

# Evaluation of Yoruba- Biology Instructional Package on Achievement and Emotional Stability among Secondary School Students in Kwara State, Nigeria

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**Abstract:** The paper examined evaluation of Yoruba-Biology instructional package on achievement and emotional stability among secondary school students in Kwara State. Two objectives were formulated for the study, two research questions were raised to guide the study and two hypotheses were tested at 0.05 level of significance. The research adopted Quasi experimental design (pre-test, post-test and control group design). The population for this study consists of 124,723 with target population of 22,842 senior secondary students registered in the Biology Programme for the session 2022/2023 under the Kwara State Ministry of Education. 12,421 are male while 10,421 are female Biology students. A multi-staged sampling technique was used, the sample size consists of 286 students, 149 for the experimental group and 137 for the control group in a class setting. The validated instrument tagged Biology Achievement Test (BAT) with reliability co-efficient of 0.85 was used to collect data for the study shows that the instrument was reliable. The study revealed that the experimental group had higher mean gain than the control group. It also revealed that there was a significant difference in the mean achievement score of students taught ecology using Yoruba-Biology Instructional package and those taught using lecture method. The study concluded that the use of Yoruba-Biology Instructional Package would in no doubt improve the teaching and learning process in Biology. The study also recommended that teachers in secondary school should be encouraged by the school administrators and management to adopt the use of Yoruba-Biology Instructional Package to complement their teaching. This will enhance their teaching methods and provide them with supplementary materials for teaching.

**Keywords:** Evaluation, Biology, Yoruba, Instructional Package, Achievement, Emotional Stability

## I. Introduction

Education is one of the most important factors that have a direct relation to the development of the society from the beginning and will continue to do so for as long as society exists. The increasing awareness of the importance of education to the upliftment of the individual and societal standards has awakened in people and nations with a conscious effort at devoting their resources to acquiring qualitative education (Krieg, 2022). For instance, education is the tool used for the development of human being in cognitive, affective, psychomotor and psycho-productive domain which has become one of the most powerful weapons for reducing poverty and inequality as well as improving health and the general well-being of the individual. Thus, the rate of development in any society can be tied to the well-organized, managed and supervised education system which also serves as a tool for development in transforming the world into a global community through the advancement of Science and Technology (Flower, 2014).

It is the view of this research that variety of techniques, including the use of Information Communication Technology and other packages and resources can be useful in teaching and learning. Biology being the subject concerned with study of life and living organism is a branch of natural science and study of vital processes. Biology is a very important science subject and a requirement for further learning of a number of sciences related professional courses like medicine, Agriculture, Pharmacy and so on.

It is an economic subject that cut across other fields of learning, in this, Biology could be said to deal with understanding living tissues, organisms, their life and other related activities which cannot be put aside because of its importance to human well-being and existence. Biology is one of the major science subjects that senior secondary students offer at senior secondary school levels in Nigeria schools. Interestingly it is a popular science subject of choice among the students. The popular nature of Biology among other science subjects is attributed to it being relatively easier to learn than physics or chemistry (Abdullahi, 2016).

Biology learners at various levels of education are faced with a different challenges like inability to describe the structure of food web, number of pyramid, drawing and labelling structures very well, the concept of ecology, ecosystem, food chain, which are in ecology concept (Flower, 2014). Teachers' use of inadequate and monotonous way of exposing or imparting Biology to students using conventional strategy has also been identified as a factor hindering students' higher achievement and retention in Biology (Usman & Nwabueze, 2015).

Instructional package has been observed as a powerful strategy to bring about effective teaching and learning. The importance of quality and adequate instructional package in teaching and learning can occur through their effective utilization during classroom engagement. Instructional package here includes all the tools that the teachers can use to make the teaching and learning more interesting and memorable. The language used are of great importance to teaching of science most especially in Mathematics, Biology and related science subjects. (Bashir, 2018)

The integral nature of Biology demand that it is taught effectively and efficiently. This therefore implies that attention has to be given to instructional packages in order to bring about positive change in Biology education. This is because instructional packages are materials used by teachers and students to facilitate the teaching and learning process. Instructional package is defined as human and non-human materials, supports or aids that teachers use to engage learners in the classroom. Abolade (2014), stated that the instructional packages include projected and non-projected, print and non-print. These are instructional media for educating learners, more so, instructional package equipment's are necessary to provide and maintain the message. Instructional visual as the ability of displaying physical experience in demonstration so has to create curiosity, change behavior and retain knowledge. Visual aids are instructional media that deals with sense of sight.

The fall in standard of achievement in Biology is incontrovertibly according to Etukudo (2016), it is attributed to poor instructional package adopted by teachers in school. To support this assertion, Salau (2015), summited that many researchers have adduced that poor achievement in public examination is traceable to instructional package adopted by teachers. The resultant effect is the low achievement and low retention level in student outcome both in internal and external examination. This implies that mastery of Biology concept might not be fully achieved without using appropriate language of instruction. West African Examination Council (WAEC, 2019), Chief Examiner's report states that recurring persistence low achievement of students in Biology at Senior School Certificate examinations is no doubt the problem of ineffective and inappropriate language of instruction used by the Biology teachers for the teaching and learning of Biology. The results of the West African Examination Council (WAEC) revealed that achievement in Biology in the May/June Examinations have been on the decline. For instance, total number of students who sat for the examination in the 2019, the total percentage of candidate who attained credit level and above is 26% while 53.13% failed out rightly. Also, statistics for the National Examination Council (NECO) indicate that percentage fail in Biology for the year 2015, 2016, 2017 and 2018 were 45.77%, 48.73% and 71.00% respectively. Okeke (2014) stated that students' achievement has close link with teachers' language used. The researcher reiterated that teaching method adopted by the teacher could either enhance or deter students' achievement in Biology. Students' poor achievement could largely be attributed to poor language of instruction used.

Yoruba language is widely spoken in Nigeria particularly in Kwara State, although some are speaking Ebira and Tapa as well. The Yoruba language is widely spoken in Kwara, Oyo and Osun, Ondo, Ekiti, Ogun and Lagos State, it has tremendous influence. The use of the Yoruba language for classroom instruction in Biology might be relevant in addressing problems related to the students' understanding of Ecology Concept in the state. More so, many researchers' have proven that in classroom a mother tongue or local language rather than English language enrich students' understanding (Setati & Barwell, 2016; Charanchi, 2015)

The Yoruba-Biology Instructional Package was developed for learning of Ecology in Yoruba Language. The researcher used the platform of "Adobe Photoshop graphic design software to develop the package and inputted graphics, texts, audio material and animation via Macromedia fireworks, the designed graphic is taken to another software (Adobe flash). The window size used for this program was 800x600 pixel. The researcher in collaboration with a computer programmer inputted the content in the package.

Furthermore, an advantage in favour of Yoruba language use of computer is the availability of Yoruba style guide by Microsoft Corporation (2006) and Yoruba with development of upper case and lower case of special Yoruba characters are all available via the computer. This development has made use of computer and package in Yoruba language an easy task. Consequently, a research study like the present one on effects of Yoruba-Biology Instructional package on achievement, retention and emotional stability among students in Biology using the Yoruba language could be relevant. There are several Yoruba speakers not only within Nigeria, but across the globe that could benefit from the package.

The usage of computer, especially through the internet and the package in Yoruba language has a significant role to play in instructional delivery. This is because, the influence Computer has brought in the world, as observed Wokoma & Iheriohanma,

(2010) is evident in various areas of human endeavour (Cem & Akin, 2012). The learning materials used in the package consist of text, sound, video and graphic. In addition to the advantage of using the package medium of instruction, the use of flexible language of the immediate community of the learners, such as Yoruba language in preparing and presenting materials as was done in this research could further motivate the students.

Emotional stability is an essential ingredient for the student's growth and academic achievement. An emotionally stable student is far ahead of his counterparts who are emotionally unstable in many respects. Although that is the case, many school going individuals especially at the secondary school levels are highly emotionally unstable, and this is always a matter of concern to teachers and their academic achievement. According to Isangedighi (2017), emotion is an aroused state which is the product of the mind. When there is an emotional arousal, one observes bodily changes resulting from the activities of the brain and the autonomic nervous and endocrine systems. Though the involvement of the brain in emotional discharge is not so well understood, it is noted that emotion involves important interaction between the cortical and subcortical areas (Borod, 2016). Students who go to school need a level of emotional stability for functionality.

An emotionally disturbed student is a disadvantaged student in the school setting. It is therefore important that the growth process of the student is such that he/she grows up as an emotionally stable individual. Isangedighi (2017) considers that a person's psychological health has a significant impact on the type and amount of teaching and learning that person is capable of receiving. So, one's spread is position towards success or failure is moderated by his emotional status. Thus, an emotionally disturbed student cannot make much achievement in teaching and learning as a student who is emotionally stable (Stone & Rowley, 2018). While unstable emotion indicates poor academic performance, emotional stability indicates good academic performance. When faced with challenge or frustration, it is the positive academic achievement that would be able to respond appropriately.

To reduce distraction for purpose of effect, the teacher is expected to control the instructional package by playing it for a short time. This control could enhance learners' participation in the teaching and learning exercise. This is because instructional package could be an effective teaching and learning tool when learners are actively involved while viewing instructional package (Choi & Johnson, 2017). Active participation in watching of the package on the topic of instruction could arise their emotion and promote retention among students in order to improve their academic achievement. Based on this insight, the paper tends to evaluate the Yoruba-Biology instructional package on achievement and emotional stability among secondary school students in Kwara State.

## **II. Statement of the Research Problem**

Nigeria has made several attempts to improved and reform the standard of education at all level using the opportunity available with Information Communication Technology (ICT) in teaching and learning. The factors responsible for students' poor achievement and retention in Biology and other science subjects includes among others: the language of instruction and instrument used in teaching, teacher's qualification, family background, school environment, the curriculum, and the best language use while teaching due to difficulty in verbal and visual skills noticed among students (Hassan, 2014).

The decision of the language of instruction is another recurring issue in the improvement of excellent education in Nigeria. While many opted to teach in their students' native dialect. While others still consider the English language as the best medium for teaching any subject to any student (Popoola & Ajani, 2014). Although the importance of used of Mother-tongue for classroom instruction have been recognized (FRN, 2004) at least at the lower basic level in Nigeria. The use of more approachable language in teaching is important in tackling low achievement and retention in Biology since it opens up opportunities for new ways of teaching and learning.

Emotional stability has a significant impact on student achievement. When students are emotionally stable, they are better equipped to handle the challenges that come with learning and are more likely to perform well academically. Additionally, an instructional package that is designed to promote emotional stability can help create a positive and supportive classroom environment. This can lead to increased engagement and motivation among students, which can in turn improve their academic performance (Lindah, 2015).

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

The aim of the study is to assess the effects of using Yoruba-Biology instructional package on academic achievement, retention and emotional stability on secondary school Biology students in Kwara State. The objectives of the study are to;

1. Determine the effects of Yoruba-Biology Instructional Package (YBIP) on secondary school students' achievement in Ilorin, Kwara state.

2. Determine the effects of Yoruba-Biology Instructional Package (YBIP) on secondary school student's emotional stability in Ilorin, Kwara State.

### Research Questions

The following research questions were raised in the study;

1. What is the difference in the mean achievement scores of students when taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method?
2. What is the difference in the mean emotional stability of students when taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method?

### Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance.

**HO<sub>1</sub>:** There is no significant difference in the Mean ( $\bar{x}$ ) achievement score of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method.

**HO<sub>2</sub>:** There is no significant difference in Mean ( $\bar{x}$ ) emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method

### III. Review of Related Literature

Yaki (2014) carried out a study on effects of the Computer Aided Instructional Package (CAIP) and three-dimensional visuals on the performance of secondary school students in Biology. The design of this study is pretest posttest control group design. The participants of the study consist of 68 students; 24 in the experimental group 1, 24 in the experimental group 2 and control group has 20. The experimental group 1 received instruction via the computer aided instructional package (CAIP), experimental group 2 receives instruction via three dimensional visuals while the control group received instruction via the conventional method. The treatment lasted for four weeks. The instrument for data collection is Biology Achievement Test (BAT). The method of data analysis is one-way analysis of variance (ANOVA) and t-test. The result of the study reveals that there is a statistically significant increase in the achievements of experimental group 1 and experimental group 2 more than the control group. There were no gender effects in the two experimental groups. It was concluded that CAIP and three dimensional visual improve secondary school students' performance in Biology. It was recommended among others that workshop on production and utilization of instructional materials especially computer aided instructional packages and models should be organized for secondary school teachers. Hence, the present study will be carried out in Yoruba Language using instructional package is consequently relevant.

In a study to determine the implication of Teaching STB in the mother tongue (ESAN) for the learner raised and answer two hypotheses (Idialu, 2014). One hundred and twenty primary five pupils of ESAN speaking area were used for the study. Nine lessons were developed from the syllabus/scheme of work on energy and power. The researcher administered an achievement test in English language and in the mother tongue of the pupils to the control and experimental groups randomly assigned respectively. Data collected and analysed using t – test revealed that there was significant difference in the pupils' achievement in science when English and the mother tongue were used for instruction/evaluation in favour of the mother – tongue group. The researcher thus concluded from study and findings, that pupils are likely to be more comfortable and education brought closer to them with their mother tongue used as instruction medium. In this study, in addition to Yoruba language as mother tongue, the instructional package was further included considering the importance of information and communication technology and its use in the various fields of human endeavours.

Ilegar and Emmanuel, (1991) carried out a survey study on teacher's view on mother tongue use in the teaching of science. A sample of 124 randomly selected primary school teachers were drawn from different language – origin in Nigeria. The language included Hausa, Ibo, Yoruba, Urhobo, Ijaw, Isoko and Edo. At the end of the study, the researchers found that the teachers had positive views about mother – tongue use in teaching science. In furtherance for these studies the present study, which is on Yoruba and a quasi – experimental study will be use to carry out the study in Kwara state.

Wushishiet *al.* (2016) conducted a study on the role of English language in science students' failure in senior secondary school certificate examinations in Minna metropolis, Niger state. In the study, randomly sampled 240 respondents – comprising Eighty (80) science students, eighty (80) parents and eighty (80) science teachers were used to respond to the three-instrument used. Six research questions and two hypotheses raised were analysed by the researchers and result obtained showed that majority of the respondents agreed that English language is a factor that affects science students' failure in senior secondary school certificate

examination (SSCE). Consequently, the researchers recommended that indigenous language should be encouraged for teaching science in secondary schools; hence, the present study will be carried out in Yoruba language is consequently relevant.

Morrinet *et al.* (2014), conducted a survey study in Zimbabwe on impact of medium of instruction on the performance of two Grade 6 classes. The researchers collected data through document analysis, interviews and lesson observations. The result of the study as reported by the researchers revealed that learners learn better and benefit more from the education system if the medium of instruction is the same language they use at home. Using a different research design and in Nigeria, similar study will be conducted by this researcher.

Bashir (2018) conducted a study on assessment of web-based instructional package in Hausa Language on students' achievement in Niger state. The study considered students of upper basic level of education, from seven Educational Zones of Niger State, Nigeria. The population for this study consisted of 172,511, while the target population was 56,651 Junior Secondary School class two (II) students in Niger State, which comprised of 34,104 males and 22,543 females 2014/2015 academic session were used for the study. The Junior Secondary School (JSS II) was specifically selected because the Geometric concepts used for the study are covered under this level of Basic Education. Using a different instructional package in Yoruba language, similar study will be conducted by this researcher.

#### **IV. Methods**

##### **Research Design**

The research design that was adopted for this study is quasi experimental design (pre-test, post-test and control group design). The quasi-experimental design is similar to true experiments, is a research design that aims to identify the causal relationship between an independent and dependent variable.

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

The population for this study consisted of all public senior secondary in Kwara State. The target population was 22,842 senior secondary school one students who have registered in the Biology programme for the session 2022/2023 under the Kwara State Ministry of Education. 12,421 are male, while 10,421 are female Biology students listed showing the population of schools and students offering Biology.

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

The sample for this study consisted of 286 respondents made up of 159 males and 127 females drawn from 6 secondary schools in Kwara State. Based on the nature of this research, three stages Random sampling techniques was used.

##### **Research Instruments**

The instrument used for the study are; treatment instrument, test instrument and questionnaire.

##### **Reliability of the Instrument**

The score from BAT used in the school was used to determine the reliability of the YBIP. The researcher found a co efficient of 0.85 using the Statistical Package for Social Sciences (SPSS), version 23.0. This indicated that the BAT was appropriate for the data collection.

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

The data generated were analysed using descriptive statistics, usually mean and standard deviation and Analysis of Co-Variance (ANCOVA). The bench mark is 2.50. Mean, and standard deviation were used to answer the research questions and hypotheses. Statistical Package for Social Sciences (SPSS), version 23.00, was used throughout the analysis, and the significance of the statistical analysis was ascertained at 0.05 alpha level of significance.

#### **V. Results**

##### **Research Question One**

What is difference in the mean achievement scores of students when taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method?

To answer research question one, mean and standard deviation was used to analyse the pretest and post test scores of students as shown in Table 1.

Table 1: Mean and Standard Deviation of Pre-test and Post-test Scores of Students Taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method

Group	N	Pre-test		Posttest		Mean Gain
		Mean	SD	Mean	SD	
Experimental group	149	9.23	2.70	14.54	2.72	5.31
Control group	137	9.18	2.58	10.39	3.06	1.21

Table 1 shows the mean and standard deviation of pre-test and post-test scores of students taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method. The experimental group had achievement mean score of 9.23 with a standard deviation of 2.70 at the pre-test while the control group had achievement mean score of 9.18 with a standard deviation of 2.58. The experimental group had achievement mean score of 14.54 with a standard deviation of 2.72 at the posttest while the control group had achievement mean score of 10.39 with a standard deviation of 3.06. Mean gain scores of 5.31 and 1.12 for the experimental group and control group respectively, this indicates that experimental group achieved higher than control group.

### Research Question Two

Does the students possess more emotional stability when taught ecology using the Yoruba-Biology instructional package than those taught using conventional method?

To answer research question five, mean and standard deviation was used to analyse the emotional stability of the students as shown in Table 2

Table 2: Mean and Standard Deviation of students on emotional stability when taught Ecology using the Yoruba-Biology instructional package than those taught using conventional method

Group	N	Mean	SD
Experimental group	149	2.76	0.52
Control group	137	2.46	0.45

Table 2 showed the emotional stability of students when taught Ecology using the Yoruba-Biology instructional package than those taught using conventional method. The result showed that the experimental group mean score is 2.76 and standard deviation is 0.52. The control group mean score is 2.46 and standard deviation is 0.45. The result showed that the experimental group have higher emotional stability than the control group.

### Hypothesis One

There is no significant difference in the mean achievement score of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method.

The result is presented in Table 3.

Table 3: ANCOVA of mean academic achievement scores of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1264.14 <sup>a</sup>	2	632.07	76.75	0.00
Intercept	2701.65	1	2701.65	328.06	0.00
Pretest	39.19	1	39.19	4.76	0.03
Teaching methods	1221.06	1	1221.06	148.27	0.00

Error	2330.57	283	8.24		
Total	48658	286			
Corrected Total	3594.713	285			

The result in Table 2 shows the ANCOVA of mean academic achievement scores of students taught ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The result revealed that the F-ratio of 148.27 with 1 degree of freedom and p-value of 0.00 was obtained for academic achievement scores of students taught ecology using Yoruba-Biology Instructional Package and those taught using conventional method, since the p-value of 0.00 is less than 0.05 level of significance. This indicate that there was a significant difference in the mean achievement score of students taught ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The null hypothesis is therefore rejected.

### Hypothesis Two

There is no significant difference in emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method.

The result is presented in Table 4.

Table 4: t-test analysis of emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method

Group	N	Mean	Std. Deviation	T	Df	Sig. (2-tailed)	Mean Diff	Std. Error Diff
ExperimentalGroup	149	2.76	0.52	5.28	284	0.00	0.30	0.06
Control Group	137	2.46	0.45				0.30	0.06

The result in Table 4 showed the t-test analysis of emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The result revealed that the t-calculated of 5.28 with 284 degree of freedom and p-value of 0.00 was obtained for emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method, since the p-value of 0.00 is less than 0.05 level of significance. This indicate that there was a significant difference in emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The null hypothesis is therefore rejected.

### V. Discussion of findings

The findings on research question one as regards to difference in the mean achievement scores of students when taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method revealed that the experimental group had higher mean gain than the control group when taught Ecology using Yoruba-Biology Instructional Package (YBIP) and those taught using conventional method.

The analysis also indicates that there was a significant difference in the mean achievement score of students taught ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The study concur with Cem& Akin (2012), they carried out a study using 6<sup>th</sup> grade students on effects of instructional package on the Biology achievements, attitudes, anxiety, and mathematical self – efficacy. The results of findings revealed from the study using Mann – Whitney U test indicated a statistically significant difference between the groups in favour of instructional package as against the Traditional Biology Instruction TBI.

The findings on hypothesis five showed that there was a significant difference in emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The study concur with Bala and Apagu (2014) they conducted a study on mixture of English and Nigerian language to determine the effect of language of teaching on achievement in biological concepts of secondary school students (Upper Basic) in Hawul, Borno State, Nigeria. The result collected at the end of the study was analysed using t-test of independent sample to compare the means and the result found by the researchers indicated that those taught the biological concepts in English/Hawul performed significantly better than those expected to the lessons with the English only medium.

### VI. Conclusion

Findings of this study has revealed that students taught with Yoruba-Biology Instructional Package (YBIP) perform better than those taught with conventional methods and there is significant difference between mean achievement score of students taught with Yoruba-Biology Instructional Package (YBIP) and conventional methods. There is significant difference in emotional stability of students taught Ecology using Yoruba-Biology Instructional Package and those taught using conventional method. The use of Yoruba-Biology Instructional Package when it is well tailored would in no doubt improve the teaching and learning process in Biology.

## **VII. Recommendations**

Based on the findings of the study, the following recommendations were made;

- i. Biology Teachers in secondary school should be encouraged by the school administrators and management to adopt the use of Yoruba-Biology Instructional Package and other instructional packages to complement their teaching. This will enhance their teaching methods and provide them with supplementary materials for teaching.
- ii. Ministry of education and education board should make provision for continuous sensitizations, trainings and workshops for teachers in secondary schools. This will further encourage them to engage in the use of mother tongue language for teaching.

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