

# **Perceived Impact Of Practical Activities On Attitude, Skills Acquisition And Performance In Chemistry Among Secondary School Students For Sustainable Development In ORLU LGA In Imo State.**

<sup>1</sup> Glory Okore, , <sup>1</sup>Elizabeth Elenwoke, <sup>1</sup> Chioma Ibe, Prisca Ikechukwu-Nwankwo, <sup>1</sup>Mary-Claret Nwaodu, Chibuzo Okamgba

<sup>1</sup>Department of Chemistry, Alvan Ikoku Federal University of Education, Owerri, Imo State, Nigeria  
Correspondence Email: gloriyokore150@gmail.com

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## **Abstract**

*The study aimed at determining the perceived impact of practical activities on attitude, skills acquisition and performance in chemistry among secondary school students in Orlu Local Government Area in Imo State. The study adopted a survey non-experimental design to investigate and describe existing conditions. The population of the study comprised the chemistry students from ten government-owned senior secondary schools (SSS) in Orlu L.G.A. totaling 5976. A sample size of 282 was obtained by taking 20% of each of five randomly selected SSS chemistry students from the entire population. The instrument for data collection is a self-structured questionnaire with four-point Likert scale of strongly agree, agree, disagree and strongly disagree. The findings of the research work show that students taught with practical method have mastery of the subject, are more productive, more competent, more creative adopt the subject for a career and develop science process skills more than those taught with lecture method. It was recommended that the government should fund the school effectively by providing the necessary infrastructural facilities and amenities needed by the schools to standardize teaching and learning processes.*

**Keywords:** *attitude, chemistry impact, performance, practical activities*

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## **I. Introduction**

Practical activities are seen as activities students undertake in the laboratory using equipment and reagent. Abdullahi, (2017) states that when chemistry concept are taught using practical activities they enhance the quality and the extent of scientific understanding that could be achieved by students. Kallats (2015) see practical activities as a means to verify science principles, or theory already known to the students. Chemistry has been identified as a very important science subject and it's important in science and technological development of any nation has been widely reported (Adesoji, 2018). Umar (2011) investigated the effects of biology practical activities on students' process skill acquisition in Minna, Niger State. The design of the study was quasi-experimental.. The sample consisted of one hundred and eleven senior secondary one biology students (60 males and 51 females) randomly drawn from two senior secondary schools in Minna, Niger State. Three research questions and three hypotheses guided the study. The treatment consisted of teaching a selected biology concept—"Animal nutrition" to the experimental group using practical activity method while the control group was taught the same concept using the lecture method. The Science Process Skill Acquisition Test (SPSAT) designed by the researcher, was the instrument used for data collection. The data collected were analyzed using mean and standard deviation to answer the research questions while Analysis of Covariance (ANCOVA) was used to test the hypotheses at 0.5 level of significance. The results revealed that practical activity method was more effective in fostering students' acquisition of science process skills than the lecture method. Nneka and Zita (2020) investigated the effect of practical activities on achievement in Biology among secondary school students in Anambra State. The design was Quasi experimental control group design. A sample of 400 SS II biology students (205 experimental group and 195 control group) were purposively selected from six secondary schools (3 male and 3 female schools) located in Onitsha education zone of Anambra State. Two research questions and two null hypotheses guided the study. The instrument for the study was Biology Achievement test. The data collected were analyzed using t-test at 0.05 level of significance. The result revealed significant difference between students exposed to practical activities and those taught in the conventional way.. Garba (2021) investigated teaching strategies considered suitable for enhancing skill acquisition among Office Technology and Management (OTM) Students in Kano

State Polytechnic. Two research questions guided the study and one null hypothesis was tested at 0.05 level of significance. The population and sample of the study was 23 lecturers of OTM. A 5- point structured questionnaire was used for data collection. The reliability of the instrument was ensured using test-retest which yielded coefficient value of 0.81. Data collected were analyzed using mean and standard deviation to answer the research questions. T-test was used to test the hypothesis. Findings revealed that teacher-centered teaching strategy was moderately suitable for enhancing skill acquisition among OTM students. Sunday (2018) examined the effects of multimedia instructional strategies on chemistry students' science process skills acquisition and achievement in Kano state. Six research questions and six null hypotheses guided the study.. The design of the study was quasi-experimental, specifically pre-test, post-test, non-equivalent control group design. A random sampling technique using balloting method was used in selecting three public senior secondary schools out of the sixty-five (65) secondary schools in Nassarawa Education Zone because of the experimental nature of the study. Eighty-one (81) students were used for the two experimental groups and thirty-nine (39) students were used for the control group. All the groups were intact classes. The instruments used in data collection are science process skills acquisition test.. The data collected were analyzed using mean, standard deviation, t-test, analyzing of covariance (ANCOVA) and Scheffe post hoc test at 0.05 level of significance. The findings of the study revealed that multimedia instructional strategy improved both the acquisition of science process skills and academic achievement better than the conventional laboratory method. Paul, Emmanuel, Emmanuel and Damoeroem (2021) investigated how utilizing interactive students' notebook with feedback strategies could enhance science process skills acquisition, performance in and attitude towards physics in Plateau state, Nigeria. Three research questions and three null hypotheses formulated guided the study. The study adopted quasi-experimental research design. The population consists of 3,182 Senior Secondary (SS) II Physics students. A sample of 113 SS II Physics students in four intact classes was used for the study. Physics Students' Academic Performance Test (PSAPT), Test of Physics Related Attitude (TOPRA) and Test of Science Process Skills Acquisition (TOSPSA) were used for data collection. Data were analyzed using mean and standard deviation. Analysis of Covariance (ANCOVA) was used to test the null hypotheses at 0.05 level of significance. It was found that there was significant difference in the mean attitude scores towards physics students taught using the interactive students' notebook with feedback and those taught using the conventional strategy. Udogu and Emendu (2017) investigated the impact of practical activities in chemistry laboratory exercises in schools in Nigeria. The study covered all the secondary schools in five eastern states of Nigeria. A survey research design was employed. Four hundred chemistry teachers were used as sample from all the chemistry teachers in the five states. Structured questionnaire was used for data collection. Three research questions were answered. Means and standard deviations were used to answer the research questions. Results show that the practical activities have an impact on the chemistry laboratory exercises by familiarizing with students, helping to induce the scientific attitude to the student as well as helping the students to maintain interest in chemistry. Rebecca and Nsimeneabasi (2017). investigated the effects of practical activities and manual on science students' academic performance on solubility in Uruan Local Education Authority of Akwa Ibom State. The study adopted pretest, posttest non randomized quasi experimental design. Three research questions and three hypotheses were formulated to guide the study. One hundred and four (104) science students from the population of two thousand, nine hundred and fifty (2, 950) senior secondary two in 2015/2016 academic session formed the sample size using simple random sampling technique. Instrument for data collection was a 20-multiple-choice-test item on the concept of solubility. The research questions were answered using mean and standard deviation while the hypotheses were tested using Analysis of Covariance (ANCOVA). The findings of the study showed that students taught solubility with practical activities performed equally with their counterparts taught the same concept with practical manual. Results also showed that gender had no significant influence on the students' mean performance scores when taught solubility with practical activities and practical manual.

### **Research Questions**

The following research questions were raised..

1. What is the difference between the attitudinal change of secondary school chemistry student exposed to practical activities and those taught using lecture method?
2. What is the difference between the level of skills acquired by secondary school chemistry student exposed to practical activities and those taught using lecture method?
3. What is the difference between performance in chemistry of student exposed to practical activities and those taught using lecture method?

**II. Material and Methods**

**Study Design:**

The study adopted a descriptive survey design aimed at gathering information on the influence on the difference in attitude on skills acquired and performance of students taught with practical based method of instruction and those taught with lecture method.

**Study Location:**

This study was carried out in Orlu local government area of Imo state, it is one of the (27) local government area in Imo state and the political zone of Imo state. The study was conducted among Senior Secondary-2 (SS2) Council Area of Imo State, Nigeria. Imo State is a very important state in South-Eastern Nigeria.

**Study Duration:** December 2021 to May 2022

**Sample size:** A sample size of 282 was obtained by taking 20% of each of five randomly selected SSS chemistry students from the entire population of 5976.

**Data Collection and Statistical analysis:** Data was collected quantitatively with a well structured questionnaire to elicit information on the perception of students on impact of practical activities on attitude, skills acquisition and performance in chemistry among secondary school students for sustainable development in Orlu L.G.A of Imo State, Nigeria. The data was analyzed based on statistical mean and percentage. Results were summarized as follows.

Strongly Agree (SD)	4Points
Agree (A)	3Points
Disagree (D)	2Points
Strongly Disagree (SD)	1Point

**III. III.Result**

**Research Question One:** What is the difference between the attitudinal change of secondary school students exposed to practical activities and those taught using lecture method?

**Table 1:** Mean and percentage of students’ responses to research question one

S/N	Questionnaire Items	Total no of Respondents	Total Score	SA	A	D	SD	Mean	DECISION
The	student taught with practical in chemistry mastered the subject more than the student taught with lecture method	282	832	46%	33%	17%	4%	3.0	Agree
The	student taught in chemistry laboratory with practical had confidence to attend to questions, unlike those taught in lecture method	282	718	29%	46%	17%	8%	2.5	Agree
There is	effective teaching and learning among students taught in laboratory than students taught with lecture method	282	762	42%	31%	21%	6%	2.7	Agree

Classes in laboratory is active while classes in lecture method is passive	282	866	46%	42%	9%	2%	3.1	Agree
There is student teacher relationship among students taught in practical laboratory than students taught in lecture method	282	792	35%	46%	15%	4%	2.8	Agree
<b>Grand mean</b>							<b>3.5</b>	<b>Accepted</b>

In table one, items 1, 2, 3, 4 and 5 recorded mean values of 2.3, 2.8, 2.8, 2.5, 2.5, and grand mean score of 3.5.

**Research Question Two:** What is the level of skill acquisition acquired?

**Table 2:** Mean and percentage of students' responses to research question two

S/N	Questionnaire Items	Total no. of Respondents	Total Score	SA	A	D	SD	Mean	Standard Deviation	DECISION
6	The rate of identification of chemicals is high on student taught in practical than student taught in lecture method.	282	902	58%	30%	11%	1%	3.2	9.57	Agree
7	Students taught in practical laboratory are independent of any body while students taught in lecture method are dependable on their teachers	282	781	49%	30%	15%	6%	2.8	8.32	Agree
8	Students taught in practical activity are more productive than that student taught in lecture method.	282	798	59%	21%	14%	6%	2.8	8.67	Agree
9	There is high level of competence among students taught with practical method unlike students taught with lecture method	282	682	41%	26%	21%	12%	2.4	8.16	Disagree
10	The students taught with practical laboratory are more creative than students taught with lecture method.	282	786	59%	8%	29%	4%	2.8	9.65	Agree
	<b>Grand mean</b>	282						<b>3.5</b>		<b>Accepted</b>

In table two, items 1, 2, 3, 4 and 5 recorded mean values of 3.2, 2.8, 2.8, 2.4, 2.8 and a grand mean of 3.5.

Research Question Three: What is the difference in the level of performance in chemistry of students exposed to practical activities and those taught in lecture method?

**Table 3:** Mean and percentage of students' responses to research question three (3)

S/ N	Questionnaire Items	Totalno. ofRespo ndents	Total Score	S A	A D	D S	Me D	Me an	Decis ion
1	The adoption of the subject is of high rate on the student taught with practical method unlike student taught with lecture method	282	654	43 %	18 %	25 %	14 %	2.3	Disagree
1	Student taught with chemistry laboratory identify chemical materials perfectly unlike student taught with lecture method	282	788	62 %	7 %	25 %	5 %	2.8	Agree
1	Student taught with chemistry laboratory interpret experimental data, unlike student taught with lecture method	282	784	56 %	23 %	13 %	8 %	2.8	Agree
1	Student taught with chemistry laboratory develop scientific reasoning unlike student taught in lecture method	282	708	44 %	21 %	27 %	8 %	2.5	Agree
1	Student taught with chemistry laboratory develop practical skills unlike student taught with lecture method	282	696	34 %	35 %	20 %	10 %	2.5	Agree
<b>Grandmean</b>		282						<b>3.2</b>	<b>Accepted</b>

In table three, items 1, 2, 3, 4 and 5 recorded mean values of 2.3, 2.8, 2.8 2.5, 2.5 and a grand mean of 3.2

#### IV. Discussion

From the research question one which sought to find out difference between the attitudinal changes of secondary school students exposed to practical activities and those taught using lecture method, the result of the data analysis showed that the students taught with practical in chemistry had the mastery of the subject and they are active in class in contrast to the students that were taught with lecture method. Udogu and Emendu (2017) discovered that practical activities have an impact on the chemistry laboratory exercises by familiarizing with students, helping to induce the scientific attitude to the student as well as helping the students to maintain interest in chemistry. From the findings of the study on research question two, which sought to find out the level of skill acquisition acquired, it was discovered that the students taught with practical method are independent, more productive, more competent and creative than the students taught with lecture method. Garba (2021) revealed from the findings of their study that teacher-centered teaching strategy was moderately suitable for enhancing skill acquisition among Office Technology and Management students of Kano State Polytechnics. From the analysis of the results obtained in table 3 for research question 3, students taught with practical method identify chemical materials, interpret experimental data, and develop scientific reasoning more than students taught with lecture method. Paul, Emmanuel, Emmanuel, Damoeroem and David (2021) discovered from the findings of their study that there was significant difference in the mean attitude scores towards physics students taught using the interactive students' notebook with feedback and those taught using the conventional strategy. Also, the work of Nneka and Zita (2020) reveal that there is significant difference between students exposed to practical activities and those taught in the conventional way.

#### V. Conclusion

The following conclusions were drawn from the findings of the study.

1. The students taught with practical method develop a mastery of the subject and there is active and effective teaching and learning in such class, more than the classes taught with lecture method.
2. Students taught with practical method are independent, highly productive and creative more than those taught with lecture method.
3. The students taught with practical method could identify chemicals, develop scientific reasoning, skills and could interpret experimental results more than those taught with lecture methods.

#### VI. Recommendations

Based on the results of the study, the researchers proposed the following recommendations which will be useful to educators, government, curriculum planners and all students and stakeholders in education in Imo state and Nigeria at large.

1. The government should fund the school effectively by providing the necessary infrastructural facilities and amenities needed by the schools to standardize teaching and learning process.

2. Government should employ more qualified administrators in other to take good decisions on the purchase of essential educational materials needed by the public schools in particular.
3. Curriculum planners should include excursion/field trips, science fair and quiz competitions in the school because students go by what they see, this will help influence their interest.
4. Teachers should expose the students in the benefits of teaching by utilizing whatever that is available within the school environment to help develop their interest and change their negative mindset about teaching profession.

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