students participation in classroom activities refers to the behaviours that students engage themselves in class (Cletus, 2015). This behaviour can take many formats, such as raising questions, responding to ethers questions, participation in discussions, providing feedback, and so on. Fred (2017) posited that students participation in classroom activities has to do with student participation is an assessment of a student's performance in a course outside of their assessments. Items that might be evaluated in student participation are engagement in class discursions, engagement in online discussions and student behaviour in group settings. Cletus (2017) posited that classroom participation might involved face-to-face activities such as seminars, discussions, debates, group work activities, experiments, simulations of placements. Participation in online activities such as discussions in classroom, posting on bulletin boards, online forum or webinars could also be taken into account. Adams (2018) posited that an observer who is observing academic activities in the classroom would notice that students have participated in classroom activities through teachers used of effective teaching skills. Teaching skills are defined as a group of teaching acts or behaviours intended to facilitate students learning directly or indirectly. Teaching skills are comprised of the principles and methods used by teachers to enable students learn. These skills are determined partly on subject matter to be taught and partly by the nature of the learner. For a particular teaching skill to be appropriate and efficient it has to be in relation with the characteristic of the learner and the type of learning it is supposed to bring about (Luke, 2013). However, teaching skills are not a one-size-fits-all proposition (Wood, 2013) Flexibility is crucial in adapting teaching skills in the class since all teachers are different, the strategies they use, and the way they use them will depend on the context and situation of their class (Pally, 2015), as well as their own personality. The effect of teaching skills on students' learning should be the interest of every teacher and student. In addition, teachers' communication skills are important for a teacher in the delivery of lessons to the students (Carter, 2017) Communication skills involve listening and speaking as well as reading and writing. For effective teaching a teacher need to be highly skilled in all these areas. Teacher with good communication skills always make students to participate in learning. Questions asked by the teacher in the course of teaching can contribute to the collective understanding of the class (Adebajo, 2013). Adebajo further said that the content of the questions and the manner in which teachers ask them determines whether or not they are effective. Wilson (2015) observed that some mistakes that teachers make during the question and answer process include asking vague questions. When vague questions are asked, students will usually not know how to respond and may answer the questions incorrectly. Thus, their feelings of failure may cause them to be more hesitant to participate in class, evoke some negative attitudes towards learning, and hinder the creation of a supportive classroom environment (Adebajo, 2013). As one may deduce, questioning is one of the most popular attributes of teaching. For thousands of year, teachers have known that it to possible to transfer factual knowledge and conceptual understanding through the price of asking questions which makes students participate in learning (Evans, 2020). It is in considering the importance of teaching skills in enhancing students' participation in learning that the researcher is motivated to conduct this present study on teaching skills on student's participation in learning science concepts in secondary schools in Uyo Local Government Area, Akwa Ibom State.

STATEMENT OF THE PROBLEM

Teaching of science subjects to the understanding of the students is a very difficult and arduous task. This is one of the major causes of ineffective learning of science subject by students. It is very disappointing that despite the importance of learning activities in the classroom, certain factors hinder student's participation in learning. In order to solve this problem of students not participating in classroom learning as observed by researcher, so many studies have been carried out ranging from school environmental factors to socioeconomic factors but the problem still exist. The researcher having seen the importance of teaching skills of classroom management, communication and questioning skills in enhancing students participation in learning based on the background of the study is motivated to conduct the present research on teaching skills on students participation in learning science subject in secondary schools in Uyo Local Government Area, Akwa Ibom State to see if teaching skills adopted by the teacher would enhance students participation in learning science subjects.

Purpose of the Study

The main purpose of this study is to investigate the influence of teaching Skills on students' participation in learning science subjects in secondary schools in Uyo Local Government Area, Akwa Ibom State. Specifically, the study sought to:

1. The influence of classroom management skill on students' participation in learning science subjects.
2. The influence of communication skill on students participation in learning science subjects.
3. The influence of questioning skill on student's participation in learning science subjects.

Significance of the Study

This study on Teaching Skills and students participation in classroom learning would be of immense benefits to students, teachers, parents, curriculum planners, researchers and educational administrators.

- **Students:** The study will be of significant to the students as they will be guided and motivated to learn easily through the adoption of different teaching skills by their teachers. The study will also provide the platform for students participation in learning science subjects.
- **Teachers:** The study will be significant to the teachers as it will highlight the relative influence of teaching skills on students participation in learning. It will also make the delivering of lessons by the teachers easy. It will also awaken teachers' consciousness to the fact that students learn by experience and that students are to actively participate in every classroom activities.
- **Parents:** The study will be significant to the parents as they will be fulfilled having known that their children are taught by teachers who are skillful in teaching. Also, the parents will be encouraged in motivating their children to study hard.
- **Curriculum Planners:** The study will be significant to the curriculum planners as it will help in redefining the curriculum in sequences of potentials to enhance students participation in learning science subjects.
- **Researchers:** The study will be significant to the researchers as it will serve as a framework for future research in the area of the study. The literature from the study will also give the researchers more knowledge to research on other areas of the study.
- **Educational Administrators:** The study will be significant to the educational administrators as it will motivate them to organize seminars, workshops and other forms of trainings that will fortify the teachers with teaching skills to enhance proper teaching and students' participation in learning science subjects.

Research Questions

1. What is the influence of classroom management skill on students participation in learning science subjects?
2. What is the influence of communication skill on student's participation in learning science subjects?
3. What is the influence of questioning skill on student's participation in learning science subjects?
4. To carry out the study, the following research questions are raised.

Research Hypotheses

To guide the study, the following hypotheses are formulated.

1. There is no significant influence of classroom management skill on student's participation in learning science subjects.
2. There is no significant influence of communication skill on student's participation in learning science subjects.
3. There is no significant influence of questioning skill on student's participation in learning science subjects.

Delimitation of the Study

This study is delimited to the teaching skills and students participation in learning. It is obvious that so many teachers teaching skills could contribute to students participation in learning. But for the purpose of this study only classroom management, communication and asking of questions are selected for investigation. The study is also delimited to SS II students in public secondary schools in the 2022/2023 academic session in Uyo Local Government Area, Akwa Ibom State.

Limitation of the Study

In any research, it is not uncommon for the researcher to encounter a number of problems while collecting data. This work is limited to information obtained from the respondents in form of questionnaire and achievement test. Furthermore, the researcher had limited time and space in the conduct of the research.

Review of the Related Literature

Theoretical Framework

Theories related to the different aspects of teaching skills are reviewed. The theories to be reviewed are Stimulus sampling theory (Estes), Jean Piaget's Theory of Cognitive Development and Cognitive development theory by Ausubel.

Stimulus Sampling Theory (Estes, 1950)

The Stimulus Sampling Theory (SST) was first propounded by William Estes (1950) in an attempt to develop a statistical explanation for learning phenomena. The theory suggested that a particular stimulus-response association is learned on a single trial. However, the overall learning process is a continuous one consisting of the accumulations of discrete stimulus response (S-R) pairings. According to Estes, in any given learning trial, a number of different responses is made relating to the portion that is rewarded. Thus, learned responses are a sample of all possible stimulus elements experienced. Estes opines that the overall learning process is gradual and cumulative.

Stimulus Sampling Theory of learning is related to the present study as learning is a continuous, gradual and cumulative process which a learner has to be stimulated to engage in through the adoption of communication skills by the teacher.

Piaget's Theory of Cognitive Development (Piaget. 1936)

The theory of cognitive development was propounded by Jean Piaget (1936). He lived between 1896 and 1980 Piaget was a Swiss psychologist and genetic epistemologist. A very important implication of Piaget's theory is adaptation of instruction to the learner's developmental level. The content of instruction needs to be consistent with the developmental level of the learner. The teacher's role is to facilitate learning by providing a variety of experiences. Teacher should obviously provide opportunities for learners to explore and experience, by doing so is encouraging learner's new understandings. Piaget emphasizes the Opportunities that allow learners of different cognitive levels to work together and encourage less mature students to advance to create understanding. This theory further emphasizes on the use of concrete hands of experiences on help learners learn additional suggestions. Piaget also emphasizes that teachers should allow opportunities to classify and group information to facilitate assimilating new information with previous knowledge.

Cognitive development theory by Jean Piaget is related to the present study as instruction is delivered to the learners' level by adopting classroom management skills to teach in order to enhance the learners understanding of the concept taught which will thereby provide the platform for students participation in learning.

Research Method

The procedure adopted in carrying out the study is described The procedure is done tender the following sub-headings: the research design, area of the study population of the study, simple and sampling technique, research instrument, validity of the instrument, reliability of the instrument, administration of the instrument, method of data analysis and ethical issues.

Design of the Study

A survey research design was adopted for the study. The research design is considered appropriate for the study because in this design surveys are used as a tool by researchers to gain a greater understanding about individual or group perspectives relative to a particular concept or topic of interest. In this study, information will be collected from a group of respondents who are students to establish the influence of teaching skills on students participation in learning.

Area of the Study

The research area of this study was Uyo Local Government of Akwa Ibom State. Uyo Local Government Area is bounded by Uyo, Ibiono Ibom, Uruan, Nsit Atai, Ibesikpo Asutan, Ikono, Itu. It has a land mass of 241,451 square kilometers. Lying between the Latitude of 4°25'N and 5°32'N North of the equator and longitudes 7:29' of East of Greenwich Meridian with the population of 704,326 people (2006 census figure of the National Population Commission, Abuja). The people of Uyo speak Ibibio and English language. Uyo Local Government is yet to achieve her industrialization drive through the establishment of medium and large scale industries and the government is inviting investors for purposeful investment. The local government is habited by mostly civil servants and there are others that people engaged in to make their such as mechanics, word processing, carpentry, laundry services, driving and security jobs among others.

This Local Government has numerous pre-primary, primary and secondary schools for both public and private. There 14 co-educational secondary schools are in this local government area. These schools are

spread across every nook and cranny of the Local Government. The reason for choosing this area is proximity and for the fact that this research work has not been carried out there before.

Population of the Study

The target population for this study was all the SS II students in all the public secondary schools in Uyo Local Government Area of Akwa Ihom State. According to the Akwa thom State Secondary Education Board, there are 2171 SS II students in the 2024/2025 academic session in the 14 public secondary schools in Uyo Local Government Area.

Sample and Sampling Technique

The sample size for the study was 40 SS II students that were drawn from 5 Public Secondary Schools in Uyo Local Government Area of Akwa Ibom State. The simple random sampling technique was employed to obtain a sample of students based on the number of students in each of the 5 Public Secondary Schools that were used for the study Simple random sampling technique was adopted by the researcher in selecting the students for the study to give students equal chance of being used for the study.

Instrumentation

Teaching Skills Checklist (TSC) and Flanders Interaction Analysis Categories Checklist (FIACC) will be used in measuring used in measuring students interactions during teachers exhibition of teaching skills in collecting data for the study the 10 categories on Flanders interaction scale would be considered to exhibited by students based on the three sub-independent variables of teaching skills selected by the researchers for investigation. The TSO will be used in recording observations for the sub-independent variables of teachers classroom management, communication and asking questions while FIACC will be used in measuring the dependent variable of students interaction or participation in learning The instrument consists of two sections A and B. The A part of the instrument was used in eliciting demographic information of the respondents while the B part of the instrument contains items that were used in observing the number of times a particular teaching skill that enhance students participation in the learning occur. The frequency of students' exhibition of learning through participation would be recorded in the observation check list.

Validation of the Instrument

The instrument went through face validation by three experts. The experts were two lecturers in Educational Evaluation from the Department of Psychological Foundations and one lecturer of Chemistry Education, all in Faculty of Education, University of Uyo, Uyo. The experts were asked to check the items on the instrument if they were in-line and suitable with the requirements for teaching skills and students participation in learning. The objectives of the study and the statement of problem were made available to the experts at the time of the validation process, Suggestion on dropping and restructuring some of the items written initially were from them. Their suggestions were effected in the final copy of the instrument.

Reliability of the Instrument

An instrument is said to be reliable when it measures what it is designed to measure consistently (Nelson, 2019). To establish the reliability coefficient of the instrument, an internal consistency approach was adopted. The researcher will use Flanders Interaction Checklist and record the observation on students learning with students who will not take part in the main study. A suitable inter and intra reliability coefficient will be obtained for the instrument.

Method of Data Collection

The researcher will obtain a letter of introduction from Faculty of Education University of Uyo for permission to carry out the study in the selected secondary schools. The researcher, after obtaining

permission to carry out the study in the schools involved explained the purpose of the study to the school principal and the students concerned that the research work would help in examining teaching skills and students participation in learning. After the explanation, the researcher used the Flanders Interaction Analysis Checklist in recording the observed students participation activities and will later take it for analysis.

Method of Data Analysis

Mean will be used in answering the research questions while dependent t-test will be used in testing the hypotheses at 0.05 level of significance.

Decision Rule

In testing the hypotheses, the null hypotheses will be rejected when the calculated t-value is greater than the tabulated t-value and the test will be significant and will be accepted when the calculated t-value is less than the tabulated t-value and the test will not be significant.

Ethical Consideration

The researcher ensured that the respondents that constituted the sample size of the study were knowingly and voluntarily given their consent to be part of the study as no information was concealed to enhance participation.

The respondents were duly informed of the possible benefits of the research. The researchers also assured the respondents that their responses were going to be treated as confidential and strictly used for the purpose of this study.

Results

The results of the study are presented in accordance with the research questions and hypotheses.

Answers

Answers to research questions and hypotheses testing are done in this section.

Research Question 1

What is the influence of teachers' classroom management skill on students' participation in learning science subject?

Table 1: Summary of Descriptive Statistics on the Influence of Teachers' Classroom Management Skill on Students Participation In Learning science subject (n = 50)

Variables	Mean	SD	Difference
Teachers' Classroom Management Skills	3.12	1.25	0.98
Students Participation in Learning	2.14	1.31	

The summary of the result as shown in table 1 indicates that the mean influence of teachers' classroom management skills is 3.12 and that of students participation in learning science subject is 2.14. The mean difference between the two variables is 0.98 with the mean influence of teachers' classroom management skills taking the lead. The mean influence of teachers' classroom management skills on students' participation in learning is 3.12.

Research Question 2

What is the influence of teachers' communication skill on students' participation in learning science subject?

Table 2: Summary of Descriptive Statistics on the Influence of Teachers' Communication Skill on Students Participation in Learning science subject (Chemistry) (n = 50)

Variables	Mean	SD	Difference
Teachers' Communication Skills	3.42	1.61	1.28
Students Participation in Learning	2.14	1.31	

The summary of the result as shown in table 2 indicates that the mean influence of teachers' communication skills is 3.42 and that of students participation in learning science subject is 2.14. The mean difference between the two variables is 1.28 with the mean influence of teachers' communication skill taking the lead. The mean influence of teachers' communication skill on students' participation in learning is 3.42.

Research Question 3

What is the influence of teachers' questioning skill on students participation in learning science subject?

Table 3: Summary of Descriptive Statistics on the Influence of Questioning Skill on Students Participation in Learning science subject (n = 50)

Variables	Mean	SD	Difference
Teachers' Questioning Skills	3.56	1.37	1.42
Students Participation in Learning	2.14	1.31	

The summary of the result as shown in table 3 indicates that the mean influence of teachers' questioning skills is 3.56 and that of students participation in learning science subject is 2.14. The mean difference between the two variables is 1.42 with the mean influence of teachers' questioning skill taking the lead. The mean influence of teachers' questioning skill on students' participation in learning is 3.56.

Testing of Hypothesis

Hypothesis 1

There is no significant influence of teachers' classroom management skill on students' participation in learning science subject?

Table 4: T-test analysis on the Influence of Teachers' Classroom Management Skill on Students Participation in Learning science subject (n = 50)

Variables	Mean	SD	t-value	t-critical	df	Decision
Teachers' Classroom Management Skills	3.12	1.25				
			3.27	1.96	49	significant
Students Participation in Learning	2.14	1.31				

*Significant at 0.05 Alpha Level

Table 4 shows that the calculated t-value of 3.27 at 49 degree of freedom and 0.05 alpha level of significance is greater than the critical t-value of 1.96. The null hypothesis is therefore rejected. Hence,

there is a significant influence teachers' classroom management skill on students' participation in learning science subject in Uyo Local Government Area, Akwa Ibom State.

Hypothesis 2

There is no significant influence of teachers' communication skill on students' participation in learning science subject?

Table 5: T-test analysis on the Influence of Teachers' Communication Skill on Students Participation in Learning science subject (n = 50)

Variables	Mean	SD	t-value	t-critical	df	Decision
Teachers' Communication Skills	3.42	1.61	2.74	1.96	49	significant
Students Participation in Learning	2.14	1.31				

*Significant at 0.05 Alpha Level

Table 5 shows that the calculated t-value of 2.74 at 49 degree of freedom and 0.05 alpha level of significance is greater than the critical t-value of 1.96. The null hypothesis is therefore rejected. Hence, there is a significant influence teachers' communication skill on students' participation in learning science subject in Uyo Local Government Area, Akwa Ibom State.

Hypothesis 3

There is no significant influence of teachers' questioning skill on students' participation in learning science subject?

Table 6: T-test analysis on the Influence of Teachers' Questioning Skill on Students Participation in Learning science subject (n = 50)

Variables	Mean	SD	t-value	t-critical	df	Decision
Teachers' Communication Skills	3.42	1.61	2.74	1.96	49	significant
Students Participation in Learning	2.14	1.31				

*Significant at 0.05 Alpha Level

Table 6 shows that the calculated t-value of 3.43 at 49 degree of freedom and 0.05 alpha level of significance is greater than the critical t-value of 1.96. The null hypothesis is therefore rejected. Hence, there is a significant influence teachers' questioning skill on students' participation in learning science subject in Uyo Local Government Area, Akwa Ibom State.

Findings of the Study

Based on the analysis of data, the following findings emerged:

- 1) There is a significant influence of teachers' classroom management skill on students' participation in learning science subject.
- 2) There is a significant influence of teachers' communication skill on students' participation in learning science subject.
- 3) There is a significant influence of teachers' questioning skill on students participation in learning science subject.

Summary, Conclusion and Recommendations

This chapter is organized under subheads of summary, conclusion, implications of the study, recommendations and suggestions for further studies.

Summary

The purpose of this study was to investigate teaching skills and students participation in learning in secondary schools in Uyo Local Government Area, Akwa Ibom State. To achieve this purpose, three research questions were raised to guide the study and three null hypotheses were formulated and tested at 0.05 level of significance.

Literature review was carried out according to the variables of the study. The research design adopted for the study was the ex-post facto research design. The populations of the study comprised all the SS II students in public secondary schools in Uyo Local Government Area of Akwa Ibom State. The sample size for the study was 50 SS II students that were drawn from 5 Public Secondary Schools in the Local Government Area of Akwa Ibom State. Taro Yamens' formula was used in obtaining the sample size for the study. Simple random sampling technique was used in selecting the sample of size for the study. Teaching Skills Checklist (TSC) and Flanders Interaction Analysis Categories Checklist (FIACC) were the instruments used by the researcher in collecting data for the study. The instruments were duly validated by three experts in Faculty of Education, University of Uyo, Uyo, Cronbach Alpha Statistics was used to obtain a reliability coefficient of 0.82 for the instrument. The findings from the study revealed that there was a significant influence of classroom management, communication and questioning skills on students' participation in learning science subject in Uyo Local Government Area, Akwa Ibom State.

Conclusion

Based on the data collected and analyzed in the study, it was concluded that: There was a significant influence of classroom management, communication and questioning skills on students participation in learning science subject such as chemistry in Uyo Local Government Area, Akwa Ibom State.

Educational Implications of the Findings

One of the educational implications of the study is that the influence of teachers' classroom management skills while teaching Chemistry would enhance the calmness of the classroom and thereby make the students to be focus in what is taught to promote participation in Learning. Also, another educational implication of findings of the study is that teachers' communication skill is crucial to student's participation in learning. This is possible because effective communication by the teacher would enhance students understanding of the concept of science taught in public secondary schools and would thereby promote their participation in learning science subject. Finally, another educational implication of findings of the study is that teachers questioning skill is very important to student's participation in learning Chemistry, this is possible because when teachers questions the students to ascertain their understanding of the concept taught, this would serve as a form of student's evaluation and thereby enhance their participation in learning.

Contribution to Knowledge

The present study has made enormous contribution to knowledge. It has provided empirical evidences on teaching skills and students participation in learning science subject in Uyo Local Government Area, Akwa Ibom State. This would bridge the gap that was discovered during review of related empirical studies.

Recommendations

1. Seminars and workshops should be organized by professional bodies such as Nigerian Union of Teachers (NUT) and the State Ministry of Education to acquaint science teachers on the use of proper teaching skills in teaching the students.
2. Ministry of Education should provide a good learning environment with adequate teaching materials to enhance students participation in learning of science subject.
3. Curriculums developers should incorporate the suggested teaching skills which include: Classroom management, communication and questioning skills in developing the curriculum to enhance the proper teaching of lessons in learning science subject.
4. Individual teachers should ensure adherence to the application of communication, classroom management and questioning skills in teaching, with different materials to capture and sustain students interest in learning science subject.

Suggestions for Further Studies

Further research should be carried out in this area and other areas. As an offshoot of this research, the following areas should be further investigated:

1. Parental variables and students participation in learning science subject in Uyo Local Government Area.
2. Teaching strategies and students' participation in learning science subject in Uyo Local Government Area.
3. Teaching environment and students' participation in learning science subject in Uyo Local Government Area.

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