

**EFFECT OF USING MULTIPLE REPRESENTATION STRATEGY IN SOCIAL STUDIES  
INSTRUCTION ON STUDENTS' LEARNING OUTCOME IN JUNIOUR SECONDARY SCHOOLS,  
LAGOSSTATE, NIGERIA**

**BY**

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**Abstract**

*The study investigated the effect of multiple representation strategy in social studies instruction on students learning outcome in Lagos State junior secondary school. The objective of the study is to determine whether Multiple Representation Teaching Strategy (MRTS) is effective in enhancing students' learning outcome in Social Studies. Two hundred and seventy students in JSSII intact classes were used as sampled. The participants were drawn from four schools located at Ojo zone in Education District V. One hundred and thirty-one students were taught with MRTS and One hundred and thirty-nine students were taught using conventional method. Gender was the moderating variable and was considered as factor that can influence students' learning outcome. Two research questions were raised and two null hypotheses were formulated to guide the study. The study employed a quasi-experimental research design. The design employed a 2x1x1 factorial matrix. The Social Studies Achievement test was used to collect data for the study. Data collected were analyzed with mean, standard deviation and t-test using SPSS 23.0 at 0.05 significant level. Findings revealed that students treated with Multiple Representation Teaching strategy performed academically well [ t (142) = 13.917; p<.000], and that gender is a factor in using MRTS in Social Studies class [t (283) = 13.917; p=.000] The study concluded that MRTS was effective in enhancing efficient learning outcome in Social Studies. The study recommended that large scale further application of the therapy should be employed in general at Lagos State junior secondary schools.*

**Keywords:** *Multiple Representation strategy, Social Studies, Instruction, Conventional strategy, Learning outcome*

**Introduction**

Social Studies as a subject in the junior secondary school is designed to equip learners with desirable attitudes, values, skills and knowledge for unified social existence in the Nigerian society (Mezieobi, 2011). Within the school programs, social studies provide co-coordinated systematic study drawing upon such disciplines as anthropology, archaeology, economics, geography, history, law, political science, religion etc as well as appreciate content from the humanities, mathematics and natural sciences. It is a multidisciplinary study of a topic, a problem, an issue, a concern or an aspiration (Ogundare, 2000). Teachers in the Social Studies class always look for innovative ways and instructional methods to help students improve learning and also for motivational or attitudinal outcome in the subject matter. Learning is a determined, cognizant and multifaceted process (Ahmad, & Munawar, 2013). An important feature of learning is that it involves a complex interactive system including environmental, social, motivational, emotional and cognitive factors (Byrne, 2003; Huffman, 2004; Joyce, Weil & Calhoun, 2004 in Ahmad, & Munawar, 2013). Various teaching-learning strategies have been developed to accelerate learning process of students. In Nigeria at present, most behavioral practices in vogue in schools are situations where students are passive during instruction and the classroom environment is mostly teacher dominated (Emaiku, 2013).

The effect of teaching methods on students' performance is receiving considerable attention from educators and researchers worldwide. What students learn is greatly influenced by how they are taught (Abdu-lhamid, 2013). According to Emaikwu (2012), there has been drastic reduction in the standard of students' performance at all levels of education in Nigeria in the past decades. The reduction in the standard of education is traceable to many factors which are rooted in psychological and environmental factors. This fall in quality of performance at secondary school level is incontrovertibly attributable to instructional methods adopted by teachers in schools. Squeira (2012) stressed that learning through some methods is passive rather than active. Educators and researchers have repeatedly acknowledged the drawbacks in teaching with a strict lecture format. Teaching methods according to Hassan (2002) are the approaches, ways and strategies that a teacher adopts in conducting his lesson to a successful end. Mamman (2002) also defines teaching methods as the ways of teaching which involve a series of teacher directed activities that result into pupils' learning. Teaching methods comprise of principles and strategies used for instruction (Daluba, 2013). Teaching methods are the tools used by the teacher for reaching the set goals and objectives.

Learning strategies are activities that students employ to improve their learning of new information (Liu, 2009). Harrison, Andrews, and Saklofske (2003) suggested that students who employ appropriate learning strategies during academic tasks work more effectively than students who do not. There are various learning strategies that are used in social studies classrooms to help students overcome some of the difficulties of learning.

It has been observed that students in social studies classrooms normally show satisfaction in visual or concrete representations, while others showcased symbolic or abstract representations. Actually, students with high problem-solving capabilities usually demonstrate enormous skills in solving immediate problem through manipulating their language translation and representations (vocal), picture representation (picture, graphic) and formal representation (sentence, phrase, rule and formula) (Kohl & Finkelstein, 2004). On the other hand, students with low problem-solving abilities are always having difficulty with translation and representation in problem solving. Furthermore, different students have different learning styles for acquiring knowledge. It is therefore, better for teachers to adopt different teaching strategies to promote students' performance. Multiple representations are one of such strategies for enhancing learning performance of students (Cai & Hwang, 2002). Multiple representations can be developed to address specific learning difficulty among students and to address difficult concepts in social studies (Hinrichs, 2005; Jimenez & Perales, 2001; Savimainen Scott & Viiri, 2005). The use of multiple representations in solving social studies problems have been of great interest to social studies education researchers (Neugen & Rchelio, 2011). Some of these social studies education researchers have carried out studies that addressed the benefits of using different representations in solving various social studies problems (Lesne & Gire, 2005; Van Henvelen & Zou, 2001) and pedagogical aspects or helping students construct representations (Meltzer, 2005). Rosengrant & Finkestein (2006) and Van Heuvelen & Etkina (2006) specified that student's performance in similar problems posed in different representations might yield significant different results.

It is believed that one of the great performances of social studies education is to enable students use their knowledge in solving problems. Many researchers according to Gok & Silay, (2010) and Selcuk, Caliskan & Erol, (2008) have found that many students do not solve problems at the wanted level of proficiency, even though there were improvements on the development of effective social studies problem-solving strategies. Most efforts then had been to identify differences between experienced and inexperienced social studies problem solvers. The differences had been in the manner and approach in which the different social studies groups solved problems. While the experienced social studies problem solvers have substantial training in social studies and consider a qualitative analysis of problem before embarking in quantitative analysis (Yerushalam & Magen, 2006), the inexperienced solvers have little or no deep knowledge about social studies and quickly involve in quantitative expression, a technique that involves haphazard society problems and solution patterns (Pol, 2005), and because of these differences inexperienced social studies problem solvers often fail to solve problems at less than the required proficiency level (Gok & Silay, 2010; Pol, 2005).

Nugen and Rebello (2007) concluded that students had difficulties in representing concepts. The difficulties are in transferring their problem-solving skills across representations. However, students improve in their ability to transfer across representations as they solve more problems in different representations (Nugen & Rebello, 2011). There are three major functions that multiple representations play in learning situation. These, according to Ainsworth, (1999) are to complement, to constrain and to construct. The first purpose of multiple representations is to use representations that provide complementary information or support complementary cognitive processes so that learners can reap the benefits of the combined advantages such as using both diagrams and verbal-textual representations. The second function is to use a familiar representation to constrain the interpretation of a less familiar representation so as to help learners develop a better understanding of the domain. The third function of multiple representations is to encourage learners to construct a deeper understanding of a phenomenon through abstractions of extension from and relations between the representations.

Multiple representations provide new opportunities to engender students' motivation, interest and understanding and are vital to the communication of social studies concepts. Social studies teachers can use a wide array of graphs, symbols and diagrams to describe and solve problems. Textbooks and classroom visual materials typically contain numerous charts, graphs, diagrams, equations and images. However, effective social studies education requires a clear appreciation of the role of multiple representations, how students interact with them and the impact of these representations when students solve problem. Students engage with a variety of different types of multiple representations and each representation needs to be interpreted and then combined with other representations to develop an in-depth conceptual understanding. They must, in turn, represent their understanding as a means of communicating what they learned. Many reasons account for poor learning outcome in social studies as described by

researchers. Researchers like Obioma, (2005); Okereke (2006); Imoko & Agwagah (2006); Iyekekolor, (2007); and Anyagh & Okwu, (2010) have identified curriculum, examination bodies, teachers, students environment, textbooks, lack of interest on the part of the students, incompetent teachers, the perception that a subject is difficult, large class syndrome, psychological fear of the subject, poor methods of teaching and lack of qualified teachers as factors responsible for students' low interest and poor performance. Oviawe, Ezeji & Uwameiye (2015) identified poor teaching approach and instructional strategy; lack of confidence in the subject (Abkpa&Iji, 2011) and poor learning environment as reasons for students' under performance in social studies (Olunloye, 2010).

As it could be inferred from the above, few studies have been conducted on the relationship between all of these constructs. In this regard, this study aimed to contribute to the existing knowledge particularly in the sphere of examining the relative effect of multiple representation strategies on learning outcome in social studies with the ultimate aim of helping teachers to discover appropriate instructional methods that will promote meaningful learning during social studies lessons.

### Research Questions

- iii. What is the effect of using multiple representations and conventional teaching strategies on students' learning outcome in social studies?
- iv. What is the effect of gender on learning outcome of students in social studies when taught through multiple representation and conventional means?

### Null Hypotheses

- Ho<sub>1</sub>: There is no significant effect of multiple representation and conventional teaching strategies on students' learning outcome in Social Studies.
- Ho<sub>2</sub>: There is no significant effect of gender on learning outcome of students in social studies when taught through multiple representation and conventional means.

### Methodology

A quantitative research method was employed for data collection in this study. The quantitative approach entails a quasi-experimental research design which involved pre-test, post-test experimental and control groups. The target population for the study for which generalizations were made consisted of students in Lagos State Public Junior Secondary Schools having a total population of 337,724 with 349 Junior Secondary Schools (Lagos State Ministry of Education, 2021). The population covers both male and female students from all the Junior Public Secondary Schools in Lagos State. The sample for the main study comprised of 270 participants whose ages range from 12-17 years of junior secondary school II and were selected from six sampled co-educational schools in Lagos State Education District V. Lagos State is clustered into six Education Districts but Education District V was randomly selected from the six Education District and simple random sampling techniques were adopted to select four schools from Ojo zone in Education District V. The schools were co-educational schools because gender is one of the moderating variables in the study. Intact classes of JSS II in the sampled schools were involved in the study. The instrument used for collecting data was Social Studies Achievement Test (SSAT). The Social Studies Achievement Test (SSAT) was used to find out the students' level of learning social studies concepts. It contains sections A and B. Section A contains items on the Bio data of the students and information on educational background of parents. Section B comprised of twenty-five (25) multiple choice objective test items with four options per item. The questions were adapted from past questions for Junior Secondary Certificate Examination on Social studies (JSCE) 2015-2021. The questions covered the concepts of resources in the first term JSSII of the Social studies syllabus as stipulated in the National Curriculum for Junior Secondary Social studies and Lagos State Ministry of Education modified scheme of work. The validity of the SSAT, being a standardized test, had been established by the Lagos State Examination Board.

The test-retest reliability was performed using 50 students from two public junior secondary schools that were not part of the schools for the main study on two occasions of an interval of two weeks. K-21 were used to determine the reliability of Social Studies Achievement Test (SSAT). The Social Studies Achievement Test (SSAT) was a reliable index of 0.81. The Pre-test was administered to all the groups together. Thereafter, the students were divided into two groups control (conventional) and experimental (multiple representation) groups. Each of the groups received a treatment. The subjects in the experimental group 1 were exposed to the topics, resources in social studies using Multiple Representations Teaching Strategy. The control group was also exposed to the same content using the traditional or conventional method of teaching. However, the scores of all the subjects were taken before and after the treatments. The treatment lasted for four consecutive weeks. The post-test is a comprehensive test on the same

topics that participants had attempted in pre-test irrespective of whether they were in the treatment groups or controlled group. The question items drawn on social studies from junior secondary school (JSS) examination organize by Lagos state ministry of education was administered to them. The participants (students') were tested with the social studies' academic achievement test at the end of the 4-weeks of treatment. The data obtained from the administration of the instrument were analyzed thus: Descriptive analysis: The descriptive statistics used includes arithmetic means and standard deviation for answering the research questions. The second stage was the testing of hypotheses using inferential statistics of t-test the stated hypotheses at 0.05 level of significance.

## Results

### Answer to the Research Questions

**Research Question One:** What is the effect of multiple representations and conventional teaching strategies on students' learning outcome in social studies?

**Tables 1: Mean and SD of pretest and posttest of learning outcome of multiple representation and control groups**

Treatments	N	Pre test		Post test		Difference	
		M	SD	M	SD	M	SD
Multiple Representation Group	131	6.88	3.90	17.76	7.81	10.88	3.90
Control Group	139	6.94	1.73	14.18	6.05	7.24	4.32

The table above revealed that those students who were taught through Multiple Representation Teaching Strategy (M=10.88, SD=3.90), performed academically better than those who are taught through the Control (M=7.24, SD=4.32). The result obtained provides that there is a significant effect of multiple representation on students' learning outcome in Social Studies

**Research Question Two:** What is the effect of gender on learning outcome of students in social studies when taught through multiple representation and conventional means?

**Table 2: Mean and SD of learning outcome of pretest and posttest social studies learning outcome based on gender**

Gender	N	Pretest		Posttest		Difference	
		Mean	SD	M	SD	M	SD
Male	140	7.000	3.286	16.653	7.7586	9.653	4.4726
Female	130	6.730	3.016	16.312	7.1644	9.494	4.1484

The table above showed the mean and standard deviation of the social studies learning outcome of male and female students who are parts of this study; the male (M= 9.65, SD= 4.47) and female students (M= 9.49, SD= 4.15). The result obtained provides that there is no significant gender effect on students learning outcome in social studies when taught through multiple representation teaching strategy.

### Null Hypothesis

**Ho<sub>1</sub>:** The hypothesis states there is no significant difference in the learning outcome of multiple representation and conventional teaching strategies on students' learning outcome in Social Studies.

**Table 3: t-test showing difference between learning outcome of students in social studies when taught through multiple representation and conventional methods**

Groups	Post-test	N	Mean	Std. Deviation	t	p
Multiple Representation Group		131	17.76	7.81		
Control Group		139	14.18	6.05	13.917	.000

Table 3 shows statistically significant difference between learning outcome of multiple representation and conventional teaching strategies on students' learning outcome in Social Studies [ t (142) = 13.917; p<.000]. This

implies that the hypothesis which stated that there is no significant difference in the learning outcome of multiple representation and conventional teaching strategies on students' learning outcome in Social Studies is rejected.

**Ho<sub>2</sub>:** The hypothesis states there is no significant main effect of gender on learning outcome of students in social studies when taught through multiple representation and conventional means.

**Table 4: t-test showing gender difference between the learning outcome of students in social studies when taught through multiple representation and conventional methods**

Groups Post-test	N	Mean	Std. Deviation	t	p
Male	140	16.653	7.7586	13.917	.000
Female	130	16.312	7.1644		

Table 4 shows statistically significant difference between main effect of gender on learning outcome of students in social studies when taught through multiple representation and conventional means. [ $t(283) = 13.917$ ;  $p = .000$ ]. This implies that the hypothesis which stated that there is no significant difference between the main effect of gender on learning outcome of students in social studies when taught through multiple representation and conventional means is rejected.

### Discussion of Findings

The study found out the effect of multiple representation strategy on social studies instruction and students learning outcome in Lagos State junior secondary school. The findings from the study showed that there was statistically significant difference between learning outcome of multiple representation and conventional teaching strategies on students' learning outcome in Social Studies [ $t(142) = 13.917$ ;  $p < .000$ ]. The findings generally revealed that students treated with Multiple Representation Teaching strategy performed academically well than the conventional means. Squeira (2012) stressed that learning through some methods is passive rather than active. What students learn as suggested by Abdu-lhamid (2013), is greatly influenced by how they are taught. Harrison, Andrews, and Saklofske (2003) suggested that students who employ appropriate learning strategies during academic tasks work more effectively than students who do not. The results of this study generally reveal that application of the therapies, that is, Multiple representation strategy enhances effective learning outcome in Social Studies.

The finding is consistent with earlier findings of Van Heuvelen & Etkina (2006) specified that student's performance in similar problems posed in different representations might yield significant different results. This aligned with the result of the findings in this study which corroborate the views of Kohl & Finkelstein (2004) that students in social studies classrooms normally show satisfaction in visual or concrete representations, while others showcased symbolic or abstract representations. Actually, students with high problem-solving capabilities usually demonstrate enormous skills in solving immediate problem through manipulating their language translation and representations (vocal), picture representation (picture, graphic) and formal representation (sentence, phrase, rule and formula). In line with the opinion of Abimbola & Danmole (1995) asserted that to reduce the difficulty students 'face in learning concepts, teachers must analyze concepts meant for learning and specify their level of complexity, abstractness and sophistication. It is therefore suggesting that for maximum effectiveness, intervention should include training and re-training of Social Studies teachers in the area of teaching strategies and methods capable of enhancing active participation and improved learning outcome.

The result in table four shows that the application of the therapy, that is, Multiple representation teaching strategy had no significant effect on the basis of gender (male and female). [ $t(283) = 13.917$ ;  $p = .000$ ] Some researchers have reported the prevalence of significant gender differences in performance of students in Social Studies, some in favour of males, some in favour of females while some found no difference (Okonkwo, 2012; Ahmed & Munawa, 2013; Ogonnaya, Okafor, Abonyi & Ugama, 2016). Some of these were attributed to factors which include the teaching strategies adopted, religious beliefs, economic, cultural and social belief, etc. Gender has remained an issue in relation to both enrolment and achievement amongst social studies students' in junior secondary school (OECD, 2005; Mbamara & Eya, 2015; Banjong, 2016; Oliver et al, 2017). Girls are said to think and learn differently as well as to interact with equipment differently from boys (Valentine, 1998). This implies that teaching methods and strategies could be gender biased. Research efforts are therefore geared towards determining instructional strategies that could give equal appeal to both the male and female learners. There is paucity of research-based information and lack of agreement on how gender influences or combines with multiple

representation strategy to determine achievement in social studies (Appoji & Shailaja, 2017; Cheema & Mirza, 2013; Ahlberg & Ahoranta, 2004).

Some other studies (e.g Pearsall, Skipper and Mintzes, 1997) show that female university students produce more complex representation than their male counterparts. This was true for the university students in Martin, Mintzes & Clavijo (2000) when the structural complexity and propositional validity of representation were evaluated using a modified version of Novak & Gowin's scoring method. The reasons for such contradictory findings are not evident and clearly warrant further investigation. It is therefore expedient to examine the moderating effect of gender and or its interaction with multiple representation instructional strategy on the achievement of students in social studies and this formed the inclusion of gender as variable in this study. Bello & Abimbola, (1997) believes that multiple representation ability is not significantly influenced by students' gender. Bilesanmi-Awoderu (2002) similarly observed no significant main effect of gender on the experimental treatments. Candan (2016) also found out that there was not statistically significant difference between students' academic performance based on gender when a particular method of teaching is applied in the classroom. Explaining further, Ikwumelu & Oyibe (2014) observed that there is no significant difference in the mean achievement of male and female students when self-directed learning strategy is used. Multiple representations can serve as one of the self-directed learning strategies. Notwithstanding the fact that some of the previous studies revealed an effectiveness of multiple representation on students' achievement during instruction, one or two others indicated a non-significant effect of multiple representation (Ajaja, 2011).

Such differing results may not undermine the effectiveness of multiple representations especially when the results are critically considered. The need for this current study stems from the reduced achievement of Social Studies objectives and inability of learners to transfer knowledge and skills acquired in Social Studies. Poor teaching method used, may have contributed to this bottle neck (Adeyemi, 2008). Students are only exposed to rote learning which does not make room for retention and knowledge application. There is need to introduce a child centered method of teaching so as to produce a meaningful learning. This is to say that the instructional methodology should be revisited in order to improve students' performance and enhance learners' ability to solve the abounding societal problems.

### Conclusion

The main goal of this study generally is to show the effectiveness of Multiple Representation teaching strategy on students' learning outcome in social studies and domain of interest is Lagos State Junior Secondary Schools. This study equally seeks to find the moderating effect of the treatment; that is, Multiple Representation teaching strategy on the basis of gender (male/female). It was affirmed that students exposed to both multiple representation and concept mapping teaching strategies had improved positive performance in Social Studies. Thus, this study has shown that the treatments (multiple representation) to be relevant and efficacious in enhancing students' learning outcome.

### Recommendations

In view of this, the following recommendations are made:

1. Social Studies teachers should be trained to always adopt students centered approaches in the classroom.
2. The government should subsidize textual materials and teachers should be adequately equipped with necessary and relevant materials appropriate to achieve instructional objectives.
3. The study showcased the strength of the Multiple representation teaching strategy, it will therefore be recommended that Social Studies teachers be given training and re-training in the area of teaching strategies and methods capable of enhancing active participation and improved learning outcome.

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