

Effect of Simulation Instructional Package on English Language Students' Achievement and Retention in Senior Secondary Schools in Abuja Federal Capital Territory, Nigeria

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The thrust of this study was to assess the effect of simulation instructional package on English Language students' achievement and retention in senior secondary schools in FCT Abuja, Nigeria. Two research questions and its corresponding hypotheses were used. Quasi experimental research design of non-randomized pre-test, post-test, post-posttest control group design was employed for the study. The population of the study comprised of all 12,898 SS 2 students. A sample of 165 students was used for the study. A 50 items multiple choice entitled "English Language Achievement Test (ELAT)" was used as an instrument for data collection. ELAT was validated by expert's which yielded 0.86 validity index and KR-₂₀ formula was used to determine the reliability of internal consistence which yielded 0.85 reliability index. Mean and Standard Deviation were used to answer the research questions while the hypotheses were tested at 0.05 level of significant using ANCOVA. The findings revealed that, there is a significant difference in the achievement of students taught English Language using simulation instructional package and conventional teaching method, and students taught English Language using simulation instructional package had high retentive capacity than their counterpart students taught using conventional teaching method. It was recommended that, the teaching of English Language should be simulation instructional package to enhance students' understanding and long retentive capacity of the subject.

Background to the Study

The significance of English Language acquisition for proficiency in all school subjects cannot be overemphasized because most of the subjects in Nigerian schools instructional materials written in English Language, except Nigerian languages and Arabic language. The importance of this subject may have led the Nigeria Government to make it a compulsory subject at basic education and senior secondary school levels as well as prerequisite for admission into tertiary institutions (Nelson, Nwankwo, and Tochi, 2014). In Nigeria, English Language is one of the core subjects taught at all levels. Students read, write and express themselves in any given task through English language. The subject involves four skills, namely: speaking, listening, reading and writing. Comprehension is the goal of reading. Reading is an essential language skill that deserves much attention by both teachers and students. Reading has a lot of benefits for the individual and for national development (Lorkase cited in Galle, Alaku and Paul, 2020). Reading is highly indispensable in all areas of human endeavours. This is because reading is not only valuable in the classroom but also outside the classroom.

Despite the importance of reading to humanity, students in Nigerian schools are often faced with reading challenges. This is made manifest in their inability to read fluently and comprehend what reads. This ugly trend is often blamed on teachers' inability to teach reading comprehension effectively by using appropriate strategies. Besides, students themselves lack the knowledge that will aid comprehension of reading material and the time allocated to study English Language is limited to only five periods per week which may not be enough to comprehend the rudiments of learning English Language (Galadima, 2019). According to Odudu (2014), reading is needed on a daily basis and virtually, people in all spheres of human endeavours need it. At home, reading is needed to be able to operate machines and electronics and to take drugs correctly. Travelers need to read sign posts for directions and students need reading to be successful in their studies. In spite of the numerous benefits derivable from reading, there is lack of good reading culture among Nigerians generally, and among students specifically. Ochogwu (2012) pointed out that scholars in Nigeria have often lamented the lack of reading culture among Nigerians, particularly students. Many children in school today would be at risk and except they are rescued through the acquisition of reading culture, the age of darkness might recur (Odudu, 2014).

The poor achievement and failure of students in public examinations is generally traced to poor reading and comprehension ability. The West African Examinations Council (WAEC) and the National Examinations Council (NECO) consistently make the comprehension section of their papers compulsory in all their examinations. The acquisition of reading skills is therefore, fundamental in the understanding of all aspects of English Language. WAEC Chief Examiner's reports after different school certificate examinations have consistently highlighted persistent poor achievement of candidates in English Language attributed to factors such as inadequate qualified English language teachers, use of inappropriate methods in helping students to read and lack of interest on the part of the students, among others. WAEC and NECO May/June 2018/2021

academic session English language results in Abuja Federal Capital Territory, Nigeria shows that less than (34% in WAEC, 23% in NECO) of the total students passed English language at distinction, good or credit level while more than (66% in WAEC, 77% in NECO) failed English language which is an indices of poor achievement. Galle, Alaku and Paul (2020) reported that most of the Nigerian secondary school students faced with poor reading culture, lack of comprehension skills among senior secondary school students. Students hardly engage in out-of-the class room involving going through a newspaper, a magazine or any relevant literature texts. It is therefore, not surprising that when a reading class is organized, a good number of students will be dosing, while the rest do not show interest in what is happening in the class.

Achievement can be defined as any effort which is of significance and value to a particular program, but averagely difficult, which is undertaken successfully through knowledge, skills and experience. Anekwe cited in Galle, Alaku and Paul, (2020) described achievement as something which has been accomplished through exertion, skills, practice and perseverance. An achievement test is an ability test designed to measure what the individual has learned to do as a result of planning instruction (Anikweze, 2015). He further argued that an achievement test could be a teacher-made test or standardized tests. A standardized achievement test (SAT) is one in which the procedure, apparatus and scoring have been fixed so that precisely the same testing procedures can be followed at different times in different place. The teacher made tests (TMT) are those achievement tests prepared by classroom teachers. Gender is defined as the behavioural, cultural, or psychological traits typically associated with one sex (Merriam-Webster Online Dictionary, 2013).

Ochogwu (2012), observes those students' attention decreases as lessons progress, especially when instead of being student- centered; the lesson rather becomes teacher-centered. Thus, lack of appropriate learning strategy that involves student-centered activities makes reading comprehension difficult. Grouped discussion learning could be one of the strategies that would help students participate in reading comprehension effectively. Igwebuikwe and Atomatofa (2013), study shows that they do not provide support for the superiority of the discussion method over fieldtrips in enhancing the achievement of students in integrated science lessons, but the effectiveness of the discussion, especially group discussion relevant. Researchers such as Osokoya (2013), Alabi (2014), Oni (2014), Samuel (2017) and Galle (2021), attested that poor instructional strategies employed in the teaching and learning process by teachers contribute to students under achievement. Students find it difficult to understand the fundamental concepts taught by teachers as some students do forget easily due to their retentive capacity.

According to Ngwoke and Eze (2010), defined retention as the process by which a student stores information in his memory for use at a later period. Retention occurs when facts or experiences are stored in long term memory. Galle (2021), conducted a study on effect of computer-assisted instructional approach on economics achievement and retention in

Nasarawa State secondary school, his findings shows that students in experimental group that were taught Economics using CAI-course-lab 2.4 achieved better result than those taught using the conventional method, students in experimental has high retentive capacity mean scores than those taught using the conventional method and both male and female students achieved high scores in experimental than their counterparts in conventional group, as well there is a significant difference in the mean posttest interest scores. The main purpose of teaching is to transfer the horizon of knowledge, skills and good character to the learners as they are the future leaders. For effective teaching and learning to take place, the teacher needs to use different teaching methods and approaches.

Regrettably, poor achievement in English Language in secondary schools has been attributed to poor approach to teaching employed by teachers (Alabi, 2014; Samuel, 2017; and Galle, 2021). Unfortunately, the present Nigerian Basic Science and Technology classroom does not seem to provide hands-on-minds-on challenging, interactive and collaborative environment needed by new generation of students who have been exposed to internet, computer usage, hand-set and other sophisticated gadgets. This problem may best be resolved by the use of simulation instructional package. Simulations are tools that facilitate learning through representation and practice in a repeatable, focused environment. It helps students to identify and understand factors which control the system and or predict the future behaviour of a system. It can bring into the classroom, aspects of the world or universe that are too expensive, dangerous, abstract, difficult or too slow or too fast in occurrence to be comprehended. (Goldsmith, 2011). The use of simulations in the teaching and learning of English Language could help the understanding of abstract and difficult concepts by allowing students to develop their own understanding. Umoke and Nwafor (2014) and Ezeudu and Ezinwanne (2013) observed that the use of simulations instruction gives positive results over time and permits the learner to manipulate variables or parameters and then observe the consequences of their actions.

Several literatures reviewed of empirical studies by scholarly researchers such as Ojo, (2020), The pupils exposed to computer simulation strategy had a higher basic science achievement mean score than their counterparts in the convention strategy. Computer simulation instructional strategy enhanced primary pupils' achievement in basic science. Agu, and Samuel (2018) findings of this study revealed that significant differences were found in the achievement and retention of students taught using Simulation Instructional Package compared to that of the Conventional Demonstration Method. Sulaiman, Mustapha, and Ibrahim (2016), found simulation technique very significant predictor of as the mean performances of student taught with simulation game technique was much higher and better than those taught using lecture method in the cause of lesson presentation in their respective class. Judith and Chika (20214) findings reveal that simulated instructional approach fostered higher achievement in biology than the conventional approach. Instructional simulation approach is therefore superior to conventional approach in facilitating higher achievement in biology among secondary

school students. The aim of the present study was to determine the extent to which classroom exposures to simulation instructional package on English Language students' achievement and retention in senior secondary schools in FCT Abuja, Nigeria.

Research Questions

1. What are the mean achievement scores of students taught English Language using Simulation Instructional Package and those taught using Conventional Teaching Method?
2. What are the mean retention scores of students taught English Language using Simulation Instructional Package and those taught using Conventional Teaching Method?

Research Hypotheses

HO1: There is no significant difference in the mean achievement scores of students taught English Language using Simulation Instructional Package and those taught using the Conventional Teaching Method.

HO2: There is no significant difference in the mean retention scores of students taught English Language using Simulation Instructional Package and those taught using the Conventional Teaching Method.

Material and Methods

Design

The study adopted a quasi-experimental research design which involves the non-randomized pretest, posttest, post posttest, control group design. This was considered suitable because randomization of subjects was not feasible as intact classes constitute the two groups that were used for the study. This is in agreement with the view of Uzoечи, (2015), who postulated that the use of such designs that do not involve randomization is called the quasi-experimental design.

Population and Sampling Techniques

The population of the study consists of 24,545, senior secondary two (SS II) students duly registered in public secondary schools in 2020/2021 academic session in Federal Capital Territory, Abuja, Nigeria. The sample for the study comprised 130 SS II English Language students from two intact classes randomly selected from public senior secondary schools in Federal Capital Territory, Abuja, Nigeria. The experimental group comprised of 63 students' was taught English Language using Simulation Instructional Package (SIP) while the control group comprised of 6 students' was taught English Language using the Conventional Teaching Method (CTM).

Instrument for Data Collection

English Language Achievement Test (ELAT) was developed by the researchers as instrument for data collection. The ELAT contained a 50 items Multiple Choice with four options A-D that tested the students' based on six levels of cognitive domain embedded on operational chart using selected topics in English Language. These topics include

reading comprehension, Oral and grammar. The selection of these topics is based on the fact that they have often been considered difficult to understand by students and also because of lack of adequate facilities for students' practice. The items were allotted 1 mark each, giving total score of 50 marks.

Validity and Reliability of Instrument

ELAT was subjected to two expert's judgment for faced and content validation. An expert from English Language department and the other one from Measurement and Evaluation unit, Nasarawa State University, Keffi validated the instrument (ELAT) by checking for the appropriateness and relevance of the items in agreement with Bloom taxonomy of educational objective as cited in (Galle, 2021). The logical consensus of the experts yielded 0.86 validity index. To determine the reliability of the instrument (EAT), KR₂₀ formula was used which gave r0.82 reliability index. KR₂₀ formula was considered appropriate because, is a more general method of estimating internal consistency for instrument composed of dichotomous items that measure reliability for a test with binary variables; that is A, B, C, D. answers that are right or wrong (Korb, 2015). The reliability result of ELAT was compared with the guidelines for interpreting alpha coefficients suggested (Ugodulunwa and Okolo cited in Galle, 2021) that “ $\alpha \geq 0.9$ excellent, ≥ 0.8 good, ≥ 0.7 acceptable, ≥ 0.6 questionable, ≥ 0.5 poor, ≤ 0.5 unacceptable”. Therefore, the results of the reliability enabled the researchers to use the instrument for both pretest and posttest, since the correlation was considered high and significant.

Procedure for Data Collection

Two research assistants were trained by the researchers to assist in teaching and administered ELAT. The researchers' assistants are regular teachers of English language in the respective school with years of teaching experience and both hold Second Degree in the subject, the researchers monitor their activities. A week training programme was organized with the research assistants. The training programme was to acquaint the research assistants with how to use Simulation Instructional Package (SIP) with the experimental group. The following features were addressed during the training, the objectives of the SIP, and how the test administration, scoring of tests papers were discussed and research assistants were given the opportunity to demonstrate the use of the packages in teaching before the commencement of the treatment.

The training ensured that the teaching was comparable, applying the same teaching skills with little or no variation in their teaching effectiveness. Items for the tests lasted for one hour forty five minutes. During the period of testing, the researchers and research assistants ensured that the students were not cheating. Test items were given to the students as a pretest for the purpose of ascertaining the prior knowledge of the students before the treatment was given to the experimental groups. Students were required to encircle the correct option out of five alternatives (A, B, C, D) provided for each question on the answer sheet. After the time allocated for the test, the scripts were collected marked and scored using a marking scheme. The experimental group students were taught using with SIP while control group students were taught using CTM covering four lessons

taught within seven weeks (4 time lessons in every week). At the end of the seven weeks of teaching the posttest on EAT was administered to both the experimental and control groups. The post post-test took place after two weeks from the treatment. The pretest and posttest results were compared to obtain the achievement mean gain scores and later post post-test scores was compared with the previous scores to determine retention or retentive capacity of the experimental and conventional groups. Means, standard deviation were used for answering research question and analysis of covariance (ANCOVA) using IBM SPSS version 23 were used for testing hypotheses at 0.05 level of significance. The results are presented in below tables.

Results

Answering of Research Questions

RQ1: What are the mean achievement scores of students taught English Language using Simulation Instructional Package and those taught using Conventional Teaching Method?

Table 1: Mean Achievement Scores and Standard Deviation for Control and Experimental Groups

| Treatment Groups | N | Pre-test | | Post-test | | Achievement Gain |
|--------------------------|----|----------|------|-----------|------|------------------|
| | | Mean | SD | Mean | SD | |
| Experimental Group (SIP) | 63 | 15.45 | 1.46 | 27.38 | 1.86 | 11.93 |
| Control Group (CTM) | 67 | 15.35 | 1.34 | 25.39 | 1.88 | 10.04 |

Table 1 shows achievement mean gain of students taught English Language using Simulation Instructional Package (SIP) is 11.93 and those taught using conventional Teaching Method (CTM) is 10.04. Therefore, students taught using SIP gained higher achievement mean scores than their counterpart student in taught using CTM.

RQ2: What are the mean retention scores of students taught English Language using Simulation Instructional Package and those taught using Conventional Teaching Method?

Table 2: Mean Retention Scores and Standard Deviation for Student in Experimental and Control Groups

| Treatment Groups | N | Post-test | | Post Post-test | |
|--------------------------|----|-----------|------|----------------|------|
| | | Mean | SD | Mean | SD |
| Experimental Group (SIP) | 63 | 27.38 | 1.86 | 29.15 | 1.82 |
| Control Group (CTM) | 67 | 25.39 | 1.88 | 23.15 | 1.89 |

Table 2 shows mean retention scores of students taught English Language using Simulation Instructional Package is 29.15 and those taught using Conventional Teaching Method is 23.15. That is the post post-test retention scores of students taught English Language using SIP greater than those taught using CTM. It applies that students in SIP has more retentive capacity than those taught using CTM.

Testing of Hypotheses

Ho1: There is no significant difference in the mean achievement scores of students taught English Language using Simulation Instructional Package and those taught using the Conventional Teaching Method.

Table 3: ANCOVA Tests for Significant Difference in Mean Achievement Scores of Students taught English Language using SIP and those taught using CTM

| Source of Variation | Type III Sum of Squares | Df | Mean Square | F _{cal} | P-value | Sig |
|---------------------|-------------------------|-----|-------------|------------------|---------|--------|
| Corrected model | 543.1473 ^a | 2 | 532.720 | 50.415 | .010 | P<0.05 |
| Intercept | 32105.46 | 1 | 57205.489 | 8908.122 | .002 | P<0.05 |
| Pre-ELAT scores | 6316.475 | 1 | 531.729 | 50.415 | .002 | P<0.05 |
| Groups | 43335436 | 1 | 4434321 | 123.632 | .001 | P<0.05 |
| Error | 651.22543 | 126 | 14.764 | | | |
| Total | 26410.095 | 129 | | | | |
| Corrected Total | 2326.7421 | 130 | | | | |

Table 3 reveals that the calculated F-ratio of 123.632 was found to be greater than the P_{value} .001. at the 0.05 level of significant. Therefore, the null hypothesis one was rejected; hence there is a significant difference in the achievement means scores of students taught English Language using simulation instructional package and those taught using conventional teaching method.

Ho2: HO2: There is no significant difference in the mean retention scores of students taught English Language using Simulation Instructional Package and those taught using the Conventional Teaching Method

Table 4: ANCOVA Tests for Significant Difference in Mean Retention Scores of Students taught English Language using SIP and those taught using CTM

| Source of Variation | Type III Sum of Squares | Df | Mean Square | F-Ratio | P-value | Sig |
|---------------------|-------------------------|-----|-------------|----------|---------|--------|
| Corrected model | 543.1473 ^a | 2 | 532.720 | 50.415 | .002 | P<0.05 |
| Intercept | 32105.46 | 1 | 57205.489 | 8908.122 | .002 | P<0.05 |
| Pre-EMEAT scores | 6316.475 | 1 | 531.729 | 50.415 | .002 | P<0.05 |
| Groups | 43335436 | 1 | 4434321 | 431.152 | .002 | P<0.05 |
| Error | 651.22543 | 126 | 14.764 | | | |
| Total | 26410.095 | 129 | | | | |
| Corrected Total | 2326.7421 | 130 | | | | |

Table 4 reveals that the calculated F-ratio of 431.152 was found to be greater than the $P_{.value}$.002 at the 0.05 level of significant. Therefore, the null hypothesis two was rejected; this implies that student taught English Language using SIP has retentive capacity of the concept than their counterpart taught using CTM, hence there is significant difference in the mean retention scores of students taught English Language using SIP and those taught using the CTM.

Discussion

Table 1 shows achievement mean gain of students taught English Language using Simulation Instructional Package (SIP) is 21.93 and those taught using conventional Teaching Method (CTM) is 10.04. Therefore, students taught using SIP gained higher achievement mean scores than their counterpart student in taught using CTM. Drawing inference from null hypothesis one in Table 3 revealed that there is a significant difference in the achievement means scores of students taught English Language using simulation instructional package and those taught using conventional teaching method. This finding is in agreement with that of Ojo (2020), that pupils exposed to computer simulation strategy had a higher basic science achievement mean score than their counterparts in the convention strategy, Judith and Chika (20214) findings reveals that simulated instructional approach fostered higher achievement in biology than the conventional approach. Instructional simulation approach is therefore superior to conventional approach in facilitating higher achievement in biology among secondary school students.

Lastly, Table 2 shows mean retention scores of students taught English Language using Simulation Instructional Package is 40.15 and those taught using Conventional Teaching Method is 14.15. That is the post post-test retention scores of students taught English Language using SIP greater than those taught using CTM. It applies that students in SIP has more retentive capacity than those taught using CTM. Drawing inference from null hypothesis two in Table 4 reveals there is significant difference in the mean retention scores of students taught English Language using SIP and those taught using the CTM.

This implies that student taught English Language using SIP has retentive capacity of the concept than their counterpart taught using CTM. This finding is corroborated with that of Agu, and Samuel (2018), findings of this study revealed that significant differences were found in the achievement and retention of students taught using Simulation Instructional Package compared to that of the Conventional Demonstration Method. Sulaiman, Mustapha, and Ibrahim (2016) found simulation technique very significant predictor of as the mean performances of student taught with simulation game technique was much higher and better than those taught using lecture method in the cause of lesson presentation in their respective class.

Conclusion

The findings of this study revealed that, significant differences were found in the achievement mean scores of students taught English Language using simulation instructional package than those students taught using in using conventional teaching method, and those student taught English Language using SIP has retentive capacity of the concept than their counterpart students taught using CTM.

Recommendations

Based on the findings of this study, the following recommendations are made:

1. It was recommended that, the teaching of English Language should use simulation instructional package to enhance students' understanding and long retentive capacity of the subject.
2. It is recommended that the Nigerian Educational Research and Development Council (NERDC) should consider incorporating simulation instructional package into the teaching of English Language

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