

Effect of Simulation Techniques and Lecture Method on Students' Academic Performance in Mafoni Day Secondary School Maiduguri, Borno State, Nigeria

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Abstract

The study examined the effect of simulation technique and lecture method on students' academic performance in Mafoni Day Secondary School, Maiduguri. The study used both simulation technique and lecture methods of teaching at the basic level of education in the teaching/learning environment. The study aimed at determining the best predictor among the two variables. Using quasi-experiment as a design for this study, a sample of ninety students was purposively sampled across the 3 levels of junior secondary classes in the school. Instrument called basic science achievement test (BASAT) was used as a guide for testing the academic performance of basic science students across the levels both in experimental and control groups. Using t-test of independent variable, the study 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. It was recommended among others that teacher should make effective use of simulation techniques method in lesson delivery as it shows to be more promising in enhancing students' academic performance at the basic level of education in Mafoni Day Secondary School, Maiduguri, Nigeria.

Keywords: Simulation Games Techniques, Lecture Method, Basic Education, Role play Instructional Strategy,

INTRODUCTION

Simulations are instructional scenarios where the learner is placed in a "world" defined by the teacher. They represent a reality within which students interact. The teacher controls the parameters of this "world" and uses it to achieve the desired instructional results. Students experience the reality of the scenario and gather meaning from it. A simulation is a form of experiential learning. It is a strategy that fits well with the principles of Student-Centered and constructivist learning and teaching.

Simulations take a number of forms. They may contain elements of:

- a game
- a role-play, or
- an activity that acts as a metaphor.

Simulations are characterized by their non-linear nature and by then controlled ambiguity within which students must make decisions. The inventiveness and commitment of the participants usually determines the success of a simulation. When students use a model of behavior to gain a better understanding of that behavior, they are doing a simulation. For example:

- When students are assigned roles as buyers and sellers of some good and asked to strike deals to exchange the good, they are learning about market behavior by simulating a market.
- When students take on the roles of party delegates to a political convention and run the model convention, they are learning about the election process by simulating a political convention.
- When students create an electric circuit with an online program, they are learning about physics theory by simulating an actual physical set-up.

Students often use simulations to make predictions about the social, economic, or natural world.

Effective teaching methods stimulate learners' interest which therefore forms a base for achieving desired curriculum objectives in a school setting. Essentially, teacher-centered teaching methodologies are considered obsolete; a big burden with little impact on the learning development of the child; the conventional educational system emphasizes strongly on those teaching methods that will full and actively involved the child learner rather than considering him as passive, ignorant and mere recipient of knowledge. It is believe that involving learner in the teaching and learning via inquiry and simulation games teaching methods will make teaching and learning more interesting, make the classroom environment lively, arouse the interest of the learners and sustained their interest and attention throughout the teaching and learning period. Hence, exposure of the learner at early stage of education is regarded as a foundation, upon which the success or failure of future

educational system lies (Bello, 2015). Therefore in this regard the use of effective teaching techniques at this level of education is vital to the survival of the system. Practitioners in this context advocated a child-centered education and their views had a great deal of influence on modern educationists. Bello, Bukar and Ibi (2016) maintained that learners possess within himself certain potentialities for development, and that it's the task of the teacher to make these potentials develop itself instead of imposing some external measures. There are hues and cries that teachers at various levels of education were accustomed to traditional methods of teaching especially the lecture and didactic methods. Studies from Maran, (2003), Bame (2004) and Bello, Bukar & Ibi (2016) confirmed that the negative attitude of learners at the basic education level towards certain subject is a result of poor teaching technique. It has also been argued that teachers do not support the effective handling of their subject to boost academic performance of their pupils. Simulation games teaching technique is one of those techniques that is widely believed among other learner-centered approaches to promote effective transactions and communication between teacher and the learners.

Simulation games are representation of an actual physical or social situation reduced to manageable proportions to serve a specific purpose, or any context or play among adversaries, operating under constraints or rules for an objective like winning, victory, or play-off, which have two characteristics: overt competition and rules (Yerima, 2007). Adoke (2015) maintained that simulation games combine unique characteristics, which makes it suited to situations where the stress is on interactive learning. It produces fun, effective learning and approximately the real world. They describe simulation game as a contrived activity which corresponds to some aspect of reality. Simulation games provides opportunities for students to analyze problems, make decision, manage real life situations, control projects and experience the consequences of their actions. They are design to help student to learn to achieve specific objectives actively rather than passively. Simulation games take learning out of area of abstraction and make it participatory skills. It involves learning by doing and this is of particular benefit where human relations, interactions and emotions are involved. Skills are required through practice and enables participants to learn facts, processes and alternative strategies. There are various strategies available for achieving effectiveness and the teacher has full responsibility for selecting the most appropriate one in order to deliver successfully.

When designing well both simulations and gaming environments can facilities students learning of both specific domain of knowledge and concepts. Cognitive skills like pattern recognition, decision making and problem-solving will be enhanced and rapidly articulated. From his review, Randel, (1992), concluded that educational gaming could be used effectively to provoke Mathematics, Physics and language arts when specific instructional objectives were targeted. Funk (2002) found information processing problem-solving, social development and academic abilities. Other educational strengths of using simulation games include developing a variety of cognitive objectives transferable process skills student-centered learning initiative, creative thinking, affective objectives sense of completion and knowledge integration (Ellington, 1998).

In a related development, the National Teachers' Institute (2000) in Adoke (2015) in discussing the importance of simulation methods in social studies classified the educational strength of the methods into 4 categories namely: social skills, knowledge goals, valuing and problem solving. In discussing the strength of the simulation methods in developing social skills among the learners, the National Teachers' Institute (2000) further opined that since each and every learner is an active participant, the shy ones does not feel "observed" and trends to communicate effectively with peers. The aggressive learner is also forced to modify his interaction habits since new peer relationship develop during the game. Most simulations depend on peer interaction and pupils are forced to share their ideas with others. Social skills are developed as pupils are forced to obey the rules of the game and work with classmates for the benefit of the group team goals. The problem of this study hinges on a determination of the effect of simulation games technique and lecture method that determine the instructional effectiveness of students' academic performance in Mafoni Day Secondary School, Maiduguri, Borno State, Nigeria.

Objective of the Study

The objective of the study is to determine the effect of simulation techniques and lecture method on students' academic performance in Mafoni Day Secondary School Maiduguri, Nigeria.

Research Question

1. What is the effect of simulation games technique on students' academic performance in Mafoni Day Secondary School?
2. What is the effect lecture method on students' academic performance in Mafoni Day

secondary School Maiduguri?

Hypothesis

Academic performance of students taught with simulation games technique does not significantly differs with the performance of students taught using lecture method in Mafoni Day Secondary School, Maiduguri.

Methods

The study covered junior secondary school 1-3 in Mafoni Day Secondary School Maiduguri as teaching subject chosen for the experiment was basic science. It also used the non-equivalent comparison group which is widely believed to be the most commonly used quasi-experimental design (Muhammed (2015). In its simplest form, it requires a pretest and posttest for a treated and comparison group. It is a design in which the effects of a treated or intervention are estimated by comparing outcomes of a treatment group and comparison group but without the benefit of random assignment (salihu 2015). The researcher thus chose this design because of its suitability to the demands of the study.

The study utilizes purposive sampling to choose the participating class for the quasi-experiment. However, olayiwola (2007) states that 30 participants of each group (experimental and control) are considered adequate for this kind of study. Each level is represented by 30 participants, having 15 for experimental and 15 for control group running through JSS1-3 giving a total of 90 students sampled for the study respectively.

Instrumentation

Teacher made test known as basic science achievement test (BASAT) was used as an instrument used for the purpose of testing the academic performance of basic science students across the levels both in experimental and control groups. The study used table of specification to determine the content validity of the test items. Yerima (2007) view table of specification as two way-dimensional tables which defines as clearly as possible the scope and emphasis of the test items and relate the objective to the content, so as to certify the most important criteria of the test and that of content validity.

The data for this study were the scores of the teacher made test (BASAT) obtained from the pre-test post-test administered to the control and experimental groups. The study used mean and standard deviation to answer the questions raised by the study. T-test was used in testing the research hypothesis.

Results

Presented below are quantitative and qualitative answers provided for the question raised by the study. The frequency table, mean, standard deviation and standard error were used as statistical tools to answer the questions raised.

Research question:

Table1:1 Descriptive statistics on the academic performance of pupils taught with simulation games technique and those taught using lecture technique

Techniques	N	Mean	Standard deviation
Simulation games	90	66.2333	7.07195

Table 1.1 above revealed the academic performance of pupils taught using simulation games technique and those who were taught with lecture technique. The mean academic performance of the simulation games group was 66.23 and that of the lecture group was 46.60. This implies that pupils who were taught with simulation games technique had higher mean academic performance than their counterparts taught with the lecture technique.

Hypothesis:

The hypothesis formulated in the study was statistically tested using independent sample t-test. The outcomes of the statistical analysis are presented below to guide the study on either to retain or reject the null hypothesis set by the study.

Ho: Academic performance of students taught with simulation games technique does not significantly differs with the performance of students taught using lecture method in Mafoni Day Secondary School, Maiduguri.

Table 1.2 t-test mean performance of students thought using simulation games and lecture methods

Variable	groups	N	Mean	std. dev	Df	Adjusted R	R.sqr	f. chang.	df	sig.	
Academic Performance	simulation games	90	66.23	7.07	118	12.86	1.97	.66	63.00	321	rejected
	Lecture	90	46.60	9.48							

SPSS t-test og mean difference

Table 1.2 Correlation of mean academic performance of students taught with simulation games technique and those taught with lecture method. Results from the t-test indicated a significant effect in the mean academic performance of pupils taught with simulation games technique and those who were taught with lecture technique. Reason being the fact that the calculated p-value of 0.001 is less than the 0.05 level of significance while the calculated value of 12.86 is higher than the 1.96 critical value at Df 118. However, their calculated mean academic performances were 66.23 and 46.6 for pupils taught with simulation games technique and those who were taught with lecture technique respectively. Therefore the null hypothesis is hereby rejected.

Findings

The study found that simulation games technique has significant positive effect on students' academic performance at Mafoni Day Secondary school, Maiduguri, Borno, state, Nigeria.

Discussion

Results from the study shows that significant effect of performances of student taught with simulation games technique which is better than those taught with lecture technique. Simulation games technique has significant positive impact on students' academic performance at JSS Secondary school level in Mafoni, Maiduguri. The findings of this study corroborated that of Dauda (2015) ; Adoke (2015), their studies examined the effect of simulation games technique on students academic performance and found that simulation games technique was more effective in comparison to other teaching techniques of teaching especially the teacher-centre approaches.

The lecture technique is considered ineffective due to the facts that, it creates little impact on learners' academic performance, because the lesson is dominated by a teacher, talking to the learners where the learners remain passively listeners and recipient of knowledge. There were little or no use of materials by the learners, the learners level of abilities where not taking into cognizance by the teacher. It is believe that use of learner-centered approach make teaching and learning more interesting, make the classroom environment lively, arouse learners interest and sustained their interest and attention throughout the teaching and learning process as a result of involving all learners in the lesson through pairs and group work, learners of all abilities get opportunity to think, the teacher focuses on understanding not just memorization and recall of fact (Bukar, Bello & Ibi 2016).

The learners-centered approach to teaching and learning (simulation games) is supported by experimental learning theory. As Brookfield (1983) in Muhammed (2015) opined that writers in the field of experimental learning have tended to use the term in two contrasting senses. On one hand, the term is used to describe the sort of learning undertaken by students who are given a chance to acquire and apply knowledge, skills and feelings in an immediate and relevant setting. Experimental learning thus involves a direct encounter with the phenomena being studied rather than merely thinking about the encounter, or only considering the possibility of doing something about it, learners-centered approach to teaching and learning offers just that the second type of experimental learning is education that occur as a direct participation in the events of life (Houle, 1980).

Simulations can be used as part of the process of learning rather than as a summative measure of it. Use follow-up activities to establish a measure of comprehension and as a de-briefing mechanism when students return to reality (e.g. use reflection on the process as the assessable component of the activity, rather than participation in the simulation itself). Simulations promote the use of critical and evaluative thinking. Because they are ambiguous or open-ended, they encourage students to contemplate the implications of a scenario. The situation feels real and thus leads to more engaging interaction by learners. It further promotes concept attainment through experiential practice. They help students understand the nuances of a concept. Students often find them more deeply engaging than other activities, as they experience the activity first-hand, rather than hearing about it or seeing it.

Simulations help students appreciate more deeply the management of the environment, politics, community and culture. For example, by participating in a resource distribution activity, students might gain an understanding of inequity in society. Simulations can reinforce other skills indirectly, such as debating, a method associated with some large-scale simulations, and research skills.

Conclusion and recommendation

Based on the findings of this study, it was concluded that the simulation games technique is more effective with students at Basic education level which is said to be much better than the lecture technique. In the light of the above, the study recommends among others the use of simulation games technique by basic science teachers in teaching and learning at both Primary and Junior Secondary School in Maiduguri, Borno State, Nigeria as it enhances effective transaction and communication between teacher and the pupils which in turns improves academic performances.

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