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Ability and Location Differences in the Effects of Guided Inquiry on Nigerian Students' Achievement in Social Studies Curriculum

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Abstract

In line with global challenges, the education system in Nigeria is advocating a shift from teacher to student-centered instructional methods such as Guided Inquiry. This study sought to examine the effects of the guided inquiry method (GIM) on students' achievement in Social Studies curriculum in Anambra State relative to location and ability. It was guided by two research questions and two null hypotheses. The study was a quasi experimental design. Sample involved 160 JSS III Social Studies students selected through stratified random sampling technique from four randomly drawn secondary schools in Anambra State. A 20-item Social Studies Test was used to collect pre-test and post-test data for the study. The data obtained from the students were analysed using mean scores, standard deviation, t-test and the analysis of co-variance. Findings indicated that there were significant improvements in the mean scores of high and low ability learners in urban and rural school locations taught Social Studies with the Guided Inquiry method. This implies that irrespective of ability and school location, the guided inquiry method is more effective in raising students' achievement in selected concepts of Social Studies curriculum more than the lecture method. Based on these findings, it was recommended among other things that in order to enhance students' learning in Social Studies, new activity-based instructional strategies such as GIM should be adopted in secondary schools especially in teaching the subject to Junior secondary school students irrespective of their ability levels and school location.

Keywords: Social studies, curriculum, academic achievement, ability, school location, guided inquiry, social interactions

1.0 Introduction

Recent global initiatives have increasingly emphasized the importance of education for developing good human relationships, multi-cultural awareness, leadership and social skills for responsible citizenship. Education is also highly advocated as an instrument for bringing about peace-orientation in individuals, nurturing in students the values, attitudes and outlook needed for global participation; reinforcing social justice as well as propagating a secular and democratic culture (Organisation for Economic Co-operation and Development, 2012). One of the subjects in school curriculum for achieving these is Social Studies. In Nigeria, evidences abound that students' achievement of Social Studies curriculum is below standards that can be said to be acceptable.

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Students' poor achievement arises from the dominancy of traditional teacher centered teaching methods. To improve students' achievement of the curriculum, an extensive modification in teaching must be noted. Focus on active learning methods, especially the guided inquiry method, is one of the recommended solutions for the problems arising from applying traditional methods.

As yet there have been few studies in Nigeria that have examined the effects of guided inquiry on students' achievement of Social Studies curriculum contents in relation to their academic abilities and gender. This study contributes to closing this gap by empirically investigating whether students taught the Social Studies curriculum through Guided Inquiry Method (GIM) achieved higher gain in achievement scores that those taught with the lecture method. The students who were tested in this study included those with high and low academic ability levels in urban and rural schools which meant that the empirical research was also able to examine whether there were significant differences in the level of academic achievement displayed by students in different school locations and with different academic ability levels.

1.1 Background to the Problem

In Nigeria, Social studies is a compulsory subject at the basic education level (Basic 1-9). It is expected that exposure to the Social Studies curriculum would teach learners to become aware and conscious of their immediate social and physical environment, as well as their civic responsibilities.

By its very nature as an interdisciplinary subject, exposure to the Social Studies curriculum is expected to provide learners with useful knowledge, skills and attitudes for national integration, socio-economic development, as well as global participation (Nigerian Educational Research and Development Council, 2007; Okobiah, 2012).

However, the extent to which the Social Studies curriculum has lived up to these expectations is presently undermined by unimpressive achievement of students in the subject. Studies have shown that on the average, Nigerian students' achievement in the subject in their individual school-based examinations and the Basic School Certificate Examination, has been abysmally poor (Eze, 2009; Ezegbe, 2008; Okobiah, 2012). This poor achievement applies to high and low ability students in urban and rural secondary schools in Nigeria (Edinyang & Ubi, 2012). Poor achievement in Social Studies implies that the students have not mastered nor internalized the content of the curriculum and cannot possibly apply the cognitive, affective and psychomotor stipulations of the curriculum to real life situations. There is therefore a serious concern about factors that undermine students' achievement of the curriculum such as academic ability, school location and instructional methods, and their instructional enhancement strategies.

1.2 Students' Achievement as a Function of Academic Ability and School Location

Academic achievement is described as the relative positions of students learning outcomes to a set objective of a curriculum (Stinebrickner & Stinebrickner, 2009) as well as the judgments of pupils' scores on a test (Agboola & Oyemede, 2007). In this study, academic achievement is the described in terms of the amount of gain in knowledge of students as a result of being exposed and taking part in a curriculum package. Academic achievement in this study is further compared based on academic ability level. Ability level is defined in terms of a students' relative achievement of the curriculum among others in a class. It is often categorized into high and low ability levels. While high ability refers to those that score above 60 percentiles in tests, low ability refers to those that score less than the 40 percentile (Hanson, 2010). These abilities differentiate high-achieving students from low-achieving students (Kitsantas, 2002). Some authors suggests that prior ability is significantly related to academic achievement (DeBerard, Spielmans, & Julka, 2004; Stumpf & Stanley, 2002).

Ayodeji (2009) and Okobiah (2012) also suggested that differences in low- and high-achieving students are closely linked to instructional methods used in delivering the curriculum. This implies that the students' ability to understand social concepts and phenomenon may largely determine their achievement in a Social Studies curriculum depending on the method of instructional delivery.

School location is another factor that affects students' achievement. Although there are more opportunities for socio-cultural activities as well as many opportunities for students to utilize community resources for learning and out-of-school interaction, Arbaugh (2000) and Endreny (2010) respectively observed that schools in urban settings enjoyed better advantages in terms of funding, enhanced social and physical environment, teacher quality and academic support systems, than those in rural schools. Thus, urban schools are significantly advantaged to rural schools in terms of, educational resources, teacher quality and students' achievements. Rural education in many less developed countries is often synonymous with disadvantages for learning. Hence, Ahmad (2009) found that students studying in urban schools performed better in academic achievement than students studying in rural schools. Other studies reported significant difference in academic performance between adolescents residing in rural and urban area without any direction (Ayodeji, 2009; Hanson, 2010). Moreover, even though rural-urban disparities are an important form of educational inequality in less developed countries, the instructional strategies for reducing such disparities in student learning have not sufficient been empirically examined systematically. The present study sets out to fill this lacuna by looking at the extent to which Guided Inquiry Method, an innovative instructional strategy, could improve Social studies achievement for rural and urban students.

1.3 Guided Inquiry Method

Guided Inquiry Method (GIM) is a student-centered and teacher-guided instructional approach that engages students in investigating real world issues within a broad thematic framework (Azizmalayeri, Jafari, Sharif, Asgari & Omidi 2012). It emphasizes students' involvement in observing, probing of events, issues and phenomena specified in the curriculum. Students have more freedom to participate, carry out investigations and take ownership of their learning. They are given opportunity to apply their knowledge with inquiry because they are expected to investigate in a way that makes sense to them rather than to the teacher.

The investigation is set in an in-school or out-of school setting in order to solve simulated or real world problems. The role of the teacher in this method is to guide to students generate or have interest in a problem oriented question, gather and use evidence to form and evaluate explanations or hypotheses to these questions, and communicate and justify their explanations in the context of general understanding of curriculum.

The role of the teacher in GIM is very different from that during traditional style teaching. Instead of the traditional role of master instructor, the teacher becomes a guide and adviser in a co-operative aspect of the learning process. In the traditional lecture method, the teacher sets detailed learning objectives, plans the effective use of time, ensures classroom safety, and arranges the availability of materials. This setting tends to be strongly teacher-directed in its nature, in the physical setting and use of resources. The teacher is more active and students are passive but the teacher also uses question answers to keep them attentive in the class. That means the teacher-centered teaching happens in a highly teacher dominated environment. Guided Inquiry-based instructional approaches reverse this trend, placing students at the helm of the learning process and teachers in the role of learning facilitator, coach, and model (Summers & Dickinson, 2012).

Guided Inquiry-based teaching is strongly recommended by the Nigerian Educational Research and Development Council (NERDC, 2007) and the Curriculum Organisation of Nigeria (CON, 2009) as a strategy to develop deeper student understanding and achievement of Social Studies curriculum. Studies have shown that teaching through the guided inquiry method results in increased understanding of curriculum concepts, improvement of academic achievement and more utilization of critical thinking (Dunkan & Arthurs, 2012; Gautreau & Binns, 2012). Some authors have clearly recommend that teachers should be spending more time using inquiry-based instructional strategies in problem-solving contexts, and less time in didactic presentations of facts.

Yet studies suggest that most teachers have very little experience with inquiry, and thus possess very naive and informal conceptions of inquiry and theoretical underpinnings of guided inquiry in the classroom (Blanchard, Southerland, Osborne, Sampson, Annetta & Granger, 2010; Chinn, 2006). Hence, they do not apply guided inquiry in the classrooms.

1.4 Theoretical Framework

Vygotsky's socio-cultural theory of learning is considered appropriate for this study. Three essential tenets of Vygotsky's theory (1978) are the notion of the existence of what he called the zone of proximal development, social matrix and assisted performance as illustrated in Figure 1.

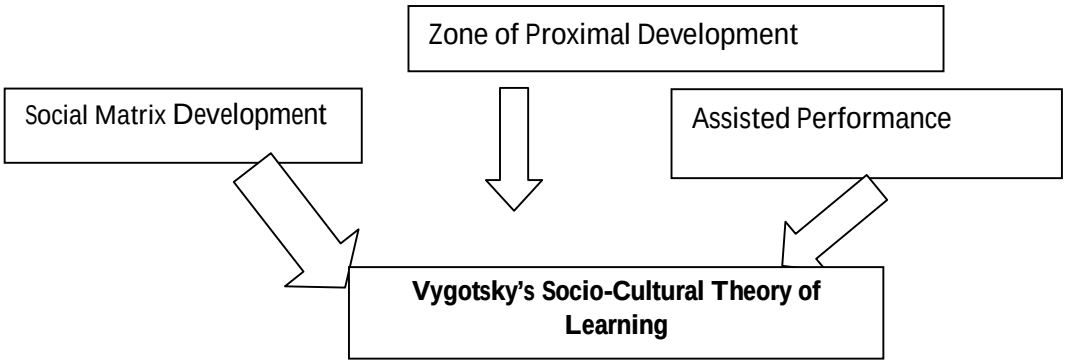

Figure 1: Authors' Illustration of three Essential Tenets of Vygotsky's Theory

The zone of proximal development is the distance between what children can do by themselves and the next learning that they can be helped to achieve with competent assistance. In essence, zone of proximal development (ZPD) is the difference between the child's capacity to solve problems on his own (ability level), and his capacity to solve them with assistance of someone else (Guided Inquiry). Children of various ability levels could be taught any subject effectively by providing assistance at the ZPD.

Vygotsky also believed that children do not develop in isolation, but rather in a social matrix. This social matrix is formed by the interconnection of environment (school location) social relationships with experts and social interaction with peers. There may be factors that could influence learning at the zone of proximal development. These factors may be natural (E.g. ability levels) or environment (E.g. school location or instructional method). The influence of these factors could be reduced through classroom interactions. Such interactions could be facilitated in a Social Studies class through guided inquiry activities such as field trips to community places or school environment, questions, guided note-taking, problem-solving, classroom discussions, hands-on activities and project works.

Finally, Vygotsky propounded that teaching must be redefined as assisted performance, where teachers assist the children by providing structure and guidance in their work. Assisted performance also occurs between children when they participate in learning experiences whereby a teacher provides information that increases students' understanding of the learning content. It can also occur when a teacher guides students through an inquiry process of learning. When teaching is structured under the concept of assisted performance, it works within the zone at points where children's performance requires assistance (Kornell & Metacalfe, 2006). The postulations of Vygotsky lead one to believe that learning environments for children should involve guided interaction and they should change their conceptions through intelligent action, speech, and communication. It follows that teachers utilize guided method to help students develop their understanding of basic Social Studies concepts by utilizing Vygotskian socio-cultural learning theory. Although incorporating guided inquiry has been shown as an effective way to teach content (Wilson et al., 2010), results have been inconclusive at times, warranting further studies such as the present study.

2.0 Research Questions

The specific research questions guiding the study are:

1. What are the mean achievement gains of low and high ability students taught Social Studies with Guided Inquiry Method (GIM) and those taught with the Traditional Lecture Method (TLM)?
2. What are the mean achievement gains of students in urban and rural school Guided Inquiry Method (GIM) and those taught with the Traditional Lecture Method (TLM)?

3. 0 Hypotheses

The following null hypotheses were tested in the study at 0.05 level of significance:

1. There is no significant difference between the mean achievement gains of low and high ability students taught Social Studies with Guided Inquiry Method (GIM).
2. There is no significant difference between the mean achievement gains of students in urban and rural schools taught Social Studies with GIM.

4.0 Methods

4.1 Design of the Study

To conduct the present study, the quasi-experimental research design was applied. Specifically, non-equivalent pretest-posttest control group design was used. The design was a multi-factor design consisting of the dependant variables of teaching method, ability and school location as factors. Given the design, students in selected intact classes were randomized into two experimental and control groups. 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 curriculum achievement gains.

4.2 Sample and Sampling Technique

Participants in the present study were 160 JSS III Social Studies students [80 from urban and 80 from rural schools] 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 location of the schools [i.e urban schools and rural schools]. Two urban and two rural schools were selected. Then, in each of the selected schools, one intact JSS class was selected totaling 4 intact classes of 160 JSS III students. Within this sample, the experimental group had 19 high ability and 44 low ability students, while the control group had 17 high ability and 48 low ability students. These ability levels were determined by students' achievement levels in the pre-test. High ability students were those whose performances fall within the upper 30% of the students based on their scores on the pre-test, while low ability students was defined as the lower 30%. The classes were further randomly assigned to experimental (80) and control (80) classes.

4.3 Instrument

A Social Studies Achievement Test **[**SSAT] was used in this work. The test consisted of 5 essay type social dilemma questions on Social Studies. This test, duly validated by Social Studies experts 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 questions was 20 marks [total 100 marks]

4.4 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=80] was randomly assigned to be taught the Social Studies curriculum with GIM. The other group [N=80] was taught Social Studies curriculum through the Traditional Lecture Method. The GIM group was the experimental group while the TLM 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.

Two weeks prior to the experiments, the students 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 curriculum already possessed by subjects before the study. It also served as a comparison to the posttest to determine if any curriculum 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 eight weeks, the tests were repeated following the same procedures as in the pre-test. The essence of this post-test was to determine the curriculum achievement gains of the students as a result of participating in the experiments. The pre and post tests were duly marked and scored.

4.5 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.

5.0 Results

Table 1: Means, Standard Deviations and Achievement Gains of Low and High Ability Students in Experimental and Control Groups

Treatment Groups		Pre-test		Post test		Gain
	N	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$
Low Ability Control Group (CLM)	48	28.92	6.42	33.95	6.93	5.03
Low Ability Experimental Group (GIM)	44	28.55	5.80	49.75	8.99	21.2
High Ability Control Group (EM)	17 19	65.76	3.96	69.76	5.48	4.00
High Ability Experimental Group (GIM		65.42	4.90	74.53	6.83	9.11

In Table 1, the pre test means of low ability students in the control group (Traditional Method) was 28.92 while that of low ability students in the Experimental Group (Guided Inquiry) was 28.55. In the post test, the mean scores of low ability students in the control group (Traditional Method) rose to 33.95 by a mean gain of 5.03. The post test mean score for low ability students in the experimental group (Guided Inquiry) was also raised to 49.75 by a mean gain of 21.2.

For high ability students in the control group, their mean pretest score was 65.76, their post test score was 69.76 while their mean gain score was 4.00. Their counterparts in the Experimental Group (Guided Inquiry) had a pre test mean score of 65.42 which improved to 74.53 in the posttest by a mean gain of 9.11. By this analysis, the mean academic achievement gains of low and high ability students in the experimental group (Guided Inquiry) were higher than those of the control group taught with the Traditional Method.

To ascertain if improvement gains varied between low and high ability students in the experimental group, a t-test was performed to test null hypothesis one and presented in Table.2.

Table 2: Independent Samples Test for Pre-Test and Post Test Mean Academic Achievement of Low And High Ability Students in the Guided Inquiry Group

Group		Mean	Sd	Df	t-cal	t-crit	Decision P<0.05
Pre test	Low Ability (GIM, N=44)	28.55	5.80	61	24.19	1.96	Significant
	High Ability Experimental Group (GIM, N=19)	65.42	4.90				
Post test	Low Ability (GIM, N=44)	49.75	8.99	61	10.73	1.96	Significant
	High Ability (GIM, N=19)	74.53	6.82				

Table 2 reveals that the t-calculated value between low and high ability students in the Guided Inquiry group was 24.19 in the pre-test, while their t-calculated was 10.73 in the post test. These values were greater than the t-critical value of 1.96 at 61 degree of freedom (P<0.05). The decision is to reject the null hypothesis and uphold that there is a significant difference between the mean achievement gains of low and high ability students taught Social Studies with Guided Inquiry Method (GIM).

Table 3: Means, Standard Deviations and Achievement Gains of Urban and Rural Ability Students in Experimental and Control Groups

		Pre-test		**Post test**		**Gain**
Treatment Groups	N	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$
Urban Experimental Group (GIM)	46	32.39	12.10	51.46	13.35	19.07
Urban Control Group (GIM)	43	36.73	18.74	41.73	17.92	5.00
Rural Experimental Group (GIM)	34	35.00	10.36	55.48	12.73	20.48
Rural Control Group (GIM)	37	35.02	16.77	39.61	19.53	4.59

In Table 3, urban students in the GIM group had a mean gain of 19.07 compared to those in the TLM group with a mean gain of 5.00. Rural students in the GIM group, had a mean gain of 20.48 compared to those in the TLM group with a mean gain of 4.59.

These findings indicate that urban and rural students in GIM group obtained higher mean gains in the same Social Studies Achievement tests after the experiment than those in the TLM. To test the significances in achievement of students in urban and rural school locations, ANCOVA was applied as shown in Table 4.

Table 4: Analysis of Covariance for the Pre test and Post Test Achievement Gains of Groups based on Location (P $\angle$ 0.05)

Source of Variation	**Sum of Squares**	**Degree of freedom**	**Mean Square**	**F- Cal**	**F-Crit**
Corrected Model	6112.94	3	2037.64	9.42	3.84
Intercept	420270.53	1	420270.53	1943.76	3.84
Sch. loc	6112.94	3	2037.64	9.42	3.84
Error	33729.54	156	216.215		
Total	460751.00	160			
Corrected Total	39842.48	159			

In Table 4, the F-calculated value is 9.42 while the F-critical is 3.84 at 3/156 degrees of freedom ($P<0.05$). The F-calculated exceeds the F-critical so the decision is to reject the null hypothesis. Therefore, there is a significant difference in academic achievement in Social Studies between urban and rural students, who received instructions through GIM and TLM.

5. 1 Discussion of Findings

The findings of the study revealed that achievement of the Social Studies curriculum differed between the high and low ability students in the experimental and control groups. Prior to the commencement of the experiment, high and low ability students in both groups had equivalent levels of achievement of the curriculum as indicated by their pretest scores. However, there were wide variations between the post test scores of the experimental and control groups both low and high ability students taught with the guided inquiry achieved higher post test mean scores than those taught with the traditional method. This finding suggests that GIM has an overall high positive effect on students' achievement in the selected Social Studies curriculum irrespective of ability levels, more than TLM.

The test of null hypothesis one showed that academic achievement differed significantly between the low and high ability students taught with the guided inquiry method. Ability levels affected the students' academic performance when they were exposed to the guided inquiry method. For instance, high ability students continued to achieve significantly higher scores than low ability students from the pre-test through the post test. Perhaps, the activities in the guided inquiry method were very challenging and engaging for the high ability students that their scores in the pre-test did not decline, rather their scores consistently improved. This finding agrees with Edinyang & Ubi, 2012) that when high ability students were challenged by inquiry activities in Social Studies, their high performances persisted and improved over time.

Two possible interpretations could be given for this result. The first one is that the use of guided inquiry method did not automatically close the achievement gap between high and low ability learners, but it did not widen the gap either. It could allow low ability students to improve their academic achievement levels over time. The other explanation is that the significant difference suggests that academic achievement improved significantly for both the low and high ability students taught with the guided inquiry method. The mean gain of low ability students was 21.2 compared with a mean gain of 9.11 obtained by high ability students in the same group. One can therefore, argue that on the surface level, the use of guided inquiry method improved academic achievement of low ability students more than those of high ability students in the same group. This second explanation is because the guided inquiry method is characterized by high level of involvement by both high and low ability students. Furthermore, as Dunkan & Arthurs (2012) noted, it samples a real life situation, which allows the high and low ability participants to learn from a well-documented series of tasks.

In addition, the test of hypothesis two found that there was a significant difference in students' academic achievement in Social Studies as a result of school location, between students who receive instructions through GIM and those who received instruction through TLM. GIM improved achievement for students irrespective of urban or rural school locations more than TLM. This significant difference between students in different school locations could be due to teaching techniques or practices used by the teachers in the experimental and control groups. In this study, projects, a variety of instructional materials and practical lessons were incorporated into the curriculum presented to students in the GIM group.

Students in both urban and rural areas also had the opportunity of learning the curriculum content from not only their teacher but also from one another. By so doing, they used one another and their teachers as learning resources. These activities could have cushioned the effects of perceived inadequacies in school location. The various classroom activities might have contributed to raise the excitement level of the students and improve their learning. This concurs with Azizmalayer et al (2012) who noted that interesting community resources, debates, posters, or field trips, when combined with teacher-led and peer based social interactions motivate learners by capturing learners' attention and curiosity.

This guided inquiry can enhance students' ability to learn effectively from their peers even when instructional resources, teaching and aids and teacher time are insufficient in urban and rural areas. This finding is also in line with Vygotsky's (1978) postulations on "zone of proximal development". This zone defines the functions that have not yet matured in students perhaps as a result of school locational factors but may be in the maturation process. With the students interacting and communicating with one another as guided by teacher inquires, their zone of proximal development would be affected, irrespective of school location. However when the students assisted each other in higher levels of learning as well as how to structure and manage their own learning in the GIM, they worked in the zone of proximal development. One can therefore say that GIM is more effective in improving students' academic achievement of Social Students curriculum over and above the Traditional Lecture Method, even in the context of inadequate school location.

5.2 Recommendations

Based on the findings discussed above, the following recommendations are made;

1. Opportunities for functional learning could be provided in the curriculum through the use of Guided Inquiry Method. This would enable students of high and low ability levels in urban and rural school locations learn basic Social skills and gain confidence in their ability to reliably gather and interpret facts as they learn from their own inquiry.
2. The teacher-training curriculum in Nigeria should include Guided Inquiry Methods in order to equip would-be teachers with the techniques and processes involved in the strategies.
3. Social Studies teachers should be encouraged to use GIM to ensure that students of every ability level engage in practical Social Studies curriculum tasks. This would save the cost of high technology materials as well as promote students' achievement in Social Studies.
4. Social Studies specialists should collaborate with NERDC or other support services to produce GIM packages and materials suitable for the Nigerian learners.
5. It is necessary for, textbooks writers and publishers to provide for guided Inquiry based learning experiences in the form of illustrations or step-by-step tutorial in their textbooks so that learners using them can develop their interest.

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