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**Efficacy of innovative instructional strategies: effect of learning games strategy on students' learning outcome in social studies classroom**

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## **Efficacy of innovative instructional strategies: effect of learning games strategy on students' learning outcome in social studies classroom**

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**Abstract:** In this study, it was examined whether the innovative instructional strategy of learning games would significantly increase students' learning outcome in the experimental groups and control groups. The study is a quasi-experimental research, which examined the effect of learning games instructional strategy on students' learning outcomes in eight upper basic classroom settings. The study sample comprised of 192 students randomly assigned to the intervention and control groups. The instrument employed for the study was a learning outcome test instrument which comprised of 50 multiple-choice questions. Hypotheses were tested using ANCOVA. After experimentation, the results showed that students instructed using learning games had improved learning outcomes in comparison to those instructed with the lecture strategy (control group). There is no statistically significant influence of gender on students' learning outcomes. This study provides empirical evidence of the efficacy of using learning games instructional strategy in boosting students' learning outcomes.

**Keywords:** efficacy; learning games; instructional strategies; innovative instructional strategies; social studies; learning outcome.

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### **1 Introduction**

A tenacious concern in learning is the way to attain a better learning outcome and to decrease the number of students' dropout in schools, and accomplishing these aims might entail a change in the adopted teaching techniques and methods. Instructional strategy plays a significant role in students learning outcome. Adedaja et al. (2013) asserted that there is inadequate teaching of school subjects. With the recent changes in social studies curriculum in Nigeria, the teacher-centred or lecture strategy is still commonly used in

social studies classrooms [as reported by the studies of Jimoh (2012), Abdu-Raheem (2012) and Arinze and Ezeuzo (2014)]. The lecture teaching method is that in which transmission of knowledge is one-sided; that is, from the teacher to the student and that the technique is that of chalk and talk method. It emphasised memorisation and recitation of facts by the learners.

Moreover, this method has no lasting effect on learners. Arinze and Ezeuzo (2014) explained that in the lecture teaching method, learners are passive and are collectors of information that is reclaimable when the teacher needs it from them. In this strategy, the instructor turns into the explainer and practice master or ace. In contrast, the students are inactive and are receivers of facts. Therefore, it is pertinent to identify effective strategies teachers may utilise to contribute to improving students learning outcome, specifically struggling students whose learning outcome is unsatisfactory (lower than 60%).

Researches have indicated the usefulness of innovative instructional strategies such as learning games (LGs) in improving students' learning outcome (Anyichie and Onyedike, 2012). Hence, Al-Tarawneh (2016) stated that the application of LGs in the classroom gives the students a clear understanding of the content that is very difficult to comprehend using the lecture teaching strategy. Specifically, LGs have the potentials for helping students to improve learning outcome than the conventional instructional method. Boosting learning outcome shows that innovative instructional methods are not just for problem-solving. They assist students in securing problems-solving skills and increase their understanding through unravelling real-life situation and achieve a better learning outcome.

Traditionally, LGs connote unimportant activity, exercise or venture. It is in line with this description that several teachers' express shock or surprise when they hear the phrase game. Teachers feel that games are only useful for amusement and not for academics, and therefore, believe that time that engaged for teaching is a waste in education (Dempsey et al., 1996). Hence, the belief that LGs are exclusively not for instruction. Nevertheless, what precisely is meant by LGs?

LGs are usually applicable for teaching ideas, concepts, basic rules and principles which are not merely observable (abstract ideas). They are active techniques useful for teaching concepts, ideas, challenges, topics, and realities. LGs are teaching activities which involve rules, competitions and players (Moore, 2015). The learning outcome of the game is determined less by coincidence and by players' judgment. LGs are that which make provision for a simulated environment to play. Non-LGs involve solving problems in a school subject through the use of subject principles. LGs are highly motivational to students, and they bring about an increase in interest when in use.

However, there are proofs that LGs are hardly employed by Social Studies teachers, even with its numerous merits or advantages (Obeka, 2007; Akinsola and Animasahun, 2007; Longjohn, 2009). A shocking revelation or admission by Aremu (1999) is that most teachers unfluctuating specified that the LG strategy is not useful for the attainment of instructional and educational goals.

On the reality that gender (male and female) of students may influence students' learning outcome, gender in this study is used as a moderator variable. Timayi (2016) highlighted that research on gender influences on students' learning outcomes has led to a considerable body of literature. The significance of investigating instructional method with gender is mainly because of the cultural and social differences between female and male (Abra, 1991). Traditionally, in Nigeria society, girls' have been encouraged to conform to boys' superiority, where boys are given the training to be active and dominant

adventurers. Atovigba et al. (2012) supported this assertion. They asserted that most boys have Legos (toys comprising of plastic building blocks and other features), trucks, and model that improve their intelligence and ability. Girls games are most times highly controlled, requiring turn-taking and rules. Therefore, society expectations and conformity demands may give rise to cultural barriers to girls. Aside from this, conflicting findings have been shown on gender differences and students' learning outcome (Yang and Chen, 2010; Linderberg et al., 2010; Atovigba et al., 2012; Timayi, 2016). Therefore, this research regards male and female as a second-level independent variable to find out its influence on instructional method and students' learning outcome.

## **2 LG: conceptualisation**

The exact definition or conceptualisation of LG differs widely; however, one of its defining characteristics entails the utilisation of game features or components, such as reward systems, to motivate the players to participate in an undertaking they else would not find motivating or attractive. There is an unending discussion among academics and researchers about the precise definition of LG, particularly what is not a LG (Plass et al., 2015). LG is an activity of teaching intended to replicate reality interactively and regulated by procedures and rules. Okoye (1995) defined LGs as the concentration of imitation learning knowledge or experiences explicitly designed to represent and exemplify real-life circumstances by providing and offering the learner the needed foundations to model real-life situation and activity. This definition shows that LGs are forms of experiential or realistic learning and instructional settings where the learners are placed or positioned in a world defined and specified by the teacher. They exemplify reality within which learners or students interact or interrelate. Simultaneously, the teacher uses it to achieve the desired instructional results and likewise control this world's boundaries. According to Plass et al. (2015), LGs' conceptualisation customarily stresses that it is gameplay with well-defined learning outcomes. Ordinarily, there is an assumption that LG is a digital game, but the fact that it is not always the case. The outcome of this conceptualisation of LG is that the design or construction process of a LG for teaching and learning encompasses balancing the necessity to cover the subject content with the need to give precedence to gameplay (Sung and Hwang, 2013).

Obeka (2007) asserted that LGs are real-life problems, events or situation, which generally include decisions; issues or problems, attitudes; beliefs, interactions and solving problems. LGs combine the characteristics of a game such as cooperation, rules, competition and players with simulation such as incorporating or bring in the critical elements or attributes of reality (Obeka, 2007; Akinsola and Animashaun, 2007). For Sowunmi and Aladejana (2013) LG is a superb alternative to the conventional lecture. To them, LG is an instructional strategy in which students learn through games and decision-making to an artificial real-world setting. LGs are active teaching and learning strategy; however, with implausible enhancement potential. LG is a system in which students or players compete in an artificial or man-made conflict, guided by rules, leading to a measurable outcome (Lameras et al., 2017). LGs have modifying techniques to suit the interest of children and adults, respectively. According to Okoye (1995), innovative games like LGs played in and outside the classroom enhance the mastery of a subject matter.

Traditional teaching strategies have been revealed to be useful, economical and effective (Swiderska et al., 2013). Conversely, they do not come according to Gipson and Bear (2013), encourage active learning that stimulates critical thinking and problem-solving skills. Traditional teaching strategies are not interactive, habitually lack motivation and activities due to their passive nature. Therefore, they suggested that teachers should not limit or restrict themselves to the conventional method of teaching. He further opined that they should complement their teaching methods with innovative instructional methods such as LGs during the teaching process.

Games and simulation are innovative pedagogies/teaching strategies in the context of this study because they are new and novel in Nigerian Social Studies classrooms. Thus, they are newly being used for teaching in the Nigeria classroom. They are also innovative because they are stimulating and are alternative instructional strategies that improve learning; which the traditional lecture-discussion instruction could not address. They are emerging pedagogies/teaching strategies reaching new contexts and the exciting innovation of engaging interactivity (Mozelius et al., 2017). According to Shahinaz and Mona (2017), they are innovative because they are sources of liveliness and activity for students'; thus, teachers make an effort to utilise them in the classroom. Equally, LGs are innovative teaching strategies because they stimulate critical thinking, enhance teaching and learning, confidence-building, and promote problem-solving skills (Anyanwu, 2014). These strategies help make teaching and learning atmosphere or environment conducive and improve students' learning levels never thought possible. Hence, LGs have been increasingly applied as a teaching strategy throughout the world (Moylan et al., 2015). LGs have been employed to enhance student learning outcome, develop teamwork skills, communication and interaction (Bodnar et al., 2016).

However, notwithstanding the several positive educational benefits or advantages, it still has some shortcomings. While potent and promising, the use of LGs has its weaknesses and challenges. According to Yeo et al. (2004), gathering and changing graphic in LGs does not enhance transfer, reflection, or understanding without anyone else's input. Janina (2016) verified games usefulness in English vocabulary. Analysis of data generated confirmed that games enhanced the teaching of vocabulary. Students gender was not statistically significant. Familiarising students with technology requires extensive time, which further delays learning. Modifying these differences poses challenges for teachers (Holmes and Gee, 2016).

### **3 Components/features of LGs**

- 1 stimulate active learners participation through interaction
- 2 provide instant feedback to learners
- 3 compress learning time by organising a succession of real-world experience, which includes learning opportunity
- 4 boosts short and long terms of knowledge retention
- 5 reduce risks which may be present in a real-world situation
- 6 provide learners with stimulation and enjoyment
- 7 competitive nature increases motivation and interest.

#### **4 Distinction between LGs, instructional strategies and learning strategies**

LGs are games designed with educational objectives, or which have educational value. They are designed to help the learner expand concepts, learn about certain subjects, and assist them in acquiring knowledge and skills as they play and reinforce development (Antonio, 2018). They are types of educational game which has well-defined learning outcomes. Generally, LGs are designed to balance subject content with the playing of the game and the player's ability to retain and apply the subject content to the real world.

In comparison, instructional strategies that are also referred to as teaching strategies direct the teachers' ways and approaches to accomplish the major goals of instruction. Instructional strategies are procedures used by teachers to help learners become strategic and independent learners. These strategies come to be learning strategies when students or learners individually select suitable ones and apply them effectively to achieve goals. Instructional strategies are procedures, and means of interacting, communicating, passing on and inculcating knowledge skills, and values (Akdeniz, 2016). Thus, they are approaches adopted by a teacher to explain the subject content to learners. Ogheneakoke et al. (2019) expatiated that instructional strategies are the overall plans or an all-encompassing pattern of activities, directed towards attaining a goal.

In contrast, learning strategies denote methods that students employ to learn. They are those methods and procedures utilise by learners to improve their learning (Hattie and Donoghue, 2016). This varies from techniques for enhanced memory to better learning or test-taking strategies. A learning strategy is a mental activity or event carried out by the learner to accomplish some desired objective and goal (Culatta, 2020). When students try to see how new concepts and ideas connect, attend to information, or try to link new information to previous knowledge, it refers to learning strategy. Learning strategies thus are an individual's method to complete a task. They are an individual's way of organising and utilising skills to learn content or attain other tasks more effectively and resourcefully in school. Learning strategies are strategies students use to help them in their learning process. They are specific steps, activities, or techniques utilised by students to improve their learning.

#### **5 Studies related to LG**

Ding et al. (2017) asserted that due to the challenges in defining, creating and measuring complicated variables, constructs and the subsequent results and reports, rigorous empirical studies on the effectiveness of LGs had been limited. Ugwuoke (2006) examined the effects of instructional games on English language students' performance in Santa Maria Primary School, Nsukka. She employed a quasi-experimental design. The sample involved 58 students. Her findings revealed that students with instructional games treatment had a better learning outcome. Obeka (2007) provided evidence on the effect of power LGs on the students' achievement in geography. The study was quasi-experimental. Results showed that power LGs had a significant impact on students' performance. Students gender had a significant effect on students' performance. Longjohn (2009) studied the outcomes of LGs teaching method on chemistry students' achievement in Rivers State. Results showed that students instructed with the LG method performed better than those tutored with the lecture method. The study also revealed that students' gender was a significant factor in students' achievement. Onwukwe (2010)

studied the effect of play simulation on chemistry students' progress. The study was quasi-experimental. A total of 370 students were sampled for the study. Findings showed that teaching play simulation has significant effects on students' achievement in chemistry. Results revealed that the effect size of play simulation on students' progress was 0.752. It also reported that there was no significant influence on students' gender on their achievement.

Odo (2009) conducted a study on the effects of games techniques and gender on students' learning outcome in Oral English in Nsukka, Enugu State. The study was a quasi-experimental study 44 students were the sample used in the study. It established a statistically significant games techniques effect on students' achievement in Oral English. Besides, gender was not significant. Furthermore, Abe (2010) looked at the impact of LG technique in English language learning on students' learning outcome in secondary school. The sample comprised of 60 students and ANCOVA was employed to analyse the data gathered. The result proved that showed that games technique was far better in comparison with the lecture technique in learning the English Language in secondary school. Van Wyk (2011) looked into the effect of team-games-tournaments on students' achievement in economics education. Result of the investigation disclosed that the students instructed using team-games-tournaments achieved significantly in the achievements test than the control group (CG). The result revealed an effect size value of 0.852. Also, students gender had a significant influence on the learning outcome of students. Ajai (2013) examined LGs and mock-ups effect on students' achievement students in geometry using 287 students. The study proved evidence that games and mock-ups boosted students' achievement and interest in geometry. Results revealed that the effect size of LGs and mock-ups on students' success was .80. Anyanwu (2014) demonstrated that LGs stimulate critical thinking, problem-solving skills and learning outcome.

Guy and Lownes-Jackson (2015) looked at computer simulation usage in comparison with student performance in traditional and distance learning. The study was a casual-comparative study. The results indicated that computer LGs were most effective when deployed as an enhancement to practical lectures and in hybrid environments. Computer LGs, according to the research, increased students learning outcome with a massive effects size of .88. Aydogmus and Senturk (2015) explored the effect of LGs technique on students' achievement. Using a meta-analytical analysis, it exhibited that LGs technique boosted performance than the traditional teaching technique. The effect size of LGs technique on achievement was .84. Janina (2016) verified the applicability of the utilisation of games in English vocabulary. Analysis of data generated confirmed that games boosted the English vocabulary. Besides, the results showed an effect of LGs in teaching vocabulary with a large effect size of .85. Farhan (2016), in a study on educational games and simulation effect on the learning of health sciences, found educational games useful and effective in boosting learners' skills and knowledge.

LGs often provide a safe atmosphere for students' learning, in that way, reducing nervousness and increasing willingness to interact, which directly affects learning outcome (Reinders and Wattana, 2015). Flores (2015) conducted an analysis of related reviewed literature and existing digital games to teach a second language. The study showed that digital games support a learner-centred teaching strategy, which stimulates intrinsic motivation compared to conventional teaching methods that often decrease students' motivation. The study further reported that more empirical studies are needed on the effect of LGs as a teaching and learning strategy for acquiring and developing a

second language. LGs, Nadolny and Halabi (2016) study revealed, increased students' level of involvement and activities in the learning content. Thus, stimulating motivation and learning even for different learners.

Shahinaz and Mona (2017) examined effect of e-games on students learning outcomes using (SOLO) taxonomy. The study involves 36 fourth grade students, and the research adopted the two groups experimental method. The study showed that there was an improved learning outcome in favour of the experimental group instructed using the e-games. Anurag et al. (2018) examined Android-based game intervention's effect on facial identification skills using 20 participants as the sample. The study demonstrated that participants in the intervention group improved their facial identification. Meryem and Ayşe (2018) explored effects of educational games on students' knowledge retention and academic achievement. Sixty-eight ninth-grade students made up the sample for the study. Result of the research demonstrated that educational games increase students' knowledge retention and learning outcome. They further reported that students found the educational games entertaining, informative and reinforcing their learning.

Cavalho et al. (2018) studied the contribution of board games to students' protein synthesis concept understanding. They established that board games enhanced students understanding of concepts. They concluded that board games with these features could be utilised as a didactic or educational tool in classrooms. Carew (2018) study with different student groups in several biology areas discloses that educational games can be employed to support traditional lecture teaching and students learning in the teaching process. A study carried out by Serrano (2019) on digital game learning on student skill development at the K-12 level, reported that digital game learning enhanced students' skills development. Tokac et al. (2019) looked at learning video games effects on mathematics PreK-12th grade students learning outcome. Results from the study indicated that video games showed slightly useful for teaching mathematics students across PreK-12th grades.

However, many studies found an insufficient relationship between LGs and learning outcomes (Berson, 1996). Researchers demonstrated that students did not differ in performance in the application of LGs. Akinyemi (1997) found out the effect of scientific games strategy in Chemistry discovered no effect of scientific games on students' performance. Control and experimental groups exhibited the same learning outcome, and an effect size of ( $d = 0.3153$ ) was reported. Study of Abdulmajed et al. (2015) reported that negative aspects of gaming such as strain result from repetitive motion, aggressiveness, hitting, funding, time and space. In the report of Tham and Tham (2014) and Gleason (2015), LGs were found not always to improve students academically. The study revealed that students showed no improvement in motivation and learning outcome when instructed using games. Hadi (2017) explored the effect of instructional video games on learners English vocabulary. The study involves 60 learners as the sample. The study found that instructional video games did not improve learners English vocabulary.

## **6 Theoretical context/framework**

The study is anchored on Bandura (2001), social learning theory and situated cognition theory, of Brown et al. (1989). Social Learning theory accentuates the significance of observation, reflection and demonstrating in the peoples' actions, emotions, perception, and reactions of others. Thus, it centres on learning by observation, reflection and



demonstration. Social learning theory elucidates how both reasoning and environmental factors act together to influence human knowledge and conduct. It focused on the learning that transpires within social scenery. As indicated by Bandura (2001), people learn from one another ideas through observational learning, imitation, and demonstrating.

Bandura postulated that the interaction of environmental factor determines students' learning outcome. Importantly, environmental variables or factors, specifically social support, can affect behaviour indirectly through an effect facilitated by personal factors, and vice versa and behaviour can, in turn, influence environmental and personal variables. Vicarious experience is a less authoritative source of efficacy information. It encompasses observing actions of others successfully without contrary consequences (i.e., social modelling). Mostly, people persuade themselves that if others can undertake a given behaviour, they too should be able to execute the same behaviour.

Situated cognition theory, of Brown et al. (1989), the second theory, postulated that learning occurs in an individual's daily life experiences. That learning is gradual, significant and meaningful when learning materials are embedded in personal connections and replicate real-life experiences. Students keep on academically when materials and classroom lessons are made applicable to the lived experience. Learning aligned with several of the proposed parameters by the situated cognition theory. LGs experience offers learning within a particular problem-solving setting, enabling learners to utilise their experiences and mistakes as a gauge for learning. In lots of cases, the games are related to real-life situations and experiences in the learners' environment.

## **7 Research questions and hypotheses**

The research focused on the cause and effect relationship. That is the effect of LGs on students learning outcome. Thus, the research construct and variables are LGs as the independent variable and learning outcomes as the study dependent variable. Gender was used as a moderator variable. Other constructs in the study though not measured, are competition, cognitive abilities, motivation, and learning outcome measures. Studies demonstrated the effect of LGs on students learning outcome among upper basic eight classroom setting. The first research question in the present research was whether LGs strategy leads to improved students learning outcome. The research also explored gender influence of gender on students' learning outcome and whether students differed by gender between the treatment and the control condition. The goal of LGs intervention is to boost students' learning outcome cognitive and social interaction learning. LGs stimulates learning outcome by enhancing active learning and having students learn through competition.

Consequently, generally, it may be anticipated that involvement in LGs condition results in increased students learning outcome. The hypothesis is that participation in LGs condition will not boost students' learning outcomes; students' gender will not influence their learning outcome.

## 8 Method

The present study measured the effect of LGs strategy on students learning outcome in upper basic eight settings. Therefore, the researcher adopted the quasi-experimental design that uses pretest-posttest and CG, where the experimental group was taught using LGs strategy, while the CG was taught using the traditional lecture strategy. This design was adopted because the independent variables cannot be fully controlled. An intervention group (experimental group) was employed for one group and compared to a second group. The use of an intervention and CGs was to help prevent threats to validity as well as the ability to adjust for confounding variables statistically. Intervention and CGs help to ascertain cause and effect, which the study is out to achieve. Besides, there was no randomisation of students, as this may disrupt the school system and organisation. Therefore, intact classes were assigned randomly to the experimental group and the CG, respectively. The design (quasi-experimental) was appropriate for the study since it was conducted using intact classes. More so, the manipulations and control of variables to ascertain cause and effect that the study deserved were achievable only by this design.

The factors studied are LGs strategy, which is the independent variable and learning outcomes, which is the dependent variable. These factors are essential in relation to theoretical position and help to build new knowledge because their investigation will give credence to the effectiveness or otherwise of these factors studies. Thus, they provide support or otherwise of the potency of these factors. The research report on these factors investigated in the study indicates the theoretical and empirical proof behind claims on the use of LGs in education. Games procedure was used to find the effect of LGs on students' learning outcome in social studies in the upper basic setting. The teaching strategies involve LGs which is the experimental group and traditional strategy, which is the CG. The experimental group received treatment by being taught using LGs, while the CG received no experimental treatment, as students' in this group were taught using traditional lecture strategy. The experimental/treatment and CGs were both subjected to pretest before the commencement of experimentation to get their baseline academic level. Posttest was also administered to both groups after the period of experimentation. From the posttest results of the two groups, learning outcomes were obtained, which is the dependent variable. Therefore, differences noticed in the posttest performance were attributed to the effect of treatment.

## 9 Participants

The sample of the study was 192 basic eight students from 24 different public schools. Learners were at the age of 12–14. All the participants are already extensively exposed to social studies curriculum contents; thus, they have been learning social studies for one or two years. They have been exposed to three social studies lessons of 40 minutes per week. All participants had no contact with social studies outside the classroom. The topics used were based on the school syllabus (health issues, drug trafficking and drug abuse). The groups were selected using stratification technique with no criteria set in advance relating to their skills, abilities or any other features.

The researcher's choice of upper basic eight was based on the fact that social studies are a core subject at the upper basic level. They are required to pass the subject before being awarded the Junior School Certificate. At upper basic eight students are already

extensively exposed to social studies curriculum contents and upper basic seven students are new and too fresh. That is, they have not been extensively exposed to social studies curriculum contents. Upper basic nine students are too busy preparing for their final examination to want to participate in the study.

The sample size needed to establish an effect in learning outcome (i.e., students' learning outcome score) was centred on 80% power with alpha levels fixed at  $p < 0.05$ . Grounded on prior studies, an effect size of  $d = 0.5$  (adjusted mean diff. of .25) was anticipated for the students learning outcome study. There was an adjustment in the power calculation using a correction factor of  $(1 - \rho) \times ICC$ , where  $m = 1/4$  students for each school and ICC  $1/4$  the intra-class correlation coefficient. Assuming eight students each from 24 schools were to be engaged, and an ICC of 0.07, a correction factor of 1.5  $[1 - \rho (8 - 1) \times 0.07]$ . Thus, the requisite sample size was ascertained to be 192 students from 24 schools.

The study involved four groups, A, B, C and D. Group A and B, which are the experimental groups played nine games focused on the topics selected for the study. Group A and B composed of 102 students; 50 males and 52 females. There were no students from single schools since gender was a moderating variable. Group C and D, which are the CGs, composed of 90 students (99 males and 51 females). There were no students from single schools. Relating to group C and D, it needs to be emphasised that the overall number of students in this group was lower in comparison with the previous group (12 students).

The study employed 24 schools chosen from 224 schools that provided expressions of interest in response to invitations sent to all 453 upper basic public schools in Delta State. To be qualified for the study, schools were obligatory to have at least 60 upper basic eight students to participate. Eligible upper basic schools were stratified based on school type (i.e., single or mixed), and location (urban or rural) to guarantee a representative and a sundry sample of schools for testing the effect of LGs. Resulting stratification, 24 schools were then selected randomly for the study. Eight mixed upper basic schools from the three senatorial districts in the state, within each SES categories (high, mid and low) and location (urban or rural schools) were selected. Students were randomly allotted by the researcher to one of two conditions, utilising an electronic random number generator. From the selected schools, 192 students partook in the study. Among the 192 students 102 (53.1%) students were assigned to the experimental condition (LGs), and 90 (46.9%) to the CG. In the study, 89 (46.3%) were male, and 103 (53.7%) were female.

**Table 1** Profiles of participants

<i>Groups</i>	<i>Female</i>	<i>Male</i>	<i>Total</i>
Experimental group	52	50	102
Control group	51	39	90
Total	103	89	192

## 10 Sources of data

The instrument employed for the study was a learning outcome instrument. The learning outcome test instrument (LOTI), comprised of fifty (50) multiple-choice questions. And each item or question of the instrument has five (A-E) options. The fifty (50)

multiple-choice items were selected from past ‘Junior School Certificate Examination’ questions as set by examination and standard of the Delta State Ministry of Education. They are based on social studies topics taught in upper basic eight during the period of experimentation or study. The content was from the curriculum. The test items were spread to cover the topics: culture, transportation and cultism.

In the test construction, a test blueprint was worked out. It was a table showing two dimensions; one contained the test objectives, the other the content to be tested. The table displays the number of items to be selected per topic and the percentages for each topic. In the preparation of the instrument, the researcher adopted educational testing service (ETS) taxonomy of learning objectives in the cognitive domain reasoning skills of levels of remembering (25%), understanding (50%) and thinking (25%) (R.U.T.). It depicts the cognitive ratio level of 1:2:1 as recommended for the Junior School Certificate Examination by the Nigeria National Board for Educational Measurement.

**Table 2** Test blue print for instrument – LOTI

<i>Topics</i>	<i>%</i>	<i>25% REMEMBERING</i>	<i>50% UNDERSTANDING</i>	<i>25% THINKING</i>	<i>Total</i>
Culture	40%	5	10	5	20
Transportation	30%	3	9	3	15
Cultis	30%	3	9	3	15
Total	100%	11	28	11	50

The test (instrument) reliability was determined using the test-retest method. It was pilot tested on 20 students. Pearson correlation coefficient was utilised to determine the LOTI items reliability. The calculated R-value obtained was 0.83.

The experiment lasted for five weeks. A lesson notes on each of the chosen topics was prepared and utilised to teach the experimental and CGs by the selected, trained social studies teachers in the selected schools. The teachers in the treatment groups were given both instructional packages, and copies of validated lesson notes. In contrast, only copies of validated lesson notes were given to the control condition/group teachers. The teachers administered the pretest and posttest to the students.

## 11 Procedure

The sample was group into four groups; groups 1 and 2 comprised of LGs (n = 102 students), group 3 and 4 consisted of CG (n = 90 students).

Students in the control and treatment group attended classes thrice-weekly of 40 minutes duration. Students were pretested (LOTI) to establish the level of their statistical performance before treatment. Afterwards, students compete in the LG for five weeks. Posttest was administered after the five weeks of intervention to determine the level of students’ learning outcome.

In the course of the investigation, to control for pretest in learning outcome differences, an interval of four weeks was allowed. Four weeks’ interval was well-thought-out to be neither too long nor short. This relatively short interval served to minimise and control pretest sensitisation likewise maturation effect was adjudged adequate in controlling pretest effect. Also, contents and (LOTI) were carefully matched

in difficulty, format, and number for both the experimental and control conditions. An equal expanse of lesson time was given to each experimental and control condition/group. There were reshuffling and ordering of pretest items on the posttest to give the impression that the posttest is different from the pretest.

Furthermore, different paper sizes were utilised for the typing of the pretest and posttest items. These precautionary procedures were implemented to prevent the students from becoming familiar with the test items or test wise. To circumvent bias in the study, the regular social studies teachers in the respective schools involved in the study were trained and monitored to certify that they efficaciously adhere to the study instructions. The circumventing of bias guaranteed that the observable effect between the intervention groups and control conditions was because of the treatments and not the teachers' efficiency.

## **12 Learning design for LG class**

In the LG strategy, students were instructed on the topics conventionally preceding the game exercise. Learners were given pre-game handouts a day before the actual gameplay to study at home and get used to the game's procedures and rules. The students were split into groups for the game after a short introductory lesson on the treatment or experimental day. The board game utilised for the LG exercise; the students tossed the die on a board surface in turns. A reward is steps and points move up when the number falls on a ladder. Those that fall on the arrow are to either follow arrow up or down. Time for a group of players is 10–15 minutes each. Students take turns tossing the die while group members place the scoring tab at the right board space until it gets to the finish spot, which is the gold/finish space. This exercise was then followed by a debriefing stage/session to emphasise the lesson's imperative points and activity and a quiz to evaluate the different stated objectives of the lesson. Students deliberate on the day's lesson through either group discussion or written class work and assignment.

## **13 Analysis**

Data gathered were analysed with descriptive statistics and ANCOVA at alpha 0.05. Since the study is an experimental study that involved pretest and posttest, ANCOVA was well-thought-out suitable because it helped control any initial differences between the groups. There is the likelihood that treatment effect could be affected by uncontrolled variables such as learners' motivation, intellectual capability, attitude, self-concept, social and economic factors. The sensitivity of ANCOVA would adjust or correct the early mean differences in the groups and control for difference beyond the range of the design.

## **14 Results**

Table 3 indicates that preceding the use of LGs (pretest) in the treatment group (experimental), the score was 50.82 while the standard deviation was 11.50. The CG has a pretest of 44.45 with standard deviations of 10.82. This is lower than that of the treatment group. But at posttest (after treatment), the mean scores for the experimental

group was 69.87 from 50.82. The posttest mean score shows a sizable increase from the pretest. It was also an improvement for the CG from a pretest score of 44.45 to 55.70. But equated with the experimental (treatment) group, it was low. The table also demonstrates that the mean gain difference was 19.05 for LGs strategy and 11.25 in lecture strategy. The mean score result indicates that students instructed with LGs strategy achieved better learning outcome than students taught with lecture strategy in social studies.

**Table 3** Students exposed to LGs strategy pretest and posttest scores

Strategies/treatment	Pretest			Post test			Gain
	N	Mean	SD	N	Mean	SD	
Learning games (E)	102	50.82	11.50	102	69.87	12.50	19.05
Lecture strategy (control)	90	44.45	10.82	90	55.70	11.01	11.25
Total	192	47.64	11.16	192	62.79	11.75	7.80

**Table 4** ANCOVA of LGs strategy on students' learning outcome

Sources of variance	Sum of square	DF	Mean squares	F	Sig.
Corrected/adjusted model	8,509.920	2	4,254.960	29.622	.000
Intercept	717,131.541	1	717,131.541	4,992.579	.000
STRATEGIES	8,509.920	2	4,254.960	29.622	.000
Error	25,424.191	189	143.639		
Total	755,668.000	192			
Corrected/adjusted total	33,834.111	191			

Table 4 demonstrates that LGs have a significant effect on students' learning outcome. Data in the table revealed that the effect of LGs strategy on students' learning outcome was significant ( $F(2,189) = 29.622, p = .000$ ). Thus, the no effect of LGs strategy on students' learning outcome null hypothesis is rejected.

**Table 5** Pretest and posttest scores in the two groups by gender

	Gender	Pretest			Posttest			Gain
		N	Mean	SD	N	Mean	SD	
Learning games strategy	Male	50	51.42	11.78	50	69.84	10.44	18.42
	Female	52	52.02	9.68	52	67.46	11.66	15.44
Lecture strategy (control)	Male	39	44.26	10.55	39	52.60	12.48	8.34
	Female	51	48.38	12.69	51	51.94	10.66	3.56
Total	Male	89	47.84	11.17	89	61.22	11.46	13.37
	Female	103	50.20	11.19	103	59.70	11.16	9.50
	Total	192	49.02	11.18	192	60.46	11.31	11.44

Table 5 indicates that the pretest mean score of students instructed with the two strategies (LGs – experimental group) and the lecture strategy (control) is 51.42 and 44.26 for male and 52.02 and 48.38 for female correspondingly. In contrast, the posttest scores indicate 69.84 and 52.60 for male and 67.46 and 51.94 for female in that order. These results suggest that in each strategy, students differ in their pretest and posttest scores. The

difference or variance is highest with LGs and lecture (control) strategy lowest. The mean gain differences are 18.42 for the LGs strategy (experimental group) and 8.34 for the lecture strategy; for the female, the mean gain scores are 15.44 and 3.34 in LGs strategy and the lecture strategy. The result further demonstrates that the difference in posttest mean score is highest among male and female students tutored with LGs strategy and lowest by those instructed with the lecture or control strategy.

**Table 6** ANCOVA of the influence of students' learning outcome by gender

<i>Source of variance</i>	<i>Sum of square</i>	<i>DF</i>	<i>Mean squares</i>	<i>F</i>	<i>Sig.</i>
Corrected/adjusted model	300.178	2	300.178	1.587	.208
Intercept	720,615.988	1	720,615.988	3,812.703	.000
Gender	300.178	1	300.178	1.587	.208
Error	33,634.923	189	188.954		
Total	755,678.000	192			
Corrected/adjusted total	33,855.121	191			

The result in Table 6 confirms that students' gender has no significant influence on students' learning outcome ( $F(1,189) = 1.587, p = .208$ ). It indicated that gender did not influence their learning outcome. Thus, hypothesis 2 was accepted. The result connotes that there was no statistically significant gender influence on students' learning outcome. The result also shows that teaching strategy and student gender do not significantly depend on each other in terms of Social studies students' learning outcomes.

## 15 Discussion

The result of hypothesis one indicates that the LGs strategy has resulted in better students' learning outcome. From the study result, it can be deduced that LGs enhanced students' learning outcome. LGs strategy was found to have improved students' learning outcome compared to the lecture or CG. To wit, those instructed with LGs strategy improved in their learning outcome when compared with those tutored with lecture strategy. This finding supports the studies of Reinders and Wattana (2015), Flores (2015), Shahinaz and Mona (2017), Anurag et al. (2018) and Cavalho et al. (2018) who observed that LGs stimulate and enhance students' learning outcome. Also, the finding of the study supports the works of Onwukwe (2010), Klisch et al. (2012), Sowunmi and Aladejana (2013), Ariffin et al. (2014), Chen et al. (2015), Tao et al. (2015), Gold (2016), Farhan (2016), Meryem and Ayşe (2018), Serrano (2019), Tokac et al. (2019) all of which found that the LGs strategy boosted students' learning outcomes after intervention or treatment. A probable justification for this is that with LGs learners improve their learning outcome because they actively and enthusiastically develop their knowledge, skills and experiences through observation, modelling, interactions and imitation. The students remember or recall better what they participated and contributed because they employ all the sense organs and hands in the learning process. However, the finding contradicts the findings and assertion of Berson (1996), Afuwape (2002), Riemer and Schrader (2015), Gleason (2015), Bolliger et al. (2015), Abdulmajed et al. (2015), Fu et al. (2016) and Hadi (2017); who reported that there is no effect of LGs strategy on the students' learning outcomes.

The result of data analysis in hypothesis two provided evidence of no statistically significant influence of gender on students' learning outcome. The result shows that female students' equally improved their learning outcomes with the male students when both were instructed with LGs teaching strategy. The result may be predicated on the fact that LG method is not sex-stereotyped, and also there is a gender-balanced atmosphere at the time of the experimentation. The finding of this study agreed with that of Onwukwe (2010), Komolafe and Yara (2010), Amosun (2011), Klisch et al. (2012), Ezeudo and Ezinwanne (2013) and Al-Tarawneh (2016); where no significant influence was observed between the male and female students' learning outcome. However, the finding of this study is in contrast with studies of Usman (2000), Obeka (2007) and Longjohn (2009) who documented the influence of students' gender on learning outcomes.

## **16 Conclusions**

It concluded that LGs strategy improved students learning outcomes. Thus, the study proved the effectiveness of LGs on students' learning outcome. The use of LGs teaching strategy enhanced learning outcome. It established that LGs teaching strategy advances Social Studies students' learning outcomes in upper basic eight setting. The study also ascertained that students' gender influence is not a factor in students' learning outcome. This finding means that students learning is enhanced and enriched when they are engaged using LGs irrespective of students' gender. Thus, LGs teaching strategy is gender-friendly.

## **17 Implication**

Findings emanating from this study and the conclusion drawn from them provided several useful information that could help improve learning outcomes in upper basic Social Studies setting. One observable implication of the study rests on confirming that activity-based strategies such as LGs are better than the lecture teaching strategy in improving students' learning outcomes. Teachers should be encouraged to utilise LGs strategies for teaching. The fallouts of this study also indicate that LGs strategy can be effectively utilised within the regular class lesson. This has implications for planners of the curriculum who should carefully appraise the school programme content and implementation strategies and ensures that adequate provision is made to use these innovative, activity-based, problem-solving strategies. When used as a teaching strategy, LG boosted students' learning outcomes at the upper basic setting. If LGs are to be effective teaching strategy, subject objectives must be directly linked to the game. A direct alignment is needed between the games, feedback, assessment and learning outcomes.



## **18 Recommendations**

- 1 The use of LGs should be encouraged and stimulated as it empirically proves that it enhances students' academic performance.
- 2 Regular workshops, seminars, and conferences should be organised for all Social Studies teachers to train them and enhance their use of LGs in the teaching process.
- 3 Attention should not be on gender in utilising LGs strategy since students' gender is not a factor in students' performance.

## **19 Limitations**

This study has certain shortcomings or limitations. First, in conducting the research, the regular teachers were used. Personalities of these teachers were not considered, and these could have influenced the study results. It must be appreciated that this study was conducted with a limited sample of 192. These may not allow for broader generalisation of the findings of this study. Though lasting five weeks, the treatment period was essentially restricted to the teaching period as spelt out in the school schedule and timetable. It is to make certain that the study did not disrupt the regular classes of the school system. The content taught was also limited to what is stipulated in the syllabus just to ensure that nothing disrupted the smooth running of the cooperating schools. It is believed that the application of more units of instruction might make for a better generalisation of the result of this research.

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