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Effects of Guided Inquiry Method on Secondary School Students' Performance in Social Studies Curriculum in Anambra State, Nigeria

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Authors' contributions

Both authors conceptualized the study. Author OEI designed the study, organized the literature, performed the statistical analysis and managed the analyses of the study. Author EKO wrote the outline and conducted the literature searches. Both authors wrote the first draft, read and approved the final manuscript.

Research Article

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ABSTRACT

Aims: To examine the effects of the Guided Inquiry Method [GIM] on students' performance in Social Studies in Anambra State relative to gender.

Study Design: The study used quasi experimental design.

Place and Duration of Study: Junior secondary schools in Anambra State of Nigeria, between September 2012 and November 2012.

Methodology: Sample comprised 163 students [81 males, 82 females] in four randomly drawn secondary schools. A 30-item Social Studies Achievement Test and Classroom Observation Rubric were used to collect pre-test and post-test data. Arithmetic mean, standard deviation, mean gain scores and qualitative analysis were used to answer research questions while t-test and the analysis of co-variance were used to test hypotheses.

Results: The achievement scores of students taught with Guided Inquiry method [N=82] in the pretest [\bar{X} 40.56] increased in the posttest [\bar{X} 56.90] indicating a mean gain of

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[\bar{X} 16.34]. Students in the control group taught with Traditional Lecture Method [N= 81] obtained a mean gain [\bar{X} 4.37] between pretest [\bar{X} 40.28] and posttest [\bar{X} 44.65] in Social Studies. This indicates that students taught with Guided Inquiry Method performed significantly better and participated more in Social Studies lessons than those taught with the Traditional Lecture Method. There was no significant difference [P 0.05] between the mean scores of male and female students taught Social Studies with the Guided Inquiry method.

Conclusion: Guided Inquiry Method significantly improved students' achievement and participation in Social Studies lessons more than the Traditional Lecture Method.

Keywords: Guided inquiry; students' achievement; class participation; experiential learning; gender.

1. INTRODUCTION

Curriculum is the vehicle for facilitating education. It is the planned and guided learning experiences and intended learning outcomes, formulated and provided under the auspices of the school, for the learner's continuous and wilful growth in cognitive, affective and psychomotor competence. It is programme of studies and activities designed so that learners will attain as far as possible, certain educational goals and objectives. Curriculum thus involves all the actions of the school, which are aimed at getting the child to begin a course and at the end attain educational goals [1]. According to [2], it comprises of the courses or subjects and their contents to be studied by learners at all levels of education. Among such subjects are Social Studies.

In Nigeria, there is a major concern about students' performance in Social Studies as manifested in their tests and examinations grades. In this study, performance is defined according to how well a student performs in tests, examinations and participates in lessons. [3] observed that in recent years, Nigerian secondary school students' achievement in Social Studies on average has remained flat or has declined. This resonates with [4] and [5] that students have continued to achieve poorly in Social Studies Examinations. Students' poor achievement in junior secondary school Social Studies also affects their interest and achievements in related courses like Geography, Law, Sociology and above all, makes them unable to apply desirable social and citizenship skills to their daily challenges of living.

Another issue of concern is the question of gender stereotypes in Social Studies. A study on the teaching and learning of Social Studies in secondary schools in Nigeria by [4] lamented the prevalence of gender stereotype in Social Studies. This has become a source of worry, as it is difficult in the present day society to address the issue of national development without recourse to gender factor [6]. Thus, male and female students ought to participate equally in Social Studies education, which is a vital tool in the development of nation.

One of the leading causes of students' poor performance in Social Studies in Nigeria as reported by [4], [5] and [7] has to do with the instructional methods used by teachers, which are inadequate to bring about desired level of achievement and classroom participation in both male and female students. Some of the methods used by teacher are expository and makes students to become very passive. [3,8,9] also found that many Nigerian Social Studies teachers mostly used the Traditional Lecture Method that centers on the teacher, text book, the chalk and the chalkboard. Under this scene, the teacher is seen as a

disseminator of knowledge, the knower of the answer and a lecturer who heavily relies on textbooks as the only available instructional material; conveys facts and procedures to students and hardly encourages students to engage in practical and creative learning activities. The Traditional Lecture Method of teaching has been largely criticized for stifling interest and creativity in students thereby limiting academic achievement [10,11,12,13,]. There is therefore a need to use innovative teaching methods to see if there will be improvements in students' achievement in Social Studies.

To improve performance in Social Studies, several investigators including [3,7] and [8] have catalogued the instructional strategies recommended in the National Junior Secondary Schools Social Studies curriculum implementation guidelines. One of such methods is the guided inquiry method. Guided inquiry is an aspect of transformational teaching which has been spurred by the development of several learning principles and methods of instruction, including active learning, student-centered learning, collaborative learning, experiential learning, and problem-based learning [14]. It is a student-centered method of teaching whereby students interact actively, question assumptions and provide their viewpoints on any area of subject matter. As described by [15], in this approach to instruction, the teacher facilitates and prompts students to conduct investigations and construct their own meaning of the events and phenomena that occur naturally. It is through such investigations at the students' own rates and levels of ability that learning takes place. Guided Inquiry also emphasizes higher-level thinking skills and collecting, analyzing and synthesizing information and data from multiple sources and viewpoints [16]. A teacher using this method presents concrete experiences of authentic problems and the research materials that students would examine in order to reach a conclusion about the problem. The teacher also asks lots of questions and uses speculative statements with many speculative interactions designed to raise issues for students' discussion. Students are allowed to probe public issues based on instructional content. This method involves the use of classroom discussions, projects, pre-learning, student-generated activities, collaborative learning, problem-solving, role-plays and question prompts. [17] noted that through guided inquiry method of instruction, teachers facilitate students' movement from the stage of collecting data to a higher cognitive level of thinking as they interpret data and make sense of discoveries. Thus guided inquiry address calls for authentic inquiry [3,10], which aligns well with social studies pedagogy.

Many researchers have found positive results when using inquiry-based instruction as opposed to traditional instruction in sciences and languages [10,16,18,19,20,21,22]. Others did not find significant effects [23,24]. However it appears that studies conducted on the effects of this method on students' achievement in social studies are few and have not provided consistent and conclusively positive results [3,8,15]. Making matters even more complicated is that research that examines the effectiveness of guided inquiry for improving students' achievement relative to gender have also produced inconsistent results. Some studies are found that males perform better than females [25,26,27]. On the other hand, some studies indicated that there are some differences in using guided inquiry in online learning between male and female students [28,29], while others did not [3, 30]. In the light of inconclusive results for gender effects with regard to student success in guided inquiry, the present study has included gender as a moderating variable that could affect students' achievement in Guided Inquiry. It is against this background that the purpose of this study is to compare the effects of the use of Guided Inquiry Method [GIM] and Traditional Lecture Method [TLM] on students' performance in Social Studies.

1.1 Theoretical Framework

The theoretical framework for the guided inquiry method used in this study derives mainly from the Kolb's experiential learning theory [ELT]. Experiential learning theory [ELT] defines learning as "the process whereby knowledge is created through the transformation of experience and knowledge results from the combination of grasping and transforming experience" [31]. The ELT theory comprises four-stage learning cycle with two dialectically related modes of grasping experience, Concrete Experience [CE] and Abstract Conceptualization [AC] and two dialectically related modes of transforming experience – Reflective Observation [RO] and Active Experimentation [AE]. According to the four-stage learning cycle, immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences. Thus, ELT is posited mainly on the belief that the effective learning involves the learner moving from controlled practice, through guided work to mastery of knowledge structures in an enabling environment [32].

Using guided inquiry, concrete experiences could be provided by engaging students in hands-on, real world observation and inquiry in their local environment. Hands-on involvement refers to the amount of experiential exposure students have to the content they are exploring in direct contact. Real objects and field experiences contribute opportunities for students to have hands-on involvement [13]. In social studies, this would involve visit to museums or cultural places, watching media debates on social affairs, role-playing, debates, case studies, and reading media to obtain information. These activities would help to ground learning in local phenomena and students' lived experience.

Upon offering a variety of experiences which stimulate self activity on the part of the learner, abstract conceptualization occurs when students become curious or challenged as they try to make meaning out of the experiences. Such abstract conceptualizations occasioned by lower levels of teacher involvement and higher levels of student hands-on involvement and responsibility for learning might propel students to ask the teacher more questions. To overcome abstraction, the Guided Inquiry environments may include direct instruction provided on a just-in-time basis once students indicate a need to know the information presented [26]. Thus a mini-traditional or over-view lesson presenting key information from teacher to students is used when students understand the necessity of that information and its relevance to their problem-solving and investigational practices. Such just-in-time direct instruction promotes knowledge construction in way that makes knowledge available for future use in relevant contexts.

Student responsibility for learning can be seen as linked to their personal reflections and how much teacher guidance is given during instruction. Students deciding how to tackle the problems, forming their own questions for study, designing their own studies and determining how to present data and conclusions – and being responsible for seeking assistance when it is needed – characterize reflective observation and active experimentation in which students have more responsibility for learning [33, 34, 35]. It is within this milieu that learning becomes meaningful, integrative, value-based, challenging and exciting.

1.2 Research Questions

Three research questions have been stated to guide the study. They are as follows:

1. What are the mean achievement gains of students taught Social Studies with the Guided Inquiry Method [GIM] and those taught with Traditional Lecture Method?
2. What are the mean achievement gains of male and female students exposed to Social Studies with the Guided Inquiry Method [GIM] and those taught with Traditional Lecture Method?
3. To what extent does GIM encourage students' participation in lessons more than TLM?

1.3 Null Hypotheses

The under listed null hypotheses, tested at the 0.05 level of significance, have been formulated for the study.

HO1 There is no significant difference between the mean achievement gain scores of students taught Social Studies with Guided Inquiry Method [GIM] and those taught with the Traditional Lecture Method [TLM].

HO2 There is no significant difference between the mean achievement gain scores of male and female students taught Social Studies with Guided Inquiry Method [GIM] and those taught with the Traditional Lecture Method [TLM].

2. METHODOLOGY

2.1 Research Design

The study is a quasi-experimental design. Specifically, the pre-test-post-test quasi experimental design was used. It involved two groups of students [experimental and Control], and two dependent variables [achievement and interactions]. One of the groups was the experimental group taught the Social Studies topics using the Guided Inquiry Method [GIM] while the other was the control group that was taught using the Traditional Lecture Method. A pre-test was administered on the two groups before the experiments. At the end of the experiments, a post-test was also administered on the groups after reshuffling the items to ascertain Achievement gains.

2.2 Sample and Sampling Technique

Sample involved 163 JSS III Social Studies students [80 boys and 83 girls] selected through stratified random sampling technique from public secondary schools in Anambra State of Nigeria for the 2011/2012 academic year. Stratification was based on the gender of the schools [i.e Boys Schools and Girls Schools]. 2 boys and 2 girls' schools were selected. Then, in each of the selected schools, one intact JSS class was selected totaling 4 intact classes of 163 JSS III students. The classes were further randomly assigned to experimental and control classes.

2.3 Instrumentation

A Social Studies Achievement Test [SSAT] was used in this work. The test consisted of 30-item objective questions that were adopted from Basic Social Studies Tests for Junior Secondary Schools III and modified by the researcher for this study. The modification involved restructuring and aligning the content to reflect the concepts outlined in the scope of the study. This test was used, as a pre-test to determine the comparability of the groups and determine the extent of Social Studies knowledge already possessed by subjects before the study. The same test was used at the end of the experiment as a post-test for the purpose of measuring the achievement gains of the students as a result of the treatments. The marks obtainable for each of the objective questions was 2 marks [total 60 marks] while each of the essay questions carried 10 marks [total 20 marks].

A Classroom Observation Rubric [COR] was also used by researchers to record the significant processes in students' and teachers' activities during the lessons. The rubric required researchers to note at the end of every classroom visit, the most prevalent features of students' interaction and teachers' interventions as they engaged in the process of guided inquiry. The COR contained three rows and eighty-three columns as well as an open ended space for writing sketchy notes on observed teachers' activities. The rows focused on the number of turns taken by each participant, the competition for turns and students' engagement in tasks, while the columns were used to record the observations made for each student. For each observation in number of turns taken, the researchers put an X for the student in question. For instance, if student number 2 took 3 turns within a particular lesson, the researchers entered XXX for the student. The total number of X was computed to show the actual number of turns taken per student at the end of the experiment. The rows for competition for turns and students' engagement in tasks had a rating scale of 12 per criterion (range=1 to 12). For each observation, the researchers circled the score they deemed most appropriate based on the students' activities. The evaluation guide used for the interpreting the coding was as follows: Scores 1-3 =Poor; 4 - 6 = Average; 7-9 Very Good, while 10-12 =Excellent.

The SSAT, COR and lesson units were presented to two experts in Social Studies and one expert in measurement and evaluation for face validation. Along with these instruments, the research purpose, scope, research questions, hypotheses, and the Social Studies syllabus were also submitted to these experts. The experts reviewed the items in terms of language use, appropriateness of concepts, and to ascertain if the test would be covered within the time specified on it. Corrections were made on the final draft of the questionnaire based on the reviewers' suggestions.

To reliability of the items in the SSAT was determined using Cronbach Alpha scale analysis in order to determine the homogeneity of items with content clusters as contained in the content of test blue print. Coefficient values obtained for the three content areas were as follows: 0.66 for items in the origin and nature of man, 0.71 for items on social environment, and 0.68 for items on socialisation and social instability

2.4 Extraneous Variables and Their Control

A major strength of the non-equivalent control group design is its ability to control such sources of internal invalidity such as history, maturation, testing, instrumentation and selection. However there were attempts to control other extraneous variables that could

have threatened the study. Such variables include non-randomization effect, novelty effect and experimenter bias.

2.4.1 Non-randomization effect

In view of the fact that it was not be feasible to select subjects at random, efforts were made to ensure similarity among students in terms of gender, school background, and teaching method. In this regard, each of the two teaching methods was used in one boys' and one girls' class. All the classes were chosen from public schools to ensure similarity in school background. To make the classes compatible in terms of academic achievement, intact classes were used and the schools chosen were at the same level of coverage of their scheme of work.

2.4.2 Novelty effect

To avert novelty effect, regular social studies teachers in the participating classes taught the students after being trained on the instructional techniques by the researchers. The teachers used prompts and reflective questions to guide students whenever the students in the GIM group appeared to be overwhelmed by the new instructional techniques.

2.4.3 Experimenter bias

To reduce the problem of experimenter bias, the researchers developed two different lessons plans to be used as they relate to each of experimental and control groups. The same lesson units and content were presented to the two groups. The researchers also visited the classes at random to observe if the teaching processes were as stipulated in the lesson units. Moreover, both the pre-test and post-test were marked according to the same marking scheme worked out by the researchers.

2.5 Experimental Procedure

Two weeks before the commencement of the actual quasi-experiment, 4 intact classes of one hundred and sixty-three JSS III Social Studies students were randomly assigned into two groups of two classes each. One of the groups [N=82] was randomly assigned to be taught Social Studies with GIM. The other group [N=81] was taught Social Studies through the Traditional Lecture Method. The GIM group was the experimental group while the EM group was the control group. Students in both the experimental and control groups were then given a pre-test two weeks prior to the initiation of Guided Inquiry Method [GIM] and Traditional Lecture Method [TLM]. Here, the test scores were used to determine the existing levels of Social Studies knowledge among students prior to the commencement of the experiments.

Four regular Social Studies major who were teachers participated as research assistants in the study. The teacher-participants were informed and trained for this study at the beginning of their second term. The training was carried out on a Monday and lasted for two hours. It involved a description of the study's scope and intent, as well as a brief overview of what teachers should do, how they should do it and the curriculum that would be covered. The teachers were then assigned to each of the four classes to teach students using GIM and TLM.

For those to teach the GIM group, the researchers further trained them for another two hours on a Tuesday. Training covered explanations of what Guided Inquiry Involved, descriptions of the lesson plans, and demonstrations on how to use the guided inquiry activities in the lesson plans in classes. The essence of the COR was also discussed. After the training, the teachers practiced GIM for 2 lessons of 40-minutes each. The researchers noted and reinforced the teachers' expertise and correct GIM usage.

The actual quasi-experiment was designed to last for seven weeks using the normal 40 minutes per period allocations for Social Studies in the participating schools. Two different sets of lesson plans on Social Studies were prepared to be administered on the experimental and control groups over a period of seven weeks. The content of the lesson plans were drawn based on the JSS III scheme of work for 2nd term. These lesson plans emphasised the GIM and TLM methods of instructions as relevant to the treatment for the experimental and control groups respectively.

The lesson plans utilized in the GIM groups were designed to take place both inside and outside the classroom with an experiential focus. Inside the classroom, the teachers carefully planned and delivered lessons with a variety of explanations, demonstrations and community resources. Guided notes were given that contained the terms and concepts which students would need mastery of to complete their tasks. Students used these notes to guide them in completing projects inside and out-side of the classroom. After the direct instruction, the teachers assigned students to observe concrete experiences and examples of the civic life of their communities, examine local culture, and include social environmental problems.

For instance, in a lesson on the origin and nature of man, teachers took students outside the class to sit under a tree. They asked students to observe the environment and write the things they could see [concrete field experiences]. They also asked students to write down the differences between the things in the environment and man [abstraction, reflection experimentation]. They pointed at students at random to use the observed differences to describe the nature and characteristics of man [reflection and experimentation]. The lessons were rounded off by teacher summary. For the next lesson, some social activities were introduced to encourage participants to familiarize themselves with the origin and nature of man. Students were required to ask their parents where and how people from their family came to be. They also read their Social studies textbook and the Bible to get more information. When they came for the next lesson, with guided questions from the teachers, they were able to use the three sources of information [parents, textbook and bible] to write major points on the origin and nature of man. As the students worked mostly in teams, each student team was required to note and present to the class, short piece of critically reflective writing on an aspect of their own points. A referencing quiz and some discussion scenarios were also facilitated by the teachers to further provoke inquiry. The teachers used students' answers to the quiz and discussions to build a chalkboard summary of the origin and nature of man. They teachers finally gave them guided notes which were marked at the next class. These activities are in line with the underlying premise for reflection and experimentation in guided inquiry method in that knowledge is discovered and constructed by students and transformed into concepts to which students can relate [13,26,30].

In order to arrive at an estimation of agents of socialization and social stability, students were asked to read newspapers and write reports on actions depicting social instability. Students also spent time outside the classroom in churches, families, markets, forest edge gathering data and utilized this data in their project. They then role-played a youth group

meeting where they simulated problems of youth violence which led to social instability. These activities presented with concrete experiences. Some of the central questions students needed to answer were “What do people learn from their families/church/school/community?” Describe the responsibilities people have to their families/church/school/community?” Justify how youth groups contribute to community development? In what ways can group functioning affect social stability? As they tried to answer these questions, the students engaged in abstractions and hypotheses testing [30]. By way of reflection, the students were required to justify their recommendation in a report that detailed the various agents of socialization and how these agents contribute to social interactions among people in a community. Having the students examine a researchable problem that affects their community using data, met the criteria for inquiry.

The Traditional Lecture Method applied involved teachers’ presentation of content in a logical sequence through a lesson unit format while the students listened and took down notes. The teachers introduced the lessons, gave definitions of concepts, made explanations, clarified ideas and asked students questions on relevant topics. As the teachers taught, they built a chalkboard summary of the lesson. They also paused from time to time to answer students’ questions. Then they wrote notes for students to copy.

In the experimental and control groups, the Social Studies text book and workbook assignment were used as instructional materials. At the end of each lesson, the students were given assignments as indicated in the lesson notes. As the lessons went on in both the experimental and control groups, the researchers conducted ongoing classroom observations twice in a week to confirm that each teacher taught the curriculum model actually meant for each group to use and observe classroom interactions.

2.6 Administration of Tests

Two weeks prior to the experiments, the subjects in all the groups were given a pre-test. The scores on the tests were used to determine the extent of knowledge of Social Studies already possessed by subjects before the study. It also served as a comparison to the post-test to determine if any achievement gains occurred after the experiments. The research assistants [regular Social Studies teachers] administered the test to the groups during the continuous assessment periods. At the end of the seven weeks, the tests were repeated following the same procedures as in the pre-test. The essence of this post-test was to determine the academic achievement gains of the students as a result of participating in the experiments. The pre and post tests were duly marked and scored.

2.7 Method of Data Analysis

Mean, standard deviation and gain scores were used in analyzing the data for the research questions. Gain scores were calculated by subtracting the summated pre-test scores from the summated post-test scores. For the test scores only mean scores of 60% and above were regarded as a high level of achievement. The mean scores obtained from the achievement Tests [pre-and post-tests] were subjected to Analysis of Covariance [ANCOVA] at the 0.05 significance level. ANCOVA was used to test the two hypotheses. The ANCOVA serves to adjust the post-test scores for pre-test differences.

3. RESULTS AND DISCUSSION

Analysis in Table 1 reveals that the mean of the control group [Traditional Lecture Method] on the pretest was 40.28 while that of the Experimental Group [Guided Inquiry] was 40.56. This indicates that there were variations between the pre-test mean scores of students taught Social studies with the Guided Inquiry method and those taught with the Traditional Lecture Method. The mean pre-test score of the Guided Inquiry group was less than that of the Traditional Lecture Method group.

However, in the post test, the control group [Traditional Lecture Method] and the experimental group [Guided Inquiry] got mean scores of 44.65 and 56.90 respectively. The control group obtained a mean gain score of 4.37 while the Experimental Group [Guided Inquiry] got a mean gain score of 16.34. Therefore, the mean academic achievement gain of students taught Social Studies with the Guided Inquiry method was higher than that of those taught with the Traditional Lecture Method.

Table 1. Means, standard deviations and gain in achievement of experimental and control groups

Treatment Groups	N	Pre-test		Post test		Gain [treatment Effects]
		\bar{X}	SD	\bar{X}	SD	\bar{X}
Control Group [Traditional Lecture Method]	81	40.28	16.25	44.65	16.04	4.37
Experimental Group [Guided Inquiry]	82	40.56	16.08	56.90	12.73	16.34

Analysis in Table 2 shows that students taught with the Guided Inquiry Method performed significantly better than those taught with the Traditional Lecture Method on the Same Social Studies Achievement test. The analysis reveals that all the F-calculated values are significant. Specifically, with 1 and 160 degrees of freedom [$p < 0.05$], the calculated F value for the main effect is 8886.31. This value is greater than the F-critical value of 3.84. This led to the rejection of the null hypothesis. The decision is that there was a significant difference between the mean achievement gains of students taught Social Studies with Guided Inquiry Method [GIM] and those taught with the Traditional Lecture Method [TLM].

Table 2. Analysis of covariance for the pre test and post test scores of experimental and control groups [P.05]

Source of Variation	Sum of Squares	Degree of freedom	Mean Square	F- Cal	F-Crit [$p < 0.05$]
Corrected Model	1472.77	1	1472.77	45.45	3.84
Intercept	287940.82	1	287940.82	8886.31	3.84
TreaTLMent	1472.77	1	1472.72	45.45	3.84
Error	5216.84	161	32.40		
Total	294894.00	163			
Corrected Total	6689.61	162			

In Table 3, there were also some variations in mean achievement gains of male and female students taught Social Studies with the Guided Inquiry Method [GIM] and those taught with

Traditional Lecture Method. The table shows that the pre test means of male students in the control group [Traditional Lecture Method] was 37.89 while that of male students in the Experimental Group [Guided Inquiry] was 37.34. In the post test, male students in the control group [Traditional Lecture Method] got mean scores of 42.05 indicating a mean gain of 4.96. The post test mean score for male students in the experimental group [Guided Inquiry] was 54.63 with a mean gain of 17.29.

For female students in the control group, their mean pretest score was 43.02, their post test score was 47.79 while their mean gain score was 4.70. Their counterparts in the Experimental Group [Guided Inquiry] had a pre test mean score of 43.24, a post test mean score of 58.44 and a mean gain score of 15.2. These analyses indicate that male and female students in the experimental group [Guided Inquiry] gained higher mean scores in Social Studies than those taught with the Traditional Lecture Method.

Table 3. Means scores and gain in achievement among of male and female students in experimental and control groups

Treatment Groups	N	Pre-test		Post test		Gain [treatment Effects]
		\bar{X}	SD	\bar{X}	SD	\bar{X}
Males Control Group [EM]	39	37.89	15.90	42.05	15.21	4.96
Experimental Group [GIM]	41	37.34	13.93	54.63	11.68	17.29
Females Control Group [EM]	42	43.02	16.66	47.79	16.80	4.70
Experimental Group [GIM]	41	43.24	17.40	58.44	13.84	15.2

A t-test analysis was performed to determine if the differences in the mean scores of male and female students taught with the Guided Inquiry. Data presented in Table 4 shows that the t-calculated values between male and female students in the Guided Inquiry group were 1.34 in the pre-test and 1.69 in the post test. These values were less than the t-critical value of 1.96 at 80 degree of freedom [$p < 0.05$]. The decision is therefore to accept the null hypotheses and uphold that there was no significant difference between the mean scores of male and female students taught Social Studies with the Guided Inquiry method.

Table 4. Independent samples test for pre-test and post test mean scores of male and female students in the Guided Inquiry group

	Gender	N	Mean	Std. Deviation	Df	t-cal	t-crit [$p < 0.05$]	p value
Pretest	males	41	37.34	13.9277	80	1.34	1.96	0.039
	females	41	43.24	17.3980				
Post test	males	41	54.63	11.6807	80	1.69	1.96	0.047
	females	41	58.43	13.8384				

3.1 Discussion of Results

The findings of the study revealed that the mean achievement gain of students that were taught Social Studies with guided inquiry method [GIM] was higher than that of those students taught with the Traditional Lecture Method. It was observed that students in both the experimental and control groups were at a similar level of academic achievement in

Social Studies before the commencement of the study as measured by their scores on the pre-test. However, after the experiment, the GIM group obtained the highest post-test mean gain score. This proves that students in the experimental group had improved their scores after participating in Guided Inquiry Method that the TLM group. These results indicate that both traditional and Guided Inquiry Methods led students to high social studies achievement, but in line with studies by [3] and [26,27], achievement was higher for students taught with Guided Inquiry.

The test of null hypothesis one showed a significant mean difference in Social Studies Test between GIM and TLM groups. This led to the rejection of the null hypothesis. It was upheld that there was a significant difference in academic achievement between students taught Social Studies with GIM and those taught with the Traditional Lecture Method. This significant difference was in favour of the GIM group who had higher post test mean scores than the TLM group. Thus, GIM enhanced students' achievement in Social Studies Test more than TLM. This finding gave empirical support to earlier findings in this area [19, 30] which found that GIM was very effective in teaching academic concepts and increasing students' academic gains over and above the Traditional Lecture Method.

The results indicated that whereas the pre-test mean scores of the male and female students in the experimental and control groups were similar, their post test means differed. Moreover, the mean academic gains of male and female students in the experimental group were above those of male and female students in the control group. However, data for this study indicated that while male students in both the experimental and control groups had more academic gains than female students in both groups. This finding suggests that male students in both groups performed better than the female students. On the other hand, the finding disagrees with that of [34] who found that male and female students in Nigeria taught chemistry with inquiry method did not perform better than those taught with the expository lecture-demonstration method. This disagreement could be because the present study was on Social Studies, while [34]'s study was on Chemistry. Besides, in their study, [34] separated the inquiry method and the project method as two different teaching methods. However, the present study included projects as part of the guided inquiry activities.

This finding is also contrary to [26,27] whom found that gender discriminated in favour of males in Guided Inquiry. Those authors explained that their finding was because boys are typically guided towards scientific/technological knowledge rather than in Social studies which is not a science subject. The present finding could be because the emphasis on equal educational opportunities has began to yield positive results as boys are now actively tackling challenges that were hitherto the reserves of girls. And yet another reason would be because the current sensitization campaigns against dwindling male enrolments in schools had stirred up interest in studies among boys in Anambra State. Perhaps, male students have recognized as [3] advocated the potentiality of Social Studies as a subject for effective citizenship and thus, worked harder on the subject just as their female counterparts did.

However, it was observed that the differences in the mean achievement scores of male and female students exposed to GIM were not significant. The null hypothesis was therefore accepted. Although achievement slightly improved more for male students exposed than for female students, such improvement was not significant. In essence, the achievement gain might not have been caused by the gender of students. Rather, the differences were likely to be due to treatment because achievement significantly improved for both gender after the experiment. This finding is in parallel to some previous research results [3,30] who found no

significant gender effects on the achievement of students that participated in inquiry-based instruction.

The findings of the study directly derived from the experiential learning theoretical framework. In line with the experiential learning theory, the researchers introduced concrete experiences that exposed students to hands-on, real world observation and inquiry in their local environment [19] and tried hard to avoid gender stereotyping in the guided inquiry activities. Both male and female students were given the same opportunity and materials to engage in concrete experience, participate actively in the process of knowledge inquiry, experimentation, reflection and acquisition. Although both participating teachers were females, they were highly instructed to avoid gender-stereotypes. Besides, care was taken to ensure that the lesson notes were gender friendly. Both male and female students were fully involved in the teaching/learning activities so their achievement gains were not a matter of chance but as a result of the treatment given to them. Researchers worldwide struggle with how to change traditional instructional approaches to ensure gender equity and strive to educate a wider range of male and female students [6,21]. Hence, the present researchers suggest GIM as a possible solution for gender equity in secondary schools, especially in social studies classrooms. Based on the present findings, educators should be confident utilizing GIM in secondary social studies education.

Analysis of data from Classroom Observation Rubric [COR] indicated that Guided Inquiry encouraged participation among students more than Traditional Lecture Method. Three particular areas of participation among groups in terms of the collaboration and number of turns taken by each participant, the competition for turns and students' engagement in tasks were noted.

At the first visit, students in the GIM group were unsure of what to do and had trouble working with each other. This is in line with Kolb's (1984) abstract conceptualization. The teachers then adjusted their approach by providing questions to stimulate students' thoughts and actions. By so doing, the teachers channeled the students activities towards Kolb's modes of transforming experience so that by the time of the researchers' second visit (day five of the experiment), students were working in full collaboration with each other. This supports [32] that experiential learning facilitates collaboration among students. It was observed that individual participants in the Guided Inquiry group took different number of turns in class activities. However, while working in teams, the team leaders tend to dominate the activities. Other members of the teams were given few opportunities to contribute. When such happened, some students looked unmotivated and bored in their groups. However, when teacher quizzes were introduced, it appeared to limit team leaders' monopoly and give other students more opportunities to contribute ideas to the discussion just as [33] observed.

Competition for turn was observed to be higher for the Guided Inquiry group than the Traditional Lecture Method group. Interestingly, this competition was not for the Guided Inquiry students to give discussions and profound guidelines to guide their reflections. The competition was to get more correct answers to the reflective quizzes. For the traditional lecture method group, competition was minimal and the teacher had to call on participants to make contributions. Besides maybe because the Guided Inquiry group had varieties of questions to answer and resources to guide them, they engaged in fierce competitions to make sure that they exhausted every facility and become the "team giant". At some stages, students appeared to lack self-discipline while doing their tasks. In most cases, the teachers appeared to be unaware of their responsibilities and called on only the team leaders to present group findings, thus turn taking became controlled. The COR also showed that in

line with [23,24], teachers appeared to experience problems with time management, controlling students' indiscipline, and unexpected emergency situations arising from students' competition in group work in guided inquiry. This implies the need for training of teachers on the effective strategies for the use of GIM within the time available for instruction.

Students in the Guided Inquiry Group were more engaged in tasks and activities than the students taught with the Traditional Lecture Method. They followed the guided notes, reviewed and studied them carefully, did their assignments timely and evaluated them by themselves. Within these activities, they engaged in Kolb's (1984) Reflective Observation [RO] and Active Experimentation [AE]. Within the stage of abstract conceptualizations, they frequently asked the teachers questions when faced with problems, and they attended their group discussions during the experiment. Most of the students within each team engaged in little brainstorming to find answers. Mostly the students made suggestions for answers, or rejected answers and offered counter-suggestions, with few examples and explanations for those suggestions or rejections. Each of them strived to get a chance to try out their ideas or suggest to the person responding to try a possibility until someone comes up with the correct answer. Most of them were eager to interact with their peers and teachers. This finding thus corroborates that of [32] that once students are engaged in experiential learning, their levels of peer interactions in class tasks improve. On the other hand, some students taught with Traditional Lecture Method did not attend the classes regularly and they did not prepare assignments to pass on teachers' demand. Similar studies have found that increased engagement occur when inquiry teaching methods are used compared to when traditional lecturing is employed [18,20,22]. One can argue that the total involvement of students in GIM might have made it possible for them to understand the lessons better than the students taught with the Traditional Lecture Method.

4. CONCLUSION

This study reveals that Guided Inquiry Method had a significant positive effect on students' performance in Social Studies more than the Traditional Lecture Method. Specifically, GIM enhanced students' ability to achieve higher scores in Social Studies Achievement Test and participate actively in Social Studies lessons more than TLM. GIM students outperformed peers who learned from a traditional curriculum in social studies lessons. In addition, gender was not a significant factor in the students' mean achievement in Social Studies, under the guided inquiry method. This implies that opportunities for functional learning for both male and female students could be provided through the use of a variety of stimulating instructional strategies such as GIM. This would enable students to learn basic Social Studies skills and gain confidence in their ability to reliably gather and interpret facts as they learn from their own inquiry. New activity-based instructional strategies such as GIM should be adopted in secondary schools especially in teaching Social Studies to Junior Secondary School students. The teacher-training programmes in Nigeria should include Guided Inquiry Method in order to equip would be Social Studies teachers with the techniques and processes involved in the strategies. The teachers need to be trained on how to manage time, class participation, interactions and turn taking in guided inquiry environments. The teachers must always expose male and female students of every ability levels, to a variety of guided tasks, activities and interaction patterns in classrooms so as to inspire and improve student's performance in Social Studies.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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