

EFFECTS OF ACTIVE LEARNING STRATEGIES ON SECONDARY SCHOOL STUDENTS' ATTITUDE IN GEOGRAPHY MAP READING IN MANGU AREA, PLATEAU STATE, NIGERIA

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ABSTRACT

The study examined the effects of active learning strategies on secondary school students' attitude towards map reading in Mangu Area of Plateau State, Nigeria. Two specific objectives, two research questions and two hypotheses were formulated to guide the conduct of this study. The study adopted the quasi-experimental design particularly, the non-equivalent group pre-test post-test. The sample for the study comprises of 59 students where 31 students are in the experimental group while 28 are from the control. The Attitude Towards Geography Map Reading Questionnaire (AGMRQ) was the instrument used for data collection and was valid and reliable with a reliability index of 0.98. The mean, percentages, student t-test and ANCOVA were used to analyse the data. The results indicated that students had negative attitude towards map reading in the pre-test. While in the post-test, many students from the experimental group have positive attitudes towards map reading compared to their counterpart in the control group which had negative attitudes. The hypothesis result indicated that there is no significant difference between pre-test attitude scores of the experimental and control groups. On the other hand, the post-test indicated that there is a significant difference between students' attitude towards map reading in favour of the experimental group. It was concluded that students taught with active learning strategies have positive attitudes towards map reading. Therefore, active learning strategies are effective for teaching map reading in secondary school. It was recommended that geography teacher are to be encouraged to use active learning strategies for teaching map reading in secondary schools. In addition, seminar, workshops and special trainings should be organised on regular basis to teach, train and create awareness to geography teacher on the effectiveness of active learning strategies for teaching map reading.

INTRODUCTION

Learning takes place throughout life and occurs when a person sees, hears and comes in contact with and manipulates objects and facilities in one's surroundings. It takes place in different ways and occurs both within the home and the school environment and the type of knowledge acquired might be as a result of what the individual was exposed to and the person's ability to interact and interpret those things at the disposal of that individual. The interaction of the individual learner with everything in the learners surrounding (either with fellow human beings or other objects) is very important to the intellectual development of the learner especially for the experiences within the school environment that are more organised than in other environments. In the school environment, what is to be learned is pre-planned, documented and taught to the learner in phases based on the level that the learner had reached in education. In the secondary school setting in Nigeria, learning experiences are organised based on subject areas such as Physics, Chemistry, Biology, Agricultural Sciences, Economics, History and Geography, where the knowledge, skills and attitude to be acquired are interwoven such that the learner comes out a better person. This implies that each subject area in secondary school comprises of contents peculiar to the objectives stipulated to be achieved that discipline and those contents are related to the contents of other subject areas.

The knowledge to be acquired in geography is important in the growth and development of the learner because its study provides learners with concrete knowledge of the environment as well as learners to appreciate and value the environment. Geography builds in the learner a sense of responsibility towards the environment by providing the information on the resources available, how to harness and transformed the resources as well as measures to be taken in the management (Akintade, 2012). Geography basically, is a science of spatial relationships which focuses on the interaction between man and the environment and how both are being influenced by such relationships (Mohammed, 2014). It is thus a science of synthesis which seeks to understand the character of a place in terms of total integration of the various phenomena which characterise a place as well as interrelationships between places. The knowledge of geography is sub-divided into six major themes namely; Map Reading and Interpretation, Physical, Regional, Human, Climate Change and Geographic Information and Systems. Each of these major themes is broken down to contents of varying magnitudes that have been organised to be acquired by the students within three years in the senior secondary school before the external examination. The contents cut across simple, difficult and abstract based on the views of both teachers and students (Tuna, 2012). 60% of the abstract and difficult topics are contained in map reading and interpretation where teachers do not usually want to teach and students also do not want to attempt questions related to them in external examination (Tuna, 2012).

The difficulty faced in teaching and learning of the content of map reading affects the preparation of students for SSCE and prevents the students from doing well in the examination implying that the students would not perform well and would also be discouraged to attempt such questions. More so that about 40% of the objective (20 out of the 50 objectives meaning 30 of the objective questions were shared amongst the other six topics) and section A of geography I question papers for SSCE over the years comes from map reading and interpretation and those are compulsory questions for students. This implies that failure of students in those sections affects the general performance of students in geography likewise, their attitude towards the subject. This has been the trend in the SSCE question papers but the same attitude is repeated over the years and when nothing is done about the instructional process of map reading such that students are fully prepared before the examination, the problem will keep repeating its self. That means a lot to the development of the learners and the nation at large since the knowledge of geography is paramount in providing useful information about the issues in the world and how such issues are solved. For instance, the problem of global warming as it affects countries and regions, food and energy scarcity, degradation of land and soils from over use and misuse among others. It is important to know that the knowledge and skill to be acquired will help in laying a sound foundation for future land surveyors, urban and regional planners, architects, estate managers, climatologists and others who will contribute to national development. Thus, it is important to note that every branch of Geography lays good foundations for students to enrol in many courses in higher educational levels.

Many factors such as lack of instructional materials, laboratories, unqualified teachers, negative attitude to learning by students, poor teaching methods among others have been attributed to students not getting themselves ready for the examination in Geography. However, poor teaching method is one of the factors that are most common among researchers (Sofowora & Egbadokun, 2010; Olusegun, 2014). Furthermore, Olusegun revealed that most Geography teachers usually employ lecture method (talk and chalk method) to teach the contents of map reading instead of using active learning methods. The conventional lecture strategy being the dominant approach used by teachers in Nigeria does not actively involved in developing the knowledge; they generally remain passive throughout the lesson, hence the strategy is mainly a teacher-centered approach to learning science (Olusegun, 2014).

In view of the lapses inherent in the conventional lecture strategy of teaching Geography, particularly map reading, researchers are continually making efforts towards proffering ways to improve students' achievement in Geography (inquiry-based approach, concept mapping and use of portfolio assessment technique by Qadan, 2016; Wakjissa, 2016; Kelfine, Maiyo & Okere, 2018).

There were also training and retraining workshops organized by Science Teachers Association of Nigeria (STAN) on how to improve teachers' instructional delivery capacity and by extension, change students' attitude positively towards map reading and geography in general. Despite these efforts, much appreciable improvement has not been recorded in students' attitude towards Geography and map reading in particular. In view of the aforementioned, it becomes imperative for more research in discovering better teaching methods that could enhance students' attitude towards geography.

There are many students' centred instructional strategies (such as experimental learning, cooperative learning, problem-solving exercises, writing tasks, class discussion, case study methods, simulations, role-playing, field work, independent study and computer aided instruction among others) that could be combined to assist geography teachers to get students actively engaged and involved in the map reading instructional process. The students' centred methods emphasize students' inquisitiveness, practical orientation and critical thinking and also emphasize acquisition of the skills of investigating, interpreting and synthesizing information. Such conditions of learning are active learning strategies and they provide opportunities for students to actively engage in classroom activities during instructions in map reading.

Active learning strategies also encompass various practices such as pausing in lectures for students to consolidate their notes, incorporate survey instruments, get involved in quizzes and take part in field trips and discussions. For instance, in active learning, teachers might ask students to respond to questions, summarize important concepts in writing, or compare notes with their peers, engage in new material while the teachers serve as guides by helping the students to learn and as well apply the information acquired in other situations. Thus, the active learning strategies used for instruction in map reading are activities such as group discussions, taking measurements on the ground while on field trip and on maps while in the classroom, recording results, making calculations (e.g. distances and gradient), studying topographical maps, enlarging and reducing portions of topographical maps, identifying and drawing of cross section maps and holding quizzes by the students among other things. Whatever is learned in the activity based classroom could be as a result of the students' involvement and interaction instead of their teachers' efforts.

The active learning package developed for the present study covers the complete content of map reading in secondary school and is a combination of active learning strategies and methods that are student centred in nature. It is believed that it will enhance excellent performance of students in map reading as discovered by Tedla & Sewasew (2016). Tedla & Sewasew found that using active learning methods for instruction improve students' performance in geography and that students' performance is related to their attitude. This implies that improvement in the performance of students in any discipline leads to positive change in attitude of students in that subject.

Attitude is a settled behaviour or manner of acting and is a representation of feeling or opinion which could be negative or positive. A positive attitude causes a chain reaction of positive thought, events and outcomes and students with positive attitudes towards schooling and school subjects are seen to have greater achievement than those with negative attitudes. It has also been found that failure or success in life is proportional to one's attitude and that one's attitude either destroys or builds that person (Ugondulunwa & Wakjissa, 2016). Thus, students' attitude towards learning serves as foundation for their success or failure. Attitude influences the way an individual behaves towards an object institute or a person (Adoga, 2013). Attitude therefore, can spark extraordinary results and sometimes depends on experiences where a good and pleasant experience leads to positive attitudes whereas bad and unpleasant experiences breed negative attitudes.

The condition of learning in most secondary schools does not encourage the students with their studies. The schools are faced with some challenges that may affect the students' attitude and performance in any field of knowledge. As it is known that schools are meant to inspire and spur learning but not all schools have such provisions. As part of the ways to make the learning condition of the students better and conducive is to make sure they are actively involved in the learning process. It is against this background that the present study intends to determine the effects of Active Learning Strategies (ALS) on secondary school students' attitude in Geography map reading.

In spite of the importance of the knowledge of Geography to youth empowerment and national development, students' achievement in the subject has not been encouraging. For instance, most of the students scored below the pass mark in Geography, which was attributed mostly to candidates' poor preparation before examination. Students confess that it is difficult to understand and pass geography. Najib, Ahmed and Aminu (2020) and Tuna (2012), in their study on survey of difficult concepts in senior secondary school Geography in Jigawa State and in Turkey respectively found that map reading was one of the most occurring areas that students identified that poses problem for them in the study of Geography. Hence, students do have none challan attitudes towards geography specifically, map reading and interpretation. Such attitude leads to inadequate preparation before examination which leads to low performance of students in map reading and geography at large. In addition, geography teachers use lecture method in the instructional process of map reading and as a result of that, students were unable to identify, read and interpret some features of settlements and communication lines, reduce as well as enlarge portions of the topographical maps and to insert features on the maps (Chief examiner's report for NECO 2022-2024, WAEC 2017).

An ideal instructional process requires the use active learning strategies because they are student centred and will help students to actively engage in the learning process. This help the students to have constant practice thereby prepare adequately before examinations so that there will be good attempts for the questions leading to good students' achievement. Therefore, study was undertaken to find out the deference between experimental and control groups of secondary school II students' attitude towards map reading before after exposure to treatment.

RESEARCH QUESTIONS

The following research questions were posed to which answers were sought:

1. What is the deference between experimental and control groups of secondary school II students' attitude towards map reading before the treatment?
2. What is the deference between experimental and control groups of secondary school II students' attitude towards map reading after the treatment?

HYPOTHESES

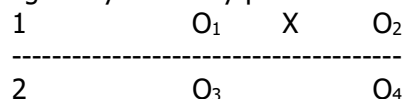
The following hypotheses were formulated and tested at the 0.05 level of significance:

1. There is no significant difference between the map reading attitude mean scores of the senior secondary school II students before the treatment.
2. There is no significant difference between the map reading attitude mean scores of the secondary school II students after the treatment.

METHODS

The design adopted for the research work was the quasi-experimental design particularly, the non-equivalent group pre-test- post-test design because there was no random assignment of subjects to either experimental or control groups. The design gives room for intact class to be used for the research work even when they do not constitute of the same subjects. The design allows the schools to be randomly selected and assign to the experimental and control groups.

The design is symbolically presented thus:



The design has 1 as the experimental group and 2 as the control group. O₁ and O₃ represent the pre-test to be given to experimental and control groups respectively while O₂ and O₄ stand for the post-test for the two groups in that order. This means that the two groups will be pre-tested as O₁ and O₃ and will equally be post-tested as O₂ and O₄. The X in the design represents treatment administered to the experimental group while the blank space in the design indicates lack of

treatment on the control group. The dotted line in the design shows that there is no randomization of the sample of students to either of experimental and control groups.

The sample of the study comprised of the entire SSII students that offer geography (59 students, 31 in experimental group while 28 in control group) from two selected senior secondary schools in Mangu Local Government Area. The selection of SSII was because the students have been exposed to Geography for at least one year and map reading is among the topics covered in SSII. The simple random sampling technique was used to select the schools and to assign them to experimental and control groups. The names of the schools were written on pieces of paper and were dropped in a basket. The basket was shaken to mix the papers and the researcher picked two pieces of paper from the basket, one after another. The schools picked from the basket were used for the study. The same process was repeated in assigning the schools to the experimental and control groups.

The Attitude towards Geography Map Reading Questionnaire (AGMRQ) was the instrument used for data collection both before and after the experiment as pre-test and post-test. The instrument is a five point Likert scale made up of Section A (containing Biodata) and Section B (containing 56 items). To validate the instrument, the consent of 4 competent experts, one each from Geography, Research, Measurement and Evaluation Units, Educational Psychology (all from University of Jos) and one secondary school geography teacher were sought in order to ensure thorough and appropriate scrutiny of the instrument. The decisions of the experts indicated that the developed instrument was valid. The construct validity of the AGMRQ was established using factor analysis. The instrument was pilot tested on 24 students from four schools (two private and two public) within the study area which were not part of the sample of the study. The data obtained were analysed. The Cronbach Alpha method of internal consistency was used to estimate the reliability of the AGMRQ and a coefficient of 0.98 was obtained which made the instrument reliable as explained by Awotunde and Ugodulunwa (2004) that any coefficient between 0.7 and above is generally accepted as a sign of acceptable reliability.

With the permission from the various school authorities, the consent of the research assistants (SSII geography teachers) was sought after which the following steps were taken: Training of research assistants, Administration of pre-test (AGMRQ), Administration of the treatment (ALS for experimental group & Lecture method for control group) and Administration of the post-test (AGMRQ). Training of research assistants for the two experimental groups took two days. First day was studying the scheme of work, lesson plans and the active learning package and day two was studying how to administer the treatment to the experimental group. Meanwhile for the control group, the research assistants were asked to teach the students with lecture method. The instrument was administered on the first day as the pre-test and also at the last day as the post-test. For the six weeks used for the intervention, the students from the experimental group were engaged in different activities to learn map reading while those in the control group were taught with lecture method.

The collected data were presented on tables were run on SPSS for proper analysis. Thereafter, the result was interpreted and used for answering the research questions and testing the hypotheses. The statistical tools that were used to analyse the data collected were the simple percentages, students' t-test for dependent samples and ANCOVA. These tools were used at different points considering the different sets of data collected and what the results were used for. The data for answering questions one and two were analysed using percentages, the data for testing hypothesis one was analysed using students' t-test while for hypothesis two, the data was analysed with ANCOVA. The result from the computation of the responses showed the nature of the attitude that students have towards map reading. These statistical tools were preferred because the research questions require making the description of the students' attitude and testing the significance of mean difference between two or more groups. Decisions concerning the hypotheses were by comparing the p-value and the 0.05 level of significance. The null hypothesis was retained for

hypothesis one since the p-value is greater than 0.05 and was rejected in the case of hypothesis two because the p-value is less than 0.05 of the level of significance.

RESULTS

Research Question One: What is the deference between experimental and control groups of secondary school II students' attitude towards map reading before the treatment?

Table 1

Pre-test Attitude of Students toward Map Reading in the Experimental and Control Groups

Group	Negative	Attitude Neutral	Positive	Total
Experimental	7(22.6%)	23(74.2%)	1(25.8%)	31(100%)
Control	21 (75%)	7(25%)	-	28(100%)

The result in Table 1 reveals the pretest attitude of the students towards map reading in the experimental and control groups. The table shows that 7 (22.6%) out of the 31 students in the experimental group had negative attitude, 23 (74.2%) had neutral attitude, while 1 (3.2%) student had positive attitude towards map reading before exposure to treatment. The table also reveals that 21 (75%) out of the 28 students in the control group had negative attitude and only 7 (25%) students had neutral attitude towards map reading. This means that majority of the students in both groups had negative and neutral attitude to map reading at the pre-test.

Research Question Two: What is the deference between experimental and control groups of secondary school II students' attitude towards map reading after the treatment?

Table 2

Posttest Attitude of Students towards Map Reading in the Experimental and Control Groups

Group	Negative	Attitude Neutral	Positive	Total
Experimental	-	3(9.7%)	28(90.3%)	31(100%)
Control	17 (60.7%)	11(39.3%)	-	28(100%)

Table 2 reveals the posttest attitude scores of students towards map reading in the experimental and control groups. Three (9.7%) out of the 31 students in the experimental group had neutral attitude, while the remaining 28 (90.3%) students had positive attitude towards map reading after exposure to treatment. Table 2 also indicated that 17 (60.7%) out of the 28 students in the control group had negative attitude, while 11 (39.3%) students had neutral attitude towards map reading. This means that majority of the students in the experimental group had positive attitude towards map reading in the post-test, while, majority of the students in the control group had negative attitude towards map reading at the post-test. This is an indication that active learning approach enables students to develop positive attitude towards map reading.

Hypothesis One: There is no significant difference between the map reading attitude mean scores of the senior secondary school II students before the treatment.

Table 3

Summary of t-test Showing Difference between Pre-test Attitude Scores of Experimental and Control Groups in Map Reading

Group	N	$\bar{X}$	SD	DF	T	p-value	Decision
Experimental	31	119.29	29.02	57	.192	.848	Insignificant
Control	28	117.93	24.98				

Table 3 reveals the result of the pretest attitude of students from the experimental and control groups in map reading before the treatment. In the experimental group, the pre-test attitude mean was 119.29 and standard deviation was 29.02 while the control group has a mean score of 117.93 and standard deviation 24.98. The result also yielded t-value of .192, DF of 57 and P-value of 0.848 showing that $P > 0.05$. Since the P-value of 0.848 is greater than the 0.05 level of significance, the null hypothesis was retained. It was concluded therefore, that there is no significant difference between pre-test attitude scores of the experimental and control groups in map reading. It shows that the pre-test attitude of students' in the two groups were more of negative and almost at the same level.

Hypothesis two: There is no significant difference between the performance mean scores of the experimental and control groups of senior secondary school students in map reading after the treatment.

Table 4
Summary of ANCOVA Result Showing Difference between Posttest Attitude Scores of Experimental and Control Groups in Map Reading

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	101792.808 ^a	2	50896.404	100.770	.000	.783
Intercept	71350.545	1	71350.545	141.268	.000	.716
Preattitude	90.774	1	90.774	.180	.673	.003
Group	101481.722	1	101481.722	200.925	.000	.782
Error	28284.107	56	505.073			
Total	1753226.000	59				
Corrected Total	130076.915	58				

a. R Squared = .783 (Adjusted R Squared = .775)

Analysis of Covariance (ANCOVA) was conducted to determine if a significant difference exists between the map reading attitude mean scores of the secondary school students after treatment in the experimental and control groups. Table 4 shows that $F(1,56) = 200.93$, $p < 0.05$, partial $\eta^2 = .783$, since the p value of 0.000 is less than 0.05 level of significance with an effect size of 78%, the null hypothesis was rejected, indicating that there was a significant effect of active learning strategy on students' attitude towards map reading. On the contrary, the pre-test (covariate) yielded $F(1, 56) = .180$, $P = 0.673$, which was not significant, indicating no significant difference in the attitude mean score between the experimental and control groups before treatment. The result further reveals an adjusted R squared value of .775 which means that 77.5 percent of the variation in the dependent variable which is students' attitude is explained by variation in the treatment, while the remaining is due to other factors not included in this study. Hence, we can say that active learning strategy does increase students' attitude mean score in Map reading.

DISCUSSION

The study determined the effects of active learning strategies on secondary school students' attitude and performance in map reading in Mangu Local Government, Plateau State. The findings on the attitude of secondary school students towards map reading before intervention revealed that majority of students (from both experimental and control groups) had negative attitudes towards map reading. This finding was expected because the students were yet to be taught the content of map reading and so would not have done any better. Hence, the negative attitude could be caused by shallow knowledge of the subject matter since they were yet to be exposed to map reading content. It could also be as a result of a negative resolution by the students that the content of map reading is going to be difficult. Such resolution could lead to students having negative attitudes towards a subject even before being taught and this could result to hatred and phobia for map reading. This is supported by the finding of Okwilagwe (2012) that some Nigerian secondary school teachers do not thoroughly teach some contents of map reading to satisfaction and students end up having shallow knowledge with most of them developing hatred and phobia for it. Ajiboye (2014) found out that some of the contents of map reading were regarded by Nigerian secondary school students as being problematic and so difficult to be learned.

The findings on the attitude of secondary school students towards map reading after the intervention showed that majority of the students in the experimental group had positive attitudes towards map reading as a result of their active involvement in the learning process. The finding was expected since the teachers utilized active learning strategies to teach the content of map reading. The engagement of students in the learning process removes boredom and encourages high level of motivation whereby students were able to retain and transfer the new information or material learned. This enhanced the students to developed interpersonal skills, enabling them to solve problems with little guidance from the teacher. Their exposure to active learning strategies placed the students from the experimental group at a more conducive environment for learning than their counterparts in the control group. These benefits were able to change the orientation of the students towards map reading thereby motivating positive attitudes towards map reading in them. This is supported by Michel et al (2009), Yazici and Demirkaya (2011), Alibi (2012), Mahmud (2014), Richardson (2015), Killian and Bastas (2015), Folade (2016) and Alphan in Dawal (2016) who found that students need to be active in learning because of the benefits they stand to gain and that active learning enables the development of critical thinking, retention and transfer of new information and motivation to learn. In addition, it is an important way of bringing about positive change in students' attitude towards a subject especially in the sciences and geography in particular. Contrary to this is the discovery made by Okwilagwe (2012) that students' attitude still remains negative towards map reading even after exposure to active learning. Therefore, the active learning strategies employed for teaching map reading to secondary school students had indeed enhanced the students' positive changed in attitude towards map reading.

Furthermore, the finding on the difference between the attitude scores of the secondary school students towards map reading before the intervention indicated that there is no significant difference between the pre-test attitude scores of the experimental and control group in map reading. This means that the students from both groups were not different in their attitude towards map reading before the intervention since not much had been learned about map reading by students from both groups before the intervention. It was expected that students will exhibit similar attitudes towards map reading since both groups had similar conditions before the intervention. The finding is in line with Okwilagwe (2012) who found that majority of students had negative attitude towards map reading. On the contrary, Wakjissa (2016) found that attitude of students was neutral in the pre-test.

The findings from the difference between the map reading attitude scores of secondary school students after the intervention revealed that there was a significant difference between the map reading attitude scores of the students in favour of the experimental group. The result for the control group, the attitude of students towards map reading still remain negative even after teaching the content of map reading to them. The attitude of students towards map reading was still negative

because lecture method was used to teach map reading. This indicates that exposing students to active learning strategies facilitates positive change in attitude of students towards map reading. This corresponded to the discovery in the study conducted by Folade (2016) where it was found that the students exposed to student-centred approach significantly had positive change in attitude to learning. Hence, active learning strategies do change students' attitude towards map reading positively. On the contrary, Wakjissa (2016) found that students' attitude towards geography remains neutral even after exposure to treatment.

CONCLUSION

The following conclusions were made. The findings from the research questions indicated that only one quarter of the students from the experimental group had positive attitude towards map reading before being taught map reading. None of the students in the control group had positive attitude toward map reading. After the six weeks' intervention, almost all the students from the experimental groups had positive change in their attitude towards map reading. Particularly, 90% of the students had positive attitudes towards map reading while none of the students from the experimental group had positive attitudes towards geography.

The conclusion of findings from the hypotheses revealed that there is no significant difference between the experimental and control groups of secondary school students' attitude towards map reading before exposure to map reading. While after exposure to active learning strategies, there was a significant difference between the experimental and control groups of secondary school students' attitude towards map reading. Therefore, active learning strategies are effective in changing students' attitude towards geography positively and in increasing the understanding of the content of map reading in secondary school.

RECOMMENDATIONS

The following recommendations were made:

1. Geography teachers are to endeavour that active learning strategies are used to teach map reading in secondary school.
2. A policy should be enacted on the compulsory used of active learning strategies to teach map reading by geography teachers.
3. Seminars, workshops and special trainings are to be organised on regular bases in order to teach, train and create awareness to geography teachers on the effectiveness of active learning strategies for teaching map reading.

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