



THE USE OF PROJECT-BASED LEARNING (PBL) METHOD IN IMPROVING SS1 STUDENTS' PERFORMANCE IN READING COMPREHENSION IN BENUE STATE, NIGERIA

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Abstract

The purpose of the study was to investigate the effect of using Project-Based Learning (PBL) method in improving SS1 students' performance in reading comprehension in Benue State, Nigeria. Three research questions were answered and six hypotheses were tested at 0.05 level of significance. The study adopted quasi-experimental, pre-test, post-test, non-equivalent, non-randomised research design. A sample of 73 Senior Secondary One (SS 1) students was obtained from the population of 3,925 students using multi-stage sampling technique. Data were collected using Reading Comprehension Performance Test (RCPT). The RCPT had the reliability coefficients of 0.76 using Kuder Richardson (K-R 20). Data were analysed using mean and standard deviation to answer the research questions and analysis of covariance (ANCOVA) to test the hypotheses. The findings showed significant difference between the mean performance scores of students taught reading comprehension using Project-based Learning (PBL) method and those taught using conventional method in favour of the former. There was no significant difference between the mean performance scores of male and female students taught reading comprehension using Project-based Learning (PBL) method. There was no significant difference between the mean reading performance scores of male and female students taught reading comprehension using the conventional method. It is concluded that project-based learning method improves students' performance in reading comprehension more than the conventional method. Project-based learning method does not have differential effect on male and female students' performance in reading comprehension. The conventional method does not have differential effect on male and female students' performance in reading comprehension. Based on the findings, it was recommended among other things that teachers of English Language should adopt project-based learning method in helping students to improve their reading comprehension skills.

Keywords: Project-Based Learning, reading comprehension, performance, English Language.

Introduction

English language is a second language in Nigeria. It is used as a medium of instruction in schools. The English Language teacher aims to develop four main skills namely, listening, speaking, reading and writing. Reading and listening are the receptive skills while writing and speaking are the productive skills. This study focuses on reading.

Reading is a meaning construction process that involves obtaining information from print. It is also a thinking process which involves bringing of meaning to and taking of meaning from the printed page (Ari, 2017). Kozak (2011) describes reading as the complex interaction between a text and a reader for the purpose for reading, which are shaped by the reader's prior knowledge and experiences. Oyetunde (2009) defines reading as the ability to take information from print or is the ability to make sense of the content of what is being read. Reading without comprehension is not complete. It therefore means that reading is a meaning making process. Thus, it goes beyond being able to pronounce words from the print.

Reading is one among the four skills that learners need to master because it introduces them to new vocabulary, material and knowledge that can be used with other language skills (Grabe & Stoller, 2011). Anderson (2012) asserts that good readers have very high success in writing, listening, and speaking tasks in the 21st century. This is because they have gained input and developed their reading ability through extensive reading. Therefore, it is crucial that students master their English reading ability both intensively and extensively for effective global communication.

Research has identified obstacles to students' effective reading. Some of these include lack of inferential and critical skills, meta-cognitive skills, limited vocabulary, poor recall, inability to identify main ideas and supporting ideas (Muodumogu & Iorpev, 2018). Such reading difficulties may result to students' poor performance. Muodumogu (2012) asserts that an alarming percentage of learners in Nigerian schools are unable to read; those who can read are unable to use the skill for learning. The West African Examinations Council Chief Examiners' report shows that students perform poorly in the

West African School Certificate Examinations (WAEC, 2020) due to their inability to read and comprehend. The weaknesses are blamed on lots of factors like teaching methodology, teacher factors, parental factors including students' factors (Muodumogu, 2012; Ukume, Agbum & Udu, 2018). There is therefore, the need to adopt instructional strategies that could develop students' reading comprehension skills.

For a reading class, Grabe and Stoller (2013) suggest a class project, besides oral presentation and examinations, as one of the valuable means of reading activities in class. An instructional tool that would suit this suggestion is Project-Based Learning (PBL) method. This method seems to be one of the most appropriate teaching tools that connect language skills and content knowledge.

Project-based Learning (PBL) is a teaching method in which students learn by actively engaging in real-world and personally meaningful projects. It is a teaching method in which students' gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging and complex question, problem or challenge (Bradley-Levinc, 2013). PBL method is a student-centered pedagogy that involves a dynamic classroom method in which students acquire a deeper knowledge through active exploration of real-world challenges and problems (Matsuda, 2012). It is a method of active learning and inquiry-based learning. PBL contrasts with paper-based, rote memorization, or teacher-led instruction that presents established facts or portrays a smooth path to knowledge by posing questions, problems or scenarios. Markham (2011) describes project-based learning (PBL) as method that integrates knowing and doing. Students not only learn knowledge and elements of the core curriculum, but also apply what they know to solve authentic problems and produce results that matter. For example, in a reading comprehension lesson, students should be able to be critical in order to identify the direction to which the content of the passage intends to flow and thus have the background knowledge of the comprehension passage.

Project-based Learning method has been advocated as a successful approach in English as a

Second Language (ESL) classrooms especially in reading comprehension. Much research support PBL as a suitable teaching method (Lenz, Wells & Kingston, 2015; Larmer, Mergendoller, & Boss, 2015). It is also a potential means of teaching reading due to its integration of knowing, doing, and applying what students know to solve problems (Markham, 2011). Thus, this method could help students understand better with improved performance.

Performance generally implies the accomplishment of a given task measured against present known standards of accuracy and competences. The term academic performance refers to how well a student does in school (Akpakwu, 2014). Academic performance also refers to how students deal with their studies and how they cope with or accomplish different tasks given to them by their teachers. From this view, academic performance generally means how students are accomplishing their tasks and studies. Bui and Bui (2017) assert that students' performances are the cognitive representation in scores or grade. This is because students differ in terms of intellectual abilities. Imam (2016) asserts that students differ in terms of intellectual abilities. While some are above average, some are of average intelligence and some are dull. Some students exhibit differences in terms of verbal reasoning, numerical ability, clerical speed and accuracy, language usage, space relation and mechanical reasoning. Imam (2016) states that students reading abilities are often grouped into three according to performance levels: frustration, instructional and independent. A student operating at the independent level needs no help from the teacher. Such a student is able to read the text for pleasure, and between the lines. At the instructional level, the student needs the teachers' help. This help is important in students' attempt to read along the lines. It is also referred to as the ideal level. The frustration level implies that no amount of help from the teacher will enable the pupil to comprehend the text. The text is too difficult for pupils at this level to process. In a study by Oyetunde in Imam (2016) on how secondary students' process print, findings showed that majority of the readers were at the frustration level using narrative expository texts.

Considering students' differences in their abilities and performance levels, it is necessary that teachers should organize them into small groups in such a way that instruction is provided on a small level that benefits each student.

Researches abound on the effect of PBL in other locations (Shiraz and Larsari, 2014; Rocha, 2017; Somani & Rizvi, 2018). Shiraz and Larsari (2014) carried out a study on the effect of project-based activities on intermediate English as a Foreign Language (EFL) students' reading comprehension ability in Guilan, Iran. The result indicated that there is a significant positive relationship between the use of Project-based activities and reading comprehension ability. Barr and Chinwonno (2016) conducted a study on the effects of project-based reading instruction on English reading ability and inter-cultural communicative competence of undergraduate students in Thailand and reported that students' scores from both tests had increased significantly through the use of the Project-based Reading Instruction.

Furthermore, Rocha (2017) studied project-based learning in reading at a Colombian public school. The exploratory study investigated the influence of project-based learning (PBL) in tenth grade students' reading processes to enhance comprehension through the application of specific skills. Findings revealed that with PBL the development of students reading comprehension skills had impact in higher performing students but a minor impact with lower performing ones.

Another factor that may influence students' performance is gender. Gender is a factor that may influence students' attitude to and performance in reading. It refers to the roles and responsibilities of men and women in families, societies and culture. According to Yang (2014), gender refers to the social attributes and opportunities associated with being male or female and the relationships between women and men; females and males, as well as the relations between women and those between men. These attributes, opportunities and relationships are socially constructed and are learned through socialization processes. Regarding the effect of gender on students' performance in reading, Arellano (2013)

conducted a research on differences between female and male students' achievement in reading comprehension in English as a Foreign Language of Spanish Compulsory Secondary Education in Spain. The result showed that female students obtained better global result than their male partners.

Jefi (2015) investigated gender differences in reading comprehension achievement at Islamic Institute Syekh Nurjati Cirebon, Indonesia. Findings showed that girls performed better than boys in reading comprehension. Madoda (2016), Ala, Oda and Abdul-Kadhim (2017) showed that there are no statistically significant differences between the two groups of gender on reading comprehension. Magon (2019) is of the opinion that female students are better than the male students in academic performance. However, Okoro (2011) contends that male students achieve higher than their female counterparts. Nzewi (2014) and Okeke (2007) are of the view that females achieve as high as their male counterparts when given equal opportunities. It is against this background that the study seeks to examine the effect of Project Based Learning (PBL) method on SSI students' attitude and performance in reading comprehension in Konshisha Local Government Area of Benue State.

Statement of the Problem

The ability to read and understand is a vital determination of success in any academic endeavour. It is therefore essential for students to know how to read as their success in school depends on this. Sadly, over the years, the ability of secondary school students to read and comprehend has been unsatisfactory. This worrisome development has translated to poor academic performance in English Language and other subjects in the school curriculum since reading is core in learning. Despite the steps taken by scholars to ameliorate this problem through viable research, this disturbing status quo still persists. The West African Examination Council chief examiners' report shows that students perform poorly in West African school Certificate Examination (WAEC, 2020) due to their inability to read and comprehend. Muodumogu (2012) adds that an alarming percentage of learners in

Nigerian schools are unable to read; those who can read are unable to use the skill for learning which Muodumogu (2012), Ukume, Agbum and Udu (2018) asserted is majorly caused by the use of defective teaching methods.

From the foregoing, it is obvious that the problem of poor performance in reading comprehension has persisted for long. Although scholars have identified a number of possible causes, the unanimous emphasis on poor instructional method used by teachers seems to be central. Simply put, the conventional method has not been able to cater for the learning of students. It is against this backdrop that this study investigated effects of project-based learning method on SSI students' performance in reading comprehension in Benue State, Nigeria.

Research Questions

The following research questions guided the study:

1. What is the difference between the mean performance scores of students taught reading comprehension using Project-based Learning (PBL) method and those taught using conventional method?
2. What is the difference between the mean performance scores of male and female students taught reading comprehension using Project-based Learning (PBL) method?
3. What is the difference between the mean performance scores of male and female students taught reading comprehension using the conventional method?

Hypotheses

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

1. There is no significant difference between the mean performance scores of students taught reading comprehension using Project-based Learning (PBL) method and those taught using conventional method.
2. There is no significant difference between the mean performance scores of male and female students taught reading comprehension using Project-based Learning (PBL) method.

3. There is no significant difference between the mean reading performance scores of male and female students taught reading comprehension using the conventional method?

Research Method

The study employed a quasi-experimental, non-randomized, pre-test, post-test, non-equivalent, control group design in Konshisha Local Government Area of Benue State, Nigeria. The population for this study consisted of 3,925 Senior Secondary School One (SS1) students in 71 secondary schools during the 2021/2022 academic session (Benue State Examinations Board, Makurdi, 2022). The sample was 73 (male and female) Senior Secondary One (SS1) students from two intact classes from two schools obtained using multi-stage sampling.

Reading Comprehension Performance Test (RCPT) consisted of instructions and two passages, A and B. The students were instructed to indicate their gender, read two passages and answer 20 items on the passages. Each passage comprised of 10 multiple choice questions. The questions were at literal, inferential and critical levels of reading comprehension. Moreover, the items tested students' performance in identifying the title of the passage and providing suitable words to replace given words in the passages. The passages were adopted from the West African Examinations Council (WAEC) and were in line with the SS1 reading comprehension curriculum. The researcher adapted a marking guide for the RCPT from the West African Examinations Council. This was used for marking the RCPT. The test was scored out of 20 marks. One mark was allocated to each correct answer to a maximum score of 20 marks.

The researcher adopted six comprehension passages, two from New Oxford English text book 1, two from Complete English Course for Senior Secondary Schools and two from New Concept English for Senior Secondary Schools 1 and planned 12 lessons for teaching reading comprehension. The lesson plans were based on SS1 reading comprehension curriculum. Six of the lesson plans were used to teach the experimental group using project-based learning

method. The six other lesson plans were used to teach the control group using the conventional method. The skills taught were atliteral, inferential and critical levels of reading comprehension.

The instrument was validated by three experts, two in English Language Education from the Department of Arts and Social Sciences Education and one expert in Measurement and Evaluation from the Department of Educational Foundations all from Benue State University, Makurdi. All corrections and observations were effected in order to improve validity of the instruments.

A trial test was conducted in one day on 40 senior secondary I students. The test scores RCPT were analysed using Kuder Richardson 20 (K-R 20) and not Kuder Ricardson 21 because the later assumes that all the items have the same difficulty level (Sarmah & Hazarika, 2012). The RCPT yielded a reliability coefficient of 0.76.

The researchers collected data with the aid of English Language education teachers who were teaching English Language in SS1 in the sampled schools. Reading Comprehension Performance Test (RCPT) was administered to all the students who participated in the study at pre-test to ascertain their performance in reading comprehension. Treatment in the experimental group and lessons in the control group held once a week and each lesson lasted for 80 minutes. The experimental group was exposed to six lessons using project-based learning method within six weeks. Each lesson was taught in eight steps namely, introduction which comprised of purpose setting questions. Other steps were creation of project groups, sharing group comprehension tasks, reading and discussion of project tasks and presentation of project report. The lesson plans also contained steps for evaluation, summary/conclusion and assignment. The control group was exposed to six lessons within six weeks using the conventional method. Each lesson was presented in the following order: students were exposed to reading a given passage and answering questions at literal, inferential and critical levels of comprehension. After teaching for six weeks, the instruments were modified and administered during post-test. Mean and standard deviation

were used to answer the research questions. The hypotheses were tested at 0.05 level of significance using Analysis of Co-variance (ANCOVA).

Results

Data analysis, interpretation and discussion of findings

Research Question 1

What is the difference between the mean performance scores of students taught reading comprehension using Project-based Learning (PBL) method and those taught using conventional method?

Table 1: Mean Performance Scores of Students Taught Reading Comprehension Using Project-based Learning Method and those Taught Using Conventional Method

Method	N	Pre-test		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Project-based Learning Method	42	12.76	1.12	17.83	1.38	5.07
Conventional Method	31	12.71	1.22	14.65	1.68	1.94
Mean Difference		0.05		3.18		3.13

Table 1 shows the mean performance scores of students taught reading comprehension using project-based learning (PBL) method and those taught using the conventional method. The table reveals that the pre-test mean performance scores of students taught reading comprehension using PBL method was 12.76 with standard deviation of 1.12 and the post-test mean score was 17.83 with standard deviation of 1.38, while the mean performance scores of students taught reading

comprehension using the conventional method was 12.71 in the pre-test with standard deviation of 1.22 and 14.65 in the post-test with standard deviation of 1.68. The difference in the mean attitude ratings of students taught reading comprehension using PBL method and those taught using the conventional method was 3.13 in favour of students taught reading comprehension using PBL method.

Research Question 2

What is the difference between the mean performance scores of male and female students taught reading comprehension using Project-based Learning (PBL) method?

Table 2: Mean Performance Scores of Male and Female Students Taught Reading Comprehension Using Project-based Learning Method

Gender	N	Pre-test		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Male	16	12.81	1.28	17.69	1.40	4.88
Female	26	12.73	1.04	17.92	1.38	5.19
Mean Difference		0.08		0.23		0.31

Table 2 shows the mean performance scores of male and female students taught reading comprehension using project-based learning (PBL) method. The table reveals that the pre-test mean performance scores of male students taught reading comprehension using PBL method was 12.81 with standard deviation of 1.28 and the post-test mean performance score was 17.69 with standard deviation of 1.40, while the mean

performance score of female students taught reading comprehension using the project-based learning method was 12.73 in the pre-test with standard deviation of 1.04 and 17.92 in the post-test with standard deviation of 1.38. The difference in the mean performance scores of male and female students taught reading comprehension using PBL method was 0.31 in favour of female students.

Research Question 3

What is the difference between the mean performance scores of male and female students taught reading comprehension using the conventional method?

Table 3: Mean Performance Scores of Male and Female Students Taught Reading Comprehension Using Conventional Method

Gender	N	Pre-test		Post-test		Mean Gain
		Mean	SD	Mean	SD	
Male	18	12.94	0.80	14.83	1.65	1.89
Female	13	12.38	1.61	14.38	1.76	2.0
Mean Difference		0.56		0.45		0.11

Table 3 shows the mean performance scores of male and female students taught reading comprehension using conventional method. The table reveals that the pre-test mean performance scores of male students was 12.94 with standard deviation of 0.80 and the post-test mean performance score was 14.83 with standard deviation of 1.65, while the mean performance score of female students taught reading

comprehension using conventional method was 12.38 in the pre-test with standard deviation of 1.61 and 14.38 in the post-test with standard deviation of 1.76. The difference in the mean performance scores of male and female students taught reading comprehension using the conventional method was 0.31 in favour of female students.

Hypothesis 1

There is no significant difference between the mean performance scores of students taught reading comprehension using Project-based Learning (PBL) method and those taught using conventional method.

Table 4: ANCOVA of Performance Scores of Students Taught Reading Comprehension Using Project-Based Learning Method and those Taught Using Conventional Method

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Model	20043.742 ^a	3	6681.247	3733.804	.000	.994
Pretest	37.673	1	37.673	21.053	.000	.231
Method	216.103	2	108.052	60.385	.000	.633
Error	125.258	70	1.789			
Total	20169.000	73				

a. R Squared = .994 (Adjusted R Squared = .994)

Table 4 shows that $F(2, 70) = 60.385$, $P = 0.000 < 0.05$, partial eta squared = 0.633. The null hypothesis is rejected. This implies that there is significant difference in the mean performance scores of students taught reading comprehension using project-based learning method and those taught using the conventional method. Thus, it can be concluded based on the evidence from data analysis that the mean performance scores of

students taught reading comprehension using project-based learning method was significantly higher than those of students taught using the conventional method. The partial eta squared of 0.633 was obtained for the strategies meaning that 63.3% of the students' mean performance scores can be attributed to the methods employed in the teaching of reading comprehension.

Hypothesis 2

There is no significant difference between the mean performance scores of male and female students taught reading comprehension using Project-based Learning (PBL) method

Table 5: ANCOVA of Performance Scores of Male and Female Students Taught Reading Comprehension Using Project-Based Learning Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	19.826 ^a	2	9.913	6.665	.003	.255
Intercept	31.327	1	31.327	21.062	.000	.351
Pretest	19.277	1	19.277	12.960	.001	.249
Gender	.807	1	.807	.542	.466	.014
Error	58.007	39	1.487			
Total	13435.000	42				
Corrected Total	77.833	41				

a. R Squared = .255 (Adjusted R Squared = .217)

Table 5 shows that $F(1, 39) = 0.542$, $P = 0.466 > 0.05$, partial eta squared = 0.014. The null hypothesis is not rejected. This implies that there is no significant difference in the mean performance scores of male and female students taught reading comprehension using project-

based learning method. The partial eta squared of 0.014 was obtained for gender meaning that only 1.4% of students' mean performance scores can be attributed to their gender difference in reading comprehension when exposed to project-based learning method.

Hypothesis 3

There is no significant difference between the mean reading performance scores of male and female students taught reading comprehension using the conventional method.

Table 6: ANCOVA of Performance Scores of Male and Female Students Taught Reading Comprehension Using the Conventional Method

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	18.753 ^a	2	9.377	3.957	.031	.220
Intercept	10.970	1	10.970	4.630	.040	.142
Pretest	17.233	1	17.233	7.273	.012	.206
Gender	.058	1	.058	.025	.877	.001
Error	66.344	28	2.369			
Total	6734.000	31				
Corrected Total	85.097	30				

a. R Squared = .220 (Adjusted R Squared = .165)

Table 6 shows that $F(1, 28) = 0.025$, $P = 0.877 > 0.05$, partial eta squared = 0.001. The null hypothesis is not rejected. This implies that there is no significant difference in the mean performance scores of male and female students taught reading comprehension using conventional method. Thus, from data analysis, the mean performance scores of female students was not significantly higher than those of male students taught reading comprehension using conventional method. The partial eta squared of 0.001 was obtained for gender meaning that only 0.1% of students' mean performance scores can be attributed to their gender difference in reading comprehension when exposed to conventional method.

Discussion of Findings

This study investigated effects of project-based learning method on senior secondary one (SS1) students' performance in reading comprehension in Benue State. The finding on research question one and hypothesis one shows that there is significant difference between the mean performance scores of students taught reading comprehension using project-based learning method and those taught using the conventional method. This finding is consistent with Shiraz and Larsari (2014) who found that there is significant positive relationship between the use of project-based learning method and students' reading comprehension ability. The finding is also in line with Barr and Chinwono (2016) whose study revealed that project-based learning method significantly improved students' reading comprehension. The finding is in agreement with Rocha (2017) who found that project-based learning method significantly improved the reading comprehension skills of higher performing students. The finding also agrees with Somani and Rizvi (2018) who investigated the effect of project-based learning method and traditional method in language teaching and found that project-based learning method significantly improved students' language performance than the traditional method. This finding is justifiable on the fact that project-based learning method provided productive environment for the students to develop their meta-cognitive skills which enhanced their

performance in reading comprehension. The method also enabled the students to develop cooperative, creative, critical thinking and problem-solving skills. Project-based learning method enables students to work in small groups on academic tasks. The task can be in the form of investigation or research on a particular topic. The topic being studied usually integrates concepts from a number of disciplines or fields of study. Students in the same small group cooperate with one another to reach a collective outcome over a period of time. This is done by asking and refining questions, expressing ideas, making predictions, collecting and analyzing data, reaching conclusions, and communicating their findings to others. Project-based learning is an instructional method centered on the learner. Students develop a question and are guided through research under the teacher's supervision.

The result on research question two indicates that female students taught using project-based learning method performed better in reading comprehension than their male counterparts. Result obtained from testing hypothesis two, however, shows that there is no significant difference between the performance scores of male and female students taught reading comprehension using project-based learning method. This finding supports Ala, Oda and Abdul-kadhim (2017) who found no statistically significant differences between male and female students exposed to reading comprehension. The finding, however, contrasts Arellano (2013), Jefe (2015) and Madoda (2016) who found that girls perform significantly better than boys in reading comprehension tasks. Project-based learning method proved effective in this study by eliminating gender differences in students' performance. Project-based learning method gave both male and female students equal opportunities to participate in group project activities, cooperate, carry out investigations on various topics and share ideas. Such activities account for similar levels of performance in reading comprehension of male and female students.

Result on research question three shows that female students performed better than male students taught reading comprehension using the conventional method. However, finding obtained

from hypothesis three indicates that there is no significant difference between the performance of male and female students taught reading comprehension using the conventional method. This finding agrees with Ala, Oda and Abdul-Kadhim (2017) who found no significant differences in the performance of male and female students in reading comprehension. However, the finding disagrees with Jefe (2015) who found that female students perform significantly better than male students in reading comprehension. This finding could be justified on the basis that female students performed better than male students but the conventional method did not provide enough opportunities for them to improve significantly beyond their male counterparts.

Conclusion

Based on the findings of the study, it is concluded that project-based learning method improves students' performance in reading comprehension more than the conventional method. Project-based learning method does not have differential effect on male and female students' performance in reading comprehension. The conventional method does not have differential effect on male and female students' performance in reading comprehension.

Recommendations

Based on the findings of this study, it is recommended that:

1. Teachers of English Language should adopt the use of project-based learning method in helping students to improve their reading comprehension skills.
2. Teacher training institutions should include project-based learning method in the content of the pre-service and in-service training programmes of language education teachers.
3. The Ministry of Education and teaching professional bodies such as Teachers Registration Council of Nigeria (TRCN) and Nigerian Union of Teachers (NUT) should organise conferences, seminars or workshops for in-service teachers on the use of project-based learning method in teaching reading comprehension.

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