

In Search of a More Effective Strategy: Using Simulation Games Instructional Strategy for the Teaching and Learning of Social Studies in Secondary School

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Abstract:

This study investigated the effect of simulation game instructional strategy on academic performance of students in secondary school Social Studies. The quasi-experimental design was employed. One hundred and sixteen (116) Upper basic 2 students from six schools constituted the study sample. 50-items multiple-choice Social Studies Achievement test (SSAT) was used to collect data. The SSAT was tested for reliability, and a value of 0.79 was obtained. Means, standard deviation, and analysis of covariance were used to analyze and interpret data obtained. The result of the study showed that simulation games instructional strategy enhanced students' performance in the social studies classroom; gender did not influence students' academic performance. Based on the findings, it was recommended among others that simulation games strategy should be used in teaching Social Studies. Social Studies educators and curriculum planners should incorporate innovative, problem and activity-based instructional strategy like simulation games in all institutions where teachers are trained.

Key words: Simulation games; Instructional Strategy; Social Studies; Academic Performance; secondary School.

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Introduction

In today's world, the conventional approaches towards finding solutions to problems is becoming increasingly inefficient in the face of complex and dynamic daily experiences. This underscores the need to evolve and derive germane, innovative, and constructive solutions to life's challenges (Hassan & Ogunyemi, 2008). Social Studies, one of the fundamental and compulsory subjects offered at the secondary school level, is seen as an instrument for national development and building a strong Nigeria irrespective of ethnic and cultural differences. Adeyemi & Ajibade (2011) opined that the issues of desirable values, associations, and interactions can be addressed through Social Studies. Even though the inclusion of Social Studies in our school programme could be of great benefit, few gains have been made because of poor handling of the subject (Adekunle, 2011).

Research such as that carried out by Akpochofo (2001), Arisi (2002), and Oganwu (2004) revealed that despite more than three decades of developing theories describing exactly how people learn, the majority of teachers still dispense facts using lectures without regard for students' learning abilities. In other words, the lecture strategy, which has no enduring outcome on the learners, still dominates our classrooms (Oganwu, 2004). Social Studies as a discipline needs constructivist teaching strategies that identify problems, encourage learning by investigation, and produce possible solutions.

Efforts have been made to solve the problem of poor performance in the internal and external examinations in Social Studies by different stakeholders in the education industry, but evidence shows that the problems are still prevalent in our schools (Oganwu, 2004). Adeyemi & Ajibade (2011) asserted that the uninspiring performance of students in examinations reveals that an innovative teaching strategy that is interesting to teachers and helps students achieve their goals should be adopted in Nigerian secondary schools. Researchers have indicated that innovative and productive instructional strategies of teaching such as simulation games, brainstorming, inquiry strategies, concept mapping, and modelling improve students' performance (Okonkwo, 2012). Furthermore, innovative instructional strategies and activity-based learning are useful instructional options to replace conventional lecturing (Zagona, Willis, & MacKinnon, 1996). It is an approach to instruction that uses the ill-structured problem as a context for students to acquire problem-solving skills and basic knowledge (Santanen, Briggs, & de Vreede, 2004). Indeed, the activity-based learning strategy goes beyond teaching students to acquire problem-

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solving skills, helping to increase understanding and knowledge through solving real life problems.

Simulation games are activities that involve rules, competition, and players. The result of the game is decided less by chance and more by judgments made by the players. As asserted by Adeyemi & Ajibade (2011), simulation games are board games or other types of games made by teachers that employ selected aspects of a real-life situation, usually focusing on the socio-political, religious, and economic facets of the society. Checkers, chess, Monopoly, Ludo, Snakes and Ladders, and Ayo are cited as examples of games that can be used for teaching purposes. Not only do simulation games permit students to discuss, deliberate, and make decisions, they facilitate the development of imagination. Generally, teaching students using the lecture strategy may not be enough to accomplish the required understanding and comprehension of the subject matter (Adelakun, 1997). Several studies (Adeyemi & Ajibade, 2011, Al-Zaytoonah, 2016, Sulaiman, Ibi & Bakar, 2016 and Vlachopoulos, & Makri, 2017) have highlighted the advantages and usefulness of simulation games, but none have addressed the challenges of matching the games to the standards-based curriculum and the varying needs of individuals, given reasons for use during extra-instructional time, or related the activity to topic understanding.

Problem Statement

Notwithstanding the increasing research interest on teaching strategies, it is obvious that a clear distinction is yet to be made about the specific teaching strategy that would address the challenges of unsatisfactory performance of students in social studies courses. Studies have revealed over the years that student-centred and participatory approaches to teaching and learning social studies were more effective due to the critical thinking and value-laden nature of the subject. However, there is hardly any consensus regarding the practicality and effectiveness of the various student-centred strategies in Social Studies classrooms.

Social Studies performance in Nigerian secondary schools has not been encouraging (Arisi, 2002). Adeyemi & Ajibade (2011) opined that if the concepts of social studies education are taught in secondary schools using innovative and productive strategies, it is expected that this will aid students to perform well and develop desirable attitudes. This study investigates the effect of simulation games on students' academic performance secondary school in Delta State and asks whether simulation games will improve the teaching of Social Studies, particularly at the secondary school level.

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Research Questions

This study was guided by the following research questions:

1. Is there a significant effect of simulation games on students' academic performance?
2. Is there a significant effect of students' gender on academic performance using simulation games?

Hypotheses

The following hypotheses were tested:

1. There is no significant effect of simulation game instructional strategy on students' academic performance.
2. There is no significant effect of gender on students' academic performance when exposed to the two strategies.

Literature Review

The Nature and Concept of Social Studies

The subject of Social Studies is defined in various ways. The National Teachers Institute (NTI) (2000) stated that social studies is the process of education that emphasizes the connection of human beings with their physical and social worlds; Social Studies can cultivate a sense of national cohesion, loyalty, and obligation to the nation. Mafuyae (1992) perceived that Social Studies touches the very core of our society. The subject deals with the important problems of national unity, economic development, and ethnic tolerance and international understanding. A broad view of Social Studies was presented by Shiundu & Ali (2000) when they described Social Studies as that aspect of school activity that includes the teaching of socially significant problems, questions, and topics believed to be relevant to the well-being of society. It is the development in the learner of the social and reflective thinking skills that would enable one to actively participate and effectively survive in the world through the rational collection, sorting, interpretation, analysis, and application of ideas (Mezieobi & Domike, 1996).

Simulation Game Instructional Strategy

A simulation game is a teaching activity designed to imitate a real situation in an interactive manner guided by rules and procedures. A simulation game, according to Angelides & Paul

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(1999), is often defined as a strategy of using an artificially initiated setting that copies chosen traits or characteristics of real states and situations and allows the participants to observe the outcomes of their decisions and take action accordingly. It is a methodology that endeavours to uncover certain fundamental structures in the environment by streamlining them so that attention can be paid to them. According to Rieber (1996), gaming components have a relationship with enjoyable activities that enable the flow stage. Thus, gaming activities have the ability to engage the learner to the flow stage and bring about better learning (Prensky, 2001), which, according to [Rosas et al. \(2003\)](#), increases students' motivation and achievement.

However, in spite of the positive educational benefits, this strategy still has shortcomings. Although promising, the utilization of simulation games presents several challenges. Squire (2004), in his investigation on the usefulness of simulation games in teaching, revealed that, although useful, it led to several contradictions owing to the complex character of the game, the long time required to play, students having difficulty learning how to use the game, and different levels of personal motivation.

Concept of Academic Performance

According to David (2007), academic performance denotes the performance by individuals' objectives as identified with different sorts of learning and skills varying based on individual education, socialization, capability, and qualification. In the same manner, Bourne (2004) opined that academic performance largely refers to a child's performance in academic areas such as reading or language arts, science, and history. Further, emphasis is customarily on the skills the student is expected to master in each major subject: reading and language arts, writing, mathematics, science, history, etc. Academic performance is posited by Grobe & Bishop (2001) as something one does or achieves at school, college or university, in class, in a laboratory, library, or field work. Additionally, according to Broussard (2002), academic performance is assessed by the utilization of instructors' evaluations, tests, and examinations. One may deduce that academic performance is the measurement of progress and success that one is able to attain as a student after years of varying learning experiences.

Simulation Games and Academic Performance

Noted by Anikweze (1992), the use of the simulation game as a teaching strategy challenges learners, adds interest, boosts activity, and adds uniqueness and innovation to the lesson. It makes possible the development of students' creative ability and allows students to discuss and make realistic judgements or decisions. It is seen to be highly exciting and motivating to students.

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Hursen & Asiksoy (2015) examined effects of the simulation game method on students' academic outcome in physics. Seventy students participated in the study, and the instrument for the study was instructional transaction. The study discovered that simulation methods improved students' academic success. Ogosi (2015) investigated the effect of games on pupils' achievement in reading. Sixty young pupils participated in the quasi-experimental study; the result showed that teaching through games enhanced achievement. Interestingly, the pupils' genders influenced their achievement. Soomro (2016) examined the usage of educational games on students' knowledge and mastery of clinical skills in health sciences. The results suggested that educational games and simulations increased students' knowledge and skills. Sulaiman, Ibi & Bukar (2016) studied the effect of simulation methods on students' academic performance using a quasi-experimental design. A sample of 90 students took an achievement test to generate data for the study. The study revealed that simulation methods significantly enhanced students' performance. Gruss (2016) determined that games enhanced the teaching of vocabulary. Al-Zaytoonah (2016) examined the effectiveness of educational games on students' performance in science. Results indicated that educational games significantly improved students' performance in science and that gender did not influence performance. Iwuanyanwu (2016) determined the efficacy of simulation games on students' performance in biology in Zaria, Nigeria, through a quasi-experimental study of 153 students. The findings demonstrated that simulation games improved students' performance when compared with the lecture method; gender was not a significant factor. Fatokun, Egya & Uzoechi (2016) investigated the effect of games on chemistry students' achievement on the Periodicity Achievement Test (PAT). The results indicated that game strategy enhanced students' performance; gender had no effect on achievement. Vlachopoulos & Makri (2017) focused on the impact of games and simulation on achieving specific learning tasks/objectives. The results indicated that games and simulations were of positive effect on learning goals. Kornak-Bozza (2017) looked at effects of computer simulation on students' self-efficacy. The result of the study demonstrated that computer simulation impacted the students' abilities in chemistry.

However, other researchers have established that students' performance does not necessarily improve when simulation games are used. Akinyemi (1997), in his study to ascertain the efficacy of scientific games in chemistry, discovered that there was no effect of games on students' performance compared with the lecture method. The control group and experimental group performed similarly pre- and post-experimentation. Studies also pointed out that while skills-oriented games can be useful and effective in promoting learning, findings are either not conclusive (Randel et al., 1992) or mixed (Cruickshank & Telfer, 1980).

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Theoretical Framework

This research work is anchored on the attribution theory of Heider (1958). The theory integrates self-efficacy and cognitive theory. The theory proposes individual attempts to explain success (good performance) or failure (bad or unsatisfactory performance) of others and self by advancing certain attributions that are either external (outside) or internal (inside) and may or may not be under one's control. While some students seem enthusiastic or passionate about learning, many need and expect their instructors/teachers to invigorate and inspire them. Effective and productive classroom learning, according to the theory, is determined by the teacher's capacity to maintain or sustain the interest that first led students to the discipline. According to Heider (1958), the level of motivation or enthusiasm students bring into the learning environment will be transformed for better (satisfactory performance) or worse (unsatisfactory performance) by whatever transpires in the classroom. Furthermore, the theory postulates that when learners perform better at an academic task, they attribute this success to their own determinations and capabilities, but when they fail or have difficulty, they blame factors that they are unable to control such as ineffective or bad teaching. It is important for teachers to use the most productive strategies or pedagogies for all students.

This theory is strongly linked to the present study in that students learn best as they actively construct knowledge through their interactions with different social studies teachers, which team teaching readily provides. Most students respond positively to a subject taught by a passionate teacher with genuine concern for students and the substance of learning. Thus, the activities undertaken and the instructional strategy used for learning will also improve students' learning and motivation.

Methodology

Research Design

The study employed the quasi-experimental, pre-test/post-test control group, 2 x 2 factorial design. The instructional modes include simulation games (SG) as a treatment, while the lecture strategy was used as the control group. The design of the study means that there were the following:

1. a pre-testing of all groups
2. treatment administered on the experimental group only

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3. observation of differences (if any)

The design is spelled out below:

Experimental Group - $O_1 X_1 O_2$

Control Group - $O_3 - O_4$

As specified earlier, treatment was administered to the experimental group while there was no treatment of the control group. Consequently, differences noticed in post-test performance were credited to the effect of treatment.

Population of the Study

The targeted population of the study included all Upper Basic 2 (JSS II) students in Delta State, Nigeria. In making up the population of this study, a simple random technique was utilized to select four public secondary schools with a sample size of 451 Upper Basic 2 students in Delta State. It is from the targeted population that the sample was drawn.

Table 1

School Demographic Composition

S/N	Schools	# of students		
		Male	Female	Total
1	Westend Mixed Secondary School, Asaba	61	70	131
2	Oreki Secondary School, Oghareki	43	62	105
3	Ubeji Secondary School, Ubeji	41	52	93
4	Okpe Grammar school, Sapele	53	69	122
	TOTAL	198	253	451

Sample and Sampling Techniques

The sample for the study comprised of 116 Upper Basic 2 students were drawn from the four selected schools. First, the schools were stratified by school type (Mixed schools, All-girls and All-

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boys). Only co-educational schools were considered suitable for the study because students' gender was a variable under investigation. In other words, all single schools were eliminated from the study. Then, using the simple random balloting technique, four schools were selected from the 321 mixed secondary schools for the study. Two schools each were apportioned to the experimental groups and control groups through the balloting method. From each selected school, one intact or regular class was selected for the study and assigned to treatment groups or control groups. The intact classes were categorized A, B, C, and D. Classes A and B were the experimental groups taught using the experimental strategy (simulation games) and classes C and D were the control groups taught using the lecture strategy.

Table 2

Sample Demographic Composition

S/N	Schools	Participants		Treatment
		Male	Female	
1	Westend Mixed Secondary School, Asaba	15	15	Control
2	Oreki Secondary School, Oghareki	13	14	Simulation game
3	Ubeji Secondary School, Ubeji	14	15	Control
4	Okpe Grammar school, Sapele	13	17	Simulation game
	TOTAL	55	61	

Research Instrument

The instrument used in the study was an achievement instrument, the Social Studies Achievement Test. The test comprised of 50 multiple-choice items selected from past Upper Basic School Certificate Examination questions and was based on the Upper Basic 2 Social Studies syllabus on three content areas: Drug Abuse, Drug Trafficking and Health Issues, and Harmful Substances.

Validation of Social Studies Achievement Test (SSAT)

The validity was based on expert judgment and table of specification. Validity was done to confirm the suitability of the items with the table of specification and to ensure that the items dealt with the subject matter content.

Reliability of the Instrument

To establish the reliability of the instrument, 30 students from a secondary school were used for the first and second administration. The test-retest method was used to establish the reliability of the instrument. The Pearson Product Moment correlation coefficient (r) was employed to test for the reliability and a value of 0.79 was obtained, which showed a high consistency value and therefore suitable for this study.

Administration of the Instrument

After the selection of the students for the study and assigning methods, the Social Studies Achievement Test (SSAT) was administered as a pre-test. This was followed by the teaching of the topics as contained in the syllabus using the designated instructional treatments over a period of six weeks. The experimental groups and control groups were taught by research assistants. In this regard, Social Studies teachers of the various schools were involved in the experimentation.

Treatment/Intervention Procedure

The experimental group students attended the social studies classes three days a week with each session lasting about 120 minutes. Participants were pre-tested (SSAT) to ascertain the level of students' performance in social studies before treatment. After the pre-test, simulation games were experienced with the students for six weeks. The post-test was used to ascertain the level of students' performance after six weeks of experimentation.

The students in the control groups were taught with the lecture strategy only and were given pre- and post-tests. Teaching and test administration took place concurrently in the four schools. To monitor the experimentation, the researchers went to the schools for supervision.

The Simulation Game

In the board game used for the study, the students threw the dice on the surface of the board one after the other. Each number that falls on the ladder is an automatic step to move forward

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to the direction of the ladder. Each number that falls on the arrow will follow the direction of the arrow either to move up or down. Game time for each set of players is 15-20 minutes. The players take turns throwing the dice. One of the players put the scoring tablets at the appropriate cell space until one of the two parties enters the Gold Space. The winner is the player who first enters the Gold Space with the highest score. After the game, students work on a quiz to assess the different learning objectives. Students reflect on their experiences through group discussion or as a written assignment.

Data Analysis

The data were analyzed using mean and standard deviation for all research questions while analysis of covariance (ANCOVA) was used to test the hypotheses at 0.05 level of significance.

Results

Research Question 1

Is there a significant effect of simulation games on students' academic performance?

Table 3

Descriptive Statistics of Pre-test and Post-test Scores of Students taught with simulation Game Strategy.

Teaching Methods/Treatment	Pre-Test			Post-Test			Mean Gain
	N	\bar{X}	SD	N	\bar{X}	SD	
Simulation games (E)	57	53.43	12.05	57	70.79	11.95	17.36
Lecture method (control)	59	46.50	12.18	59	54.27	10.81	7.77
Total	116	49.97	12.12	116	62.53	11.46	12.57

Table 3 shows that at pre-test, the mean performance scores of the students in the experimental (treatment) groups and control group were 53.43 for E and 46.50 for the control group with standard deviations of 12.05 and 12.18, respectively. There were not many differences in the variability of their scores judging from the closeness of their standard deviations. However, at post-test, the treatment group had mean achievement scores of 70.79 and standard deviations of 11.95, while the control group had an overall achievement mean score of 54.27 and a standard

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deviation of 10.81. This result indicates that the experimental group achieved higher than the control group. In effect, the simulation games instructional strategy proved superior to the lecture method in enhancing students' achievement in Social Studies.

Hypothesis 1

There is no significant' effect of simulation games instructional strategy on students' academic performance.

Table 4

Summary of ANCOVA on Effect of Simulation-games on Students' Academic Performance.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5475.024	1	5475.024	34.244	.000
Intercept	692315.024	1	692315.024	4330.149	.000
SIMULATION	5475.024	1	5475.024	34.244	.000
Error	28459.087	114	159.883		
Total	754668.000	116			
Corrected Total	33934.111	115			

Table 4 shows that simulation games had a significant effect on students' performance. Data revealed that the effect of simulation games on students' performance was significant ($F(1,114) = 34.244, p = 0.000$). Therefore, the null hypothesis of no effect of simulation games on students' performance was rejected.

Research Question 2

Is there significant effect of students' gender on academic performance using simulation games?

Table 5

Descriptive Statistics of Pre-test and Post-test Scores by Gender.

Strategies	Gender	Pre-Test			Post-Test			Mean Gain
		N	\bar{X}	SD	N	\bar{X}	SD	
Simulation Game	Male	25	50.27	12.971	25	71.89	10.94	21.62
	Female	32	53.50	0.8	32	69.69	12.97	16.19
Lecture (Control)	Male	30	45.13	9.55	30	54.90	13.89	9.77
	Female	29	49.13	13.3	29	53.64	11.47	4.51
Total	Male	55	47.70	11.26	55	63.40	12.42	15.70
	Female	61	51.32	12.05	61	61.67	12.22	10.35
	Total	116	49.51	11.66	116	62.54	12.32	13.03

Table 5 shows that male students had a mean of 47.70 and a standard deviation of 11.26 in the pre-test and a mean score of 63.40 and standard deviation of 12.42 in the post-test, a gain of 15.70. The female students had a mean score of 51.32 and a standard deviation of 12.05 in the pre-test and a mean of 61.67 and standard deviation of 12.22 in the post-test, a gain of 10.35.

The result, therefore, revealed that at post-test, male students performed better in simulation games, with mean scores of 71.89 greater than the grand mean scores (62.54) and a mean gain score of 21.62 better than the grand mean gain of 13.03. The result also revealed that male students with mean scores of 63.40 and mean gain of 15.70, which is better than the grand mean scores and grand mean gain of 62.54 and 13.03, respectively, performed better than the female students with mean scores of 61.67 and mean gain of 10.35, which is lower than grand mean scores and grand mean gain of 62.54 and 13.03.

Hypothesis 2:

There is no significant effect of gender on students' academic performance when exposed to the two strategies.

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Table 6

ANCOVA of Effect of Students' Achievement Score by Gender when exposed to the two strategies.

Source	Type III Sums of Squares	df	Mean Square	F	Sig.
Corrected Model	300.188 ^a	1	300.188	1.589	.209
Intercept	720616.988	1	720616.988	3813.704	.000
Gender	300.188	1	300.188	1.589	.209
Error	33633.923	114	188.955		
Total	754668.000	116			
Corrected Total	33934.111	115			

Table 6 shows that the effect of gender on students' academic performance when exposed to the strategies was not statistically significant ($F(1,114) = 1.589, p = .209$). Boys and girls did not perform differently. Thus, the hypothesis was accepted with a decision of no effect of gender on students' academic performance when exposed to the two strategies.

Discussion of Results

Instructional Strategies and Academic Performance

Simulation games were found to be more effective than lectures. Students taught using simulation games improved more than those taught with the lecture strategy (control group students). This means that simulation games are most likely of equal usefulness and effectiveness, but significantly better than the lecture instructional strategy in enhancing performance. This result, therefore, gives further credence to Ogosi (2015), Al-Zaytoonah (2016), Sulaiman, Ibi & Bukar (2016), Vlachopoulos & Makri (2017), and Kornak-Bozza (2017) on the effectiveness of simulation games on academic performance. Furthermore, the results of this study support Hursen & Asiksoy (2015), Fatokun, Egya, & Uzoechi (2016), and Iwuanyanwu (2016), who reported that students exposed to simulation games performed better than those exposed to the lecture instructional strategy; however, the results are at variance with Akinyemi

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(1997), Umo (2001), and Cruickshank and Telfer (1980), who reported that simulation games are of no effect on the academic performance of students.

Gender and Students' Academic Performance

Results from data collected showed that there was no significant effect of gender on students' academic performance. This result is consistent with the findings of Fatokun, Egya & Uzoechi (2016), Iwuanyanwu (2016), and Al-Zaytoonah (2016), who reported that gender does not have any significant effect on students' performance. This result is at variance with Adeyemi & Ajibade (2011), Okonkwo (2012), and Ogosi (2015), who reported a significant effect of gender on students' performance. Male and female students' performance was equally enhanced in this study because simulation games and brainstorming instructional strategies are not sex-stereotyped. Therefore, a gender-balanced atmosphere accounted for the superiority of these two experimental strategies in enhancing performance over the lecture strategy.

Conclusion

The study established the effectiveness of the simulation game in improving students' academic performance. The study concluded that simulation games significantly enhanced students' performance in social studies when compared with the lecture strategy. If simulation games are utilized in the teaching of social studies, teachers could be aided in providing a stimulating learning environment and students are likely to improve in their academic performance. As long as simulation games provide equal opportunities for the students irrespective of gender, students' academic performance is likely to be the same.

Recommendations

1. Educational authorities in Nigeria should reconsider the instructional strategies used in Social Studies teaching and learning.
2. Social studies educators and curriculum planners should incorporate innovative problem- and activity-based instructional strategies like simulation games in institutions preparing teachers.
3. Since gender had no significant influence on students' academic performance, school administrators should be conscious of other factors that can improve the students' academic performance.

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