



## Effectiveness of Learning Activity Package on Secondary School Biology Students' Interest in Akwa Ibom State, Nigeria

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### Abstract

This study investigate how effective learning activity package strategy is on Biology students' interest in Akwa Ibom State. Two research questions and two hypotheses formulated. Pretest-posttest non-randomized quasi-experimental design adopted. Population of 7,416 and sample size of 142 SS1 Biology students drawn with multi-stage sampling. Biology interest scale was the instruments with reliability coefficients of 0.79 obtained using Cronbach alpha (A). Descriptive statistics and Analysis of Covariance (ANCOVA) answered the research questions and test the hypotheses at .05 level of significance. Results showed that there is a significant difference between Biology students taught with learning activity package (LAP) and conventional method. Students taught with LAP had higher interest score. There is also a significant difference in the mean interest and achievement score of male and female Biology students taught using LAP in favour of the male. It was recommended that Biology teachers in Akwa Ibom State adopt LAP strategy.

### Introduction

Biology is a branch of natural science that deals with the study of living organisms, including their structures, functioning, evolution, distribution and interrelationships (Institute of Biology, 2016). Supporting these definition, Obikezie, *et. al.* (2022) explained that Biologists study the structure, function, growth, origin, evolution and distribution of living organisms. In order to realize the importance of biology the Nigerian Secondary School Biology Curriculum is designed to continue students investigation into natural phenomena, to deepen students ability to apply scientific knowledge to everyday life in matters of personal, community, health and Agriculture among others (Federal Ministry of Education, 2016). In spite of the importance and well set out learning experiences to encourage learning of Biology among students, the academic achievement of students in Biology has been poor (WAEC, 2019). The analysis of Biology students achievement in WASSCE shows that only 47.39%, 46.89%, 44.93%, 50.52% and 46.48% passed Biology at credit level in 2015, 2016, 2017, 2018 and 2019 respectively (WAEC, 2019).

One of the content areas of students' weakness and one of the likely causes of poor achievement in

biology is difficulty in understanding micro-organism (WAEC, 2019). This has implication for the current study as this study focus on content area of micro-organism. This poor performance and weaknesses in some content areas in biology may affect students' interest in biology and poor students' interest in biology could equally lead to poor performance.

Interest is a feeling of either 'like' or 'dislike' towards a particular type of activity over the other (Amedu, 2015). According to Derek (2018), there are several factors that usually influence the interest of students. Such factors include inappropriate and uninspiring teaching methods adopted by the teachers. Njoku and Akwali (2016) attributed the poor performance of students in sciences at WASSCE and NECO examinations to inappropriate teaching strategies adopted by many practicing classroom teachers. By implication, instructional methods and strategies adopted by teachers in schools for years seemed not to have been yielding the desired or expected results in terms of achievement and increased interest of students in biology, particularly as it affects biology students' academic achievement.



Therefore, the need to adopt an activity based instructional strategy like learning package instructional strategy. Learning activity package (LAP) is a student-centered activity-oriented teaching strategy where the teacher acts as a facilitator of learning, guiding the students through a series of activities and problems which may help learners to achieve highly. In LAP, learning materials are broken into small steps that are arranged sequentially from known to the unknown and in an increasing order of difficulty. Each student is expected to work at his own pace thus accommodating both the fast and slow learners (Okunade *et al.*, 2022). Neboh (2012) opines that Learning Activity Package is an innovative approach that acts as a vehicle that makes for individualization in learning. Likewise, Udu, (2018) stated that LAP is a booklet containing sets of learning assignments organized sequentially to achieve the specified objectives. In addition, it contains evaluation techniques to determine whether the objectives have been achieved or not (Galos and Gustilo, 2022). Neboh (2009) designed and conducted a study to determine the effectiveness of the learning activity package (LAP) in influencing students' achievement and retention in Senior Secondary School Biology. However, the study did not determine the effect of learning activity package on students' interest which this study investigated. Okunade *et al.* (2022) examined the effectiveness of learning activity package (LAP) on students' performance in Biology in Ekiti state secondary schools. The study showed that learning activity package (LAP) strategy is effective in improving performance and retention of Ekiti state secondary school students in Biology. This study again did not include the interest of students when exposed to Learning Activity Package, which this study investigated. Koocharoenpial, Mankaew and Lieagwanjarean (2023) research was to develop the learning activity package that enhance science experimental skills on the electrochemical cell from fruit juice for 9<sup>th</sup> grade students and study the implementation of the learning activity package consisting of comparing the students' science experimental skills between, before and after learning, and studying the students' science experimental skills comparing the mean score during learning with the 70% criteria of scores. The result showed that the quality of learning package verified by experts was at level of very good. However, the effect of Learning Activity Package on interest of students was not captured in this study. Udu and Eze (2018) conducted a study to examine the

impact of the utilisation of Learning Activity Package (LAP) in the classroom and its effect on urban and rural students' academic achievement in organic chemistry in Afikpo education zone of Ebonyi State. Results of data analysis revealed among others that, utilisation of learning activity package in the classroom had greater impact on the students' academic achievement in organic chemistry than the Lecture method. Furthermore, there was no significant difference in the academic achievement of urban and rural students in chemistry when taught with LAP. The result further shows that generally there is decline in the academic achievement of students. However, the effect of LAP on students' interest was not also considered. Gender is a moderator variable in this study.

In the process of learning science-based subjects, some researchers show superiority of male over female students and others show superiority of females over males. Adolphus and Ekineh (2019) described gender as a range of physical, mental and behavioural characteristics differentiating the masculinity and femininity of an individual. Ogunyebi (2018) opined that gender is not a significant factor to be associated with students' achievement if given equal opportunity with the right teaching and learning process, male and female students will achieve equally. The observations agree with Adepoju (2014) and Udoh (2015) which showed no significant difference in gender on students' academic achievement and retention in Biology when taught nervous coordination using computer simulation and charts. Udoh and Etiubon (2016) also found that there was no significant effect on gender with regards to students' achievement in science. On the contrary, Enohuean (2015) observed that there is a significant difference in the academic achievement and interest of male and female students exposed to the use of instructional method.

There has been a consistent poor academic achievement of students and declining interest in Biology as observed by WAEC Chief Examiners' Report (2019). Various efforts such as more time allocation to the teaching of biology, organizing extra moral lessons by various schools in biology, yet the problem of poor performance and lack of interest still persists. As such, this has become a major concern to Educators, Parents and other Stakeholders. This low interest has been attributed to the use of conventional method and inadequate use of instructional resources. Furthermore, most of the studies reviewed did not investigate the effect of Learning Activity Package on the interest of Biology students. It is on the basis of



these observations that the researcher poses the question, to what extent are the Learning activity package and lecture method effective in improving students' interest in biology? Based on the foregoing the present study examined the effectiveness of learning activity package and lecture method on students' achievement and interest in biology taking into consideration gender as the moderator variable.

### Research Questions

In order to guide the researcher in the study, the following research questions have been formulated:

1. What are the mean interest scores of Biology students taught micro-organisms using learning activity package and conventional lecture method?
2. What are the mean interest scores of male and female Biology students when taught micro-organisms using learning activity package instructional strategy?

### Hypotheses

To further guide the researcher in the conduct of this study, the following null hypotheses were tested at 0.05 level of significance.

Ho<sub>1</sub>: There is no significant difference in the mean interest scores of Biology students taught micro-organisms using learning activity package and conventional lecture method.

Ho<sub>2</sub>: There is no significant difference in the mean interest score of male and female Biology students when taught micro-organisms using learning activity package instructional strategy.

### Materials and Methods

This study employed a pretest-posttest non-randomized quasi-experimental research design. The population of this study comprised all 7,416 senior secondary one (SS1) Biology students in coeducational public secondary schools in the 2023/2024 academic session from two Senatorial Education Board of Akwa Ibom State, Nigeria.

The sample of this study comprised one hundred and forty two (142) senior secondary one (SS1) Biology students (male and female) in two (2) senatorial education board in Akwa Ibom state. Multi-stage sampling was used for the study as follows; simple random sampling technique was used to select two (2) Local Education committee (LEC) out of twenty five (25) in Akwa Ibom state through balloting. Purposive sampling technique was used to sample one (1) secondary school each from the sampled two (2)

secondary schools in each Local Education committee respectively.

The purposive sampling of the schools for the study was done using the following criteria;

- i. Schools that have qualified professional Biology graduates as subject teachers in SSS1 classes.
- ii. Schools with functional Biology laboratory.
- iii. Schools that are currently presenting candidates for the senior secondary school examinations (SSCE).
- iv. Government owned and co-educational secondary schools.

Simple random sampling technique was again used to assign the two (2) schools to experimental group 1 and 2 as control group through balloting. The following were obtained from each of the intact classes; in experimental group 1, the male students were thirty four (34) and the female students were thirty nine (39) while in the control group, the male students were thirty two (32) and the female students were thirty seven (37). In all, sixty six (66) males and seventy six (76) female Biology students were used for the purpose of analysis and discussion. At the end, a sample of one hundred and forty two (142) students were used for the study

The instrument for data collection was a researcher-made Biology Interest Scale in Microorganism (BIS). This is because poor achievement and students' weaknesses are more in the content area of micro-organisms where students view as difficult (WAEC, 2019). The Biology Interest Scale in Microorganisms (BIS) had 40-items constructed by the researcher to ascertain the students' level of interest in Microorganisms before and after teaching the concept with learning activity package instructional strategy and lecture method. A four point Likert scale of Strongly Agreed (SA), Agreed (A), Disagreed (D) and Strongly Disagreed (SD) was used. For positive worded items on the BIS, Strongly Agreed (SA) was scored 4 points, Agree (A) - 3 points, Disagree (D)-2 points and Strongly Disagree (SD) was the lowest with 1 point.

The instrument was given to two experts from Biology Education Department for face and content validity. To establish the reliability index of the instrument, Biology interest scale in Microorganisms (BIS) was trial tested and scores used to establish its reliability with forty (40) SS1 Biology students in a school of comparative status in the study area which did not take part in the main study. The BIS was subjected to Cronbach Alpha (A) and a reliability coefficient of 0.79 was obtained. Descriptive statistics was used to

answer the research questions and Analysis of Covariance (ANCOVA) for testing the hypotheses at 0.05 level of significance. Hypotheses were rejected

when the calculated p value was less than 0.05 level of significance, and was retained when the calculated p value was greater than 0.05.

### Results

**Table 1: Mean and standard deviation interest scores of Biology students taught micro-organisms using learning activity package and conventional lecture method**

Variables Learning Strategy	N	Pre-test		Post-test		Interest Mean Gain
		X	SD	X	SD	
LAP	73	26.21	4.58	46.93	9.33	20.72
Conventional method	69	26.26	5.21	34.95	4.76	8.69

Where N= Number of respondents,  $\bar{x}$ = mean, SD= Standard deviation, LAP= Learning activity package.

Table 1 showed that Biology students taught with learning activity package strategy had an interest pre-test mean score of 26.21 with a standard deviation of 4.58 and an interest post-test mean score of 46.93 with a standard deviation of 9.33. This difference between the pre-test and post-test interest mean for the learning activity package group was 20.72 which is the interest mean gain. For students taught with conventional method had interest pre-test mean score of

26.26 with a standard deviation of 5.21 and post-test mean score of 34.95 with a standard deviation of 4.76 and mean gain of 8.69. However, for each of the groups, the post-test interest means were greater than the pre-test interest means with the students taught Biology using learning activity package strategy having the highest interest mean gain. This result shows that learning activity package strategy increase students' interest more than conventional method.

**Table 2: Analysis of covariance (ANCOVA) of students' mean interest scores of Biology students taught micro-organisms using learning activity package and conventional lecture method**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	5272.229 <sup>a</sup>	3	1757.410	34.451	.000
Intercept	9775.215	1	9775.215	191.624	.000
PRE-TEST Strategy*	148.417	1	148.417	2.909	.090
Error	5136.472	203	25.298	50.345	.000
TOTAL	10355.510	207	50.027		
Corrected Total	360649.000	206	1750.723		

a. R Squared = .337 (Adjusted R Squared = .328).

The result in Table 2 shows that with respect to the interest mean scores of Biology students taught with learning activity package and conventional lecture method, an F-ratio of 50.345 was obtained with associated exact probability value of .000 Since the associated probability (.000) was less than 0.05 set as level of significance, the null hypothesis ( $H_{01}$ ) which

stated that there is no significant difference in the mean interest scores of Biology students taught Biology using learning activity package conventional lecture method is rejected. Thus, inference drawn is that there was a significant difference in the mean interest scores of Biology students taught Biology using learning activity package and conventional lecture method.



**Table 3: Mean and standard deviation of interest scores of male and female Biology students when taught micro-organisms using learning activity package instructional strategy**

Learning Strategy	Gender	N	Pre-test Xsd		Post-test Xsd		Interest Mean Gain
LAP	Male	34	26.70	4.10	50.97	9.42	24.27
	Female	39	25.79	4.97	43.41	7.79	17.62

Where N= Number of respondents,  $\bar{x}$ = mean, SD= Standard deviation, LAP=learning activity package.

Table 3 showed that male Biology students taught with learning activity package strategy had pre-test interest mean score of 26.70 with standard deviation of 4.10 and post- test interest mean score of 50.97 with standard deviation of 9.42 giving an interest mean gain of 24.27, whereas female Biology students taught with learning activity package strategy had pre-test and post-test mean scores of 25.79 and 43.41 respectively with standard deviation of 4.97 and 7.79 were obtained

respectively giving an interest mean gain of 17.62. This shows that the male students’ taught Biology using learning activity package strategy have higher interest mean than their female counterparts taught Biology using the same strategy. This result shows that gender seem to have some effects on students’ interest in Biology when taught using learning activity package strategy.

**Table 4: Analysis of covariance of mean interest scores of male and female Biology students taught micro-organisms using learning activity package instructional strategy**

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1073.575 <sup>a</sup>	2	536.787	7.219	.001
Intercept	3930.147	1	3930.147	52.854	.000
PRE-TEST	35.324	1	35.324	.475	.493
GENDER	990.207	1	990.207	13.317	.001
Error	5205.083	70	74.358		
TOTAL	167066.000	73			
Corrected Total	6278.558	72			

a. R Squared = .171 (Adjusted R Squared = .147).

The result in Table 4 shows that with respect to the interest mean scores of male and female Biology students taught with learning activity package strategy, an F-ratio of 13.317 was obtained with associated exact probability value of .001, since the associated probability (.001) was less than 0.05 set as level of significance, the null hypothesis ( $H_{02}$ ) which stated that there is no significant difference in the mean interest score of male and female Biology students when taught Biology using learning activity package instructional strategy was rejected. Thus, inference drawn is that there was significant difference in the mean interest score of male and female Biology students when taught Biology using learning activity package instructional strategy

**Discussion of Findings**

Result shows that biology students taught using learning activity package had higher interest mean gain than conventional method. This result shows that learning activity package strategy increase students’ interest more than conventional method in Biology. This also means that learning strategy may have some effects on students’ interest in Biology when taught using learning activity package. The corresponding hypothesis affirmed that there was a significant difference in the mean interest scores of Biology students taught using learning activity package and conventional method with those taught with learning activity package strategy having a higher interest mean gain than the conventional method. This finding is in agreement with the findings of Udu and Eze (2018) who conducted a study to examine the impact of the utilisation of Learning Activity Package (LAP) in the





classroom and its effect on urban and rural students' interest in organic chemistry. The result showed that there was a significant difference between the experimental and control group, with the mean interest scores of the learning activity package group being significant than the control group. The significant difference in the interest is not far-fetched that LAP provides the students the opportunity to grow in self-discipline, self-motivation and also presents occasions for genuine interaction between the teacher and students (Galos & Gustilo, 2022). In this study interest in Biology was high when students were taught using learning activity package strategy than other teaching strategy. The result showed that male students' taught Biology using learning activity package instructional strategy have higher interest mean than their female counterparts taught using the same strategy. This result shows that gender seem to have some effects on students' interest in Biology when taught using learning activity strategy. The corresponding hypothesis affirmed that there was significant difference in the mean interest scores of male and female Biology students when taught micro-organisms using learning activity package strategy with male students having higher mean interest gain which implies that gender is a significant factor affecting students' interest toward Biology when taught with learning activity package strategy. This finding is in agreement with Ricarda, Kleinert and Wilde (2022) who examined the influence of gender and interest as well as its interdependences on the students' use of learning strategies for biology learning and the results revealed a significant effect of gender on the students' use of the learning strategies rehearsal, organization, effort, and time management. On contrary Nwuba, Egwu, Awosika, Osuafor, (2023) conducted a study to investigate the effect of numbered heads together cooperative instructional strategy (NHT) on secondary school students' interest in biology in Awka Education Zone. Gender had no significant influence on students' interest in biology when taught using cooperative instructional strategy but this present study established that male had highest interest mean than the female when taught biology using learning activity package strategy.

### Conclusion

The study investigate the effect of learning activity package instructional strategy on secondary school Biology students' interest in Akwa Ibom State, Nigeria. Based on the findings, Biology students taught micro-organisms using learning activity package

strategy had a significantly higher interest mean gain than conventional method. The mean interest score of male was higher than the female Biology students when taught micro-organisms using learning activity package instructional strategy. In conclusion, learning activity package was seen to enhance biology students' interest significantly than lecture method.

### Recommendations

The following recommendations were made;

1. Biology teachers in Akwa Ibom State secondary schools adopt learning activity package (LAP) strategy since it enhances interest of the students.
2. Biology teachers should be trained and retrained on the job to adopt the use of learning activity package strategy in teaching Biology in the classroom.
3. Biology teachers should incorporate innovative instructional strategies, like learning activity package into their conventional teaching method to blend teaching and learning.

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