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Research Article

Impact of Simulation on Students' Academic Achievement in English Language in Secondary Schools in Isi-Uzo Local Government Area of Enugu State

BY

DR. MERCILLINA MMACHINYERE EBUOH
E-mail:mercillina.ebuoh@esut.edu.ng Phone +23408063962158
Department of Educational Foundations Faculty of Education, Enugu State University of Science and Technology, Nigeria.

ABSTRACT

Despite the position of English language in the National Policy on Education as a core subject, students' performances in the subject have not been encouraging. The study was designed to investigate the impact of simulation on students' academic achievement in English Language in secondary schools in Isi-uzo L.G.A of Enugu State. The researcher adopted a non-equivalent quasi-experimental design. The population of the study was all the 5,195 SS 2 students in Isi-uzo LGA of Enugu State. A sample of two hundred and fifty two (252) SS 2 students was drawn from the three secondary schools used; one intact class was then sampled using simple random sampling technique. One intact class was assigned to the Experimental Group I taught using simulations and the other intact class was assigned to the group II taught without simulation. Two research questions and one hypothesis guided the study. Relevant data for the study were collected using English Language Achievement Test (ELAT). The instrument was face validated. The reliability of the instrument was determined using Kuder Richardson 20 which was 0.87. Research question was answered using mean and standard deviations while hypothesis was tested using Analysis of Covariance (ANCOVA). It was found that the use of simulation in teaching English language was better than teaching without simulations. Teaching without simulation had no significant influence on students' achievement in English language in secondary schools. Based on the findings the researcher recommended among others that simulation be adopted for use in teaching English Language in secondary schools

Keywords: Achievement, English language, Teachers, Performance, Simulation

1.0 INTRODUCTION

Researchers and English language teachers have observed a wave of indifference which borders on almost total dislike for English language among secondary school students. Possible explanation could be that the subject is generally assumed erroneously to be too abstract and far too removed from practical life. This observation is not surprising at all considering the poor manner in which English is presented to students in the classroom. Federal Ministry of Education listed English language as one of the subjects that enable the students think creatively and consecutively in English terms and help them to acquire manipulative oral English speaking amongst others. These objectives of the federal government can be realized using instructional materials eg simulations in teaching English language in secondary schools.

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Many scholars have given different definition of simulation. [1]Okwor and Ike in Ebuoh (2014) defined simulation as the presentation of an artificial problem, event, situation, or object that duplicates reality but removes the possibility of injury or risk to the individuals involved in the activity. According to [2] Ellighton, Gordon and Fowlie (2008) simulation is an operating representation of central features of reality. This statement presupposes that simulation has to do with simplified model or reality, used to understand real object or system. [3] Dubey and Barm (1997) sees simulation representing some real - world system, as a symbol with a referent, just like the real - world system it supposed to be representing while [1]Duby in Ebuoh (2014) defines simulation as model of something, an attempt to mimic a real or imaginary environment or system. In summary, simulation is a representation of manageable real events in which the learner as an active participant, engaged in learning behaviour or in applying previously acquired skills or knowledge. It can be seen as a working representation of central fact of reality. [4] Ginsbury (2000) pointed out that simulation through selected representation of reality contains only those elements of reality that are relevant to the purpose of the simulation. In simulation, an aspect of real situation is recreated, competition granted with participants acting some role bounds and involves making working replicas or representations of machines for demonstration for analysis of problems. This system or environment is hidden behind an interface, such as computer, graphics or game board that allows the user to access the system or situation which is being modeled. In most cases it is necessary to build a simulation in place of the real system or environment because the actual system being modeled should or cannot be experienced directly. Reasons such as cost, danger, accessibility or time" are often used as the justification for interacting with a simulation rather than the real world object or system [5] Uchegbu (1986). At times simulations are not used because of lack of access to a system, but used simply because they are compelling objects in themselves. The Modeled is not used to understand the real thing being Model, but simply used because it is of interest in itself [6]Etoama, (1988). Simulation visually illustrates real life or hypothetical situations. It permits the learner to see concepts and principles in action, which would not be possible through improvisation, chalkboard or pictures; it has been argued that simulation “can enhance user motivation by bridging the gaps between work, education and play" [5]Uchegbu, (1986). The implication is that simulation is a powerful motivational tools that can make learning fun and learner better achieved in English language.

According to [7] (Thomas, 2001), simulations could be classified into four categories:

(a) **Experiencing simulations**: which allow learners to explore a certain topic prior to formal presentation of related content.

(b) **Informing simulations:** which are used in lieu of textbooks to transmit certain bodies of information to learners.

(c) **Reinforcing simulations**: which aim to reinforce learners' understanding of specific instructional objectives by providing them with opportunities to apply previously learned concepts, and

(d) **Integrating simulations:** which allows learners to integrate their knowledge and understanding of a number of seemingly independent facts and concepts that were learned more or less separately

[2] Ellington 1998 in [1] propounded two types of simulations.

1. **Physical simulation** "required the learner to construct a mental model of how a system functions" by examining the relationships between its components.
2. **Procedural Simulation** is a training tool that teaches the user to change the values of the parameters to see how they affect the system. This classification scheme appears to be focused on the outcome or educational intent of the simulation, the learning of the model in order to access the system upon which it is based.

Simulations can also be classified along the line of functions performed by the participants, or at least by a neutral person -- the organizer. In this sense, simulation can be seen as a role play, that is any special or human activity in which participants "take on" and "act out" "specified role" often within a pre- defined social framed work or situational blue prints. This role may be full blown or non- role depending on the congruency between the role player and the represented person from all these expositions. It is evident that simulations are service oriented, and helps a lot in rejuvenating some decayed methods of teaching. The researcher is of the view that this ability of simulation adjusts along the line of the societal needs help to improve teaching and learning of English language in schools.

Achievement in English language has worried scholars in the field of English language- A study carried out on achievement in English language by the International Centre for Educational Evaluation, University of Ibadan ICEE (1985) with particular

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reference to the Nigerian population showed that achievement in English Language consistently becomes poor at secondary school level. [8]WAEC (2017) report on students' performance reveals a decline in English language achievement.

The achievement of students in English languages is closely related to the use of instructional materials. For instance, [9]Mcluhan (2009) pointed out that no real education may take place without appropriate instructional materials. Consequently, the present work investigated the level of students' achievement when simulations are used in the teaching of English-language students in Secondary Schools in Isi-uzo Local Government Area.

According to[10] Blair (2009) to achieve is to accomplish, gain, reach by effort or do something successfully with an effort and skill. [11]Love (2013) asserted that academic achievement concerns mental health. He explained that mental health has its basis, physical health and intellectual skills, which lead to satisfactory means of adjustment, social sensitivity and adequate self-concept.

1.1 Statement of the problem

The outcomes of the Nigeria secondary school student examination in English language have been consistently poor. For instance, in May/June 2015, Senior Secondary School certificate Examination in Enugu Education zone, student continued to record low achievement and retention which may have resulted to poor academic achievement in the subject [8] (WAEC, 2017). On the instructional side, the pace of adoption and use of various instructional materials and technologies in schools and institutions is considerably slow, despite an increasing proliferation of teaching and learning technologies like the audio, visual and now interactive technologies like the closed circuit television cameras [12] (Muhammad, 2019).It appears that in Nigeria, teachers are more conversant with teaching without instructional materials, which is regarded as (conventional) traditional method of teaching, than they are with the use of instructional materials. The unfortunate situation of not using these instructional materials and teaching aids has contributed to the students dwindling performance in English language examinations as observed by linguistics and English language teachers. Thus, the research sought to investigate if the use of the conventional, method of teaching is better than the use of instructional materials such as simulations in achieving higher performance in English language in senior secondary schools.

1.2 Purpose of the study

The purpose of the study is to find out the impact of simulation on students' academic achievement in English Language in secondary schools in Isi-uzo LGA of Enugu State.

1.3 Scope of the study

The scope of the study is to find out the impact of simulation on students' academic achievement in English Language in secondary schools in Isi-uzo LGA of Enugu State and also to find out the level of difference in the mean achievement scores of students taught using simulations in English language reading-comprehension.

II METHODOLOGY

2.1 Research questions

1. What is the mean achievement scores of students taught English Language using simulations?
2. What is the difference in the mean achievement scores of students taught English Language using simulation and those taught without simulation (conventional methods).

2.2 Hypothesis

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There is no significant difference in the mean achievement scores of students taught English language using simulation and those taught without simulation.

2.3 Study Design

The design of his study is quasi-experimental. The design is specifically a pretest post-test, non equivalent group design. The choice of this design agreed with [10] Blair (2009) and Abimbade in[13] Okafor (2000) who observed that this design was often used in classroom experiments when experimental and non-control groups are naturally assembled groups, such as intact classes, which may be similar in the level of education. This study was carried out in Isi-uzo LGA of Enugu State, which is mainly a rural area with few semi-urban areas. The rural areas are mainly occupied by Isi-uzo indigenous and few non-indigenous persons - Most of them are farmers, a good number are petty traders while few are civil servants. The choice of this area is because of logistical convenience and the researcher saw the zone as densely populated zone in terms of SS2 students.

The populations considered were all the twelve (12) secondary schools in Enugu Education zone. The population was 5,195. (PPSMB, 2018).

Stratified simple random sampling was used to draw three schools from the twelve secondary schools in Isi-uzo LGA Local Government Area. In each of the sampled schools, purposive sample, simple random sampling was used to pick three intact classes of SS2 in each school.
Three intact classes were randomly assigned to the experimental group I and II. A total of one hundred and twenty seven (127) students were used for experimental group while one hundred and twenty five (125) were used as control giving a grand total of two hundred and fifty-two (252) SS 2 students that was used as research subjects in the study.

English language Achievement Test (ELAT) developed by the researcher was used for data collection which consisted of forty seven objective test items. The choice of objective test items was to allow the researcher to cover more topic areas. Thirty seven objectives test items were at the lower cognitive level (that is knowledge and comprehension) while 10 items were in higher thinking process (that is application). The instrument was used for pretest and posttest. The items for the ELAT were written to reflect the specification in test blue print prepared. The scoring guide for the ELAT was prepared in order to guide the teachers that scored the ELAT.

The instrument went through both face and content validity. The items of ELAT and experimental packages were subjected to face validation by one expert in English language education, one expert in educational technology and one expert in Measurement and Evaluation. The instrument and experimental packages were validated in terms of clarity, appropriateness of the language used and also if any item is ambiguous. Their corrections and comments were useful in modifying the items of the tests and experimental packages. The surviving items, therefore, possessed adequate face validity of the instrument for data collection. The English Achievement Test after scoring guide was also “face” validated by the experts that validated the same English language Achievement Test. Forty-six questions survived out of sixty questions after validation.

The reliability of ELAT was determined using test re-test method. The choice is because it is most suitable and appropriate in determining the correlation between sets of scores from two administration of the test. To determine the reliability of ELAT for the study, the ELAT was trial tested in community secondary school Amandim Olo in Ezeagu LGA of Enugu State. Then the sets of scores from the test administration of ELAT were correlated using Pearson Product moment correlation coefficient (r) = 0.86. The measure of internal consistency was determined using Kuder Richardson 20. (K-20). The value of Kuder Richardson value was 0.868. The choice of Kuder Richardson’s 20 was the most appropriate because the items were dichotomously scored.

Three English Language teacher (research Assistants) from each of the sampled schools received briefing for a period of one week from the researchers on the use of simulations and teaching without simulations in teaching English Language respectively. Prior to the treatment, the English language teachers / research Assistants in the sampled schools who received

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briefing on how to use the research instrument administered the ELAT respectively to their SS2 students. At the end of the testing, the question papers and the answer script were collected from each student who took the pretest. There were some extraneous or confounding variable that the researcher felt could constitute potential threats to the validity, reliability and generalization of the results of the study. Such variable included inter-group variable, teacher variables and Hawthorne effect. ELAT was administered as pretest on the first week of treatment by research assistants. Scores of the students on the pretest were recorded and kept for the use after the experiment. The post test data were also generated after re-administration of ELAT to the students on the last week of treatment. For each of the groups, data for pretests and post tests were recorded separately. The test item on ELAT was scored two marks each to give a maximum mark of one hundred percent.

Mean and standard deviation were used in answering the research questions. Mean was used because it is the most appropriate statistical tool to use for such situation because such takes all measurement (observations) into consideration. Analysis on covariance was used to test the hypothesis. Analysis of covariance (ANCOVA) was used because intact classes were used and as such corrected the errors of initial differences in the ability levels among the students used in the study. Rejected the null hypothesis (Ho) if the F-calculated is greater than F-table at 0.05, then fall to reject the null hypothesis at 0.05 if F-calculated is less than F-table.

III Results

3.1Research questions

Research question 1

What is the mean achievement scores of students taught English Language using simulations?

Table 1: Mean Achievement Scores of Students Taught English Language Using Simulations

	Mean (X)		Standard Deviation		N
Groups	Pretest	Posttest	Pretest	Posttest	
Experimental Group 1: (taught using simulation)	22.08	43.07	2.06	5.36	127
Total					127

Table 1 above showed that the experimental group 1 taught using simulations obtained mean achievement scores of 22.80 and 43.07 and standard deviation of 2.06 and 5.36 in pretest and posttest respectively.

Research question 2

What is the difference in the mean achievement scores of students taught English Language using simulation and those taught without simulations (conventional methods).

Table 2: Mean Achievement Scores of Students Taught English Language Using Simulation and Those Taught without Simulation.

	Mean (X)	**Standard Deviation**	**N**

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Groups	**Pretest**	**Posttest**	**Pretest**	**Posttest**	
Experimental Group 1: (taught using simulations)	22.18	43.07	2.06	2.36	127
Experimental Group2:(taught without simulation)	22.41	23.17	2.81	10.26	125
Total					252

Table 2 above showed that the experimental group 1 taught English language using simulation obtained mean achievement scores of 22.18 and 43.07 in pretest and posttest respectively. The group 1 equally had standard deviation of 2.06 and 5.36 in pretest and posttest respectively. Alternatively, the Group 2 taught English Language without using simulation got mean achievement scores of 22.41 and 23.17 in pretest and posttest respectively. The group also had standard deviation of 2.81 and 10.26 in pretest and posttest respectively. Table 2 therefore showed that the experimental Group 1 taught English Language using simulation achieved higher than those taught English Language without using simulation in posttest.

3.2 Hypothesis

There is no significant difference in the mean achievement scores of students taught English language using simulation and those taught without simulation.

Table 3: Analysis of Covariance of Mean Achievement Scores of Students Taught English Language Using Simulation and those Taught without Simulation.

Source of Variation	Sum of Square	Df	Mean Square	F-Cal	Sig. off
Covariates	1073.496	1	1073.496	11.704	0.001
Main effect	5031.576	2	5652.733	55.904	0.000
Instructional material (conventional and simulation)	64560.259	1	64560,259	6593.233	0.000
Error	22236.339	287	91.781		
Residual	78071.063	4	17729.016	159.854	0.000
Total	164609.73	295	89035.2S5	0	

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It was discovered from the result of Analysis of Covariance (ANCOVA) in table 3 above that the F calculated (6593.233) is greater than the F critical (0.000). This implies that, the null hypothesis of no significant difference in the mean achievement scores of students taught English language with simulation and conventional was rejected at 0.05 level of significance. This means that there was a significant difference in the mean achievement scores of student taught English language with simulation and those taught with conventional in favour of simulation.

3.3 Discussions of the Findings

The result showed that the experimental group 1 taught English language using simulation did better than those taught without.
The result of the hypothesis revealed that there was a significant difference in the mean achievement scores of students taught with simulation and those taught without simulation (conventional methods) in favour of the use of simulation. The result of the study is in agreement with the findings of [14] Pink and Thomas (2009) who observed that teachers' knowledge of common organizational ability and their ability to use instructional and technological materials influence students' achievement in English language.

IV CONCLUSIONS

There was a significant difference in the mean achievement scores of students taught with simulation and those taught without simulation (conventional methods) in favor of the use of simulation.

V. RECOMMENDATIONS

The following recommendations were made based on the findings of the study:

1. English language teachers should use simulation in teaching English lessons especially when the students size are large and when there is shortage of staff.
2. Principals through the help of government should organize periodic workshops and seminars to equip teachers with the needed skill and resources that will encourage the use of simulations in teaching.
3. Principals should enforce the use of instructional materials especially simulations in teaching English Language.

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