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Developing Critical Thinking Skills in Geography among Secondary Students in Plateau State by Utilizing Monro and Slater Strategy

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**ABSTRACT**

*This study was conducted to find out the level of developing critical thinking skills in Geography among Secondary Students in Plateau State by Utilizing Monro and Slater Strategy. The study adopted a quasi-experimental pre-test, post-test non-equivalent group design. The population of the study was made up of all the 7,892 geography students in all the senior secondary schools in Northern Educational Zone of Plateau State, Nigeria. The target population was 2,439 SSII Geography students in the study area. The sample of this study was of 85 students from two co-educational senior secondary schools in the study area. The two schools were purposively selected and were randomly assigned to experimental and control group. The experimental group was made up of 34 (24 male & 10 female) students while the control group consists of 51 (27 male and 17 female) students. Students in the experimental group were exposed to Monro and Slater teaching strategy while their counterparts in the control group were taught the same concepts using lecture method respectively. The instrument for data collection was California Test for Critical Thinking Skills (CTCTS) experts from test and measurement, as well as science education determined the face and content validity of the instrument. The Reliability of the instrument was (0.72). Two research questions were answered using descriptive statistics of mean and standard deviation while two hypothesis were formulated and tested using inferential statistics of Z test and t test of independent samples at  $\alpha$  0.05 level of significance. The researcher's selected the teaching objectives covering geographical issues that involves development of students' critical thinking skills in environmental issues. This content was developed according to Monro and Slater Strategy. Findings of the study reveals that there is a significant mean score difference between the experimental and the control group in favour of the experimental group exposed to Monro and Slater strategy and there was no gender difference between male and female students development of critical thinking after the treatment. The researcher made recommendations on the use of Monro and Slater strategy in developing critical thinking for high students' achievement regardless of gender.*

**Key words:** Critical Thinking Skills, Monro and Slater Strategy.

**INTRODUCTION**

In our modern society with population explosion, the labour market always specify its preference on what individuals can effectively offer to any undertaking. Gone are days when paper

qualification stand alone as a yardstick for selection. A challenging and competitive nature of the society has compelled educators and employers to equip students with critical thinking skills to face challenges, to make the right decisions, to build an integrated personality capable of participating in a society, to share different points of views, and ultimately to solve national problems (Rongie, 2019). Elisabet, Gunarhadi and Riyadi (2018) mentioned that, Critical Thinking Skill is a human thinking skill supported with trustworthy arguments. Students can be able to make necessary adjustments on their life challenges to be able to proper solutions to challenging issues. Therefore, it is bond on educators to improve students' critical thinking skills in thematic learning. With critical thinking, Teachers should ascertain basic skills in learning and teaching students with the right system to apply that is in line with in real situations.

There is a significant relationship between teachers' critical thinking and students' educational achievement, (Taghva, Narges, Javad, and Roghaye, 2014). This is an indication that even teachers are expected to have the basic training and knowledge of critical thinking for themselves, so that in every situation the teacher will be a model for the student to be emulating so that logical conclusion, systematic presentation of facts, inductive and deductive reasoning will be applied from classroom discussion, examination and outside the class in general.

According to Alzyadat, (1995) Critical thinking skills is the ability of an individual to assess knowledge, facts, and accuracy in topical analysis for any authoritative knowledge or beliefs in regards to evidence that it supports to arrive at dependable and reasonable conclusion in clear and logical ways. So critical thinking skills when presented are usually corroborating human senses and thinking that never contradicts common sense knowledge. Gunn (1993) defined critical thinking as the mental process to evaluate individual thinking based on established evidence and laws. Elkins (1999) added that critical thinking may involve various components such as imagination, analytical, and cause and effect relationships.

Critical thinking refers to the capabilities and competencies of analyzing a problem or condition in order to integrate all of the existing information about interested issue and achieve a reasonable answer or hypothesis (Warnick and inch, 1994). To succeed and become competent, students should possess the needed critical thinking skills and utilize them in their daily lives, which may allow them to organize and evaluate the information they receive through interaction and other forms of Encounter in School or within the society using different methodology and styles. Researchers have mentioned a number of critical thinking skills that students should possess, such as evaluation, discussions, explanation, hypotheses testing, reasoning, and analysis (Watson & Glaser, 1991), distinguish facts, determine right answers from wrong answers, determine right resources, and the ability to make predictions.

Based on the review of previous research, the researchers noticed that few studies discussed the importance of utilizing modern teaching strategies aimed at developing students' critical thinking skills. Furthermore, previous research indicated that teachers are usually using traditional teaching methods in their classrooms which did not comply with the constructivist teaching procedures that allow the learner to demonstrate his skills of critical thinking. As such, learning in today's world particularly in the study area in just a teacher centered where the learner remain a copying tool of what the teacher presents during instructional periods (McCandless, 2015).

Traditional teaching methods that are based on providing information to students for memorization or rote learning purposes, may negatively impact students' achievements (Alnabulsi, 1995). Based on this finding, educational personnel have developed new teaching strategies aimed at developing critical thinking skills for students like Monro & Slater strategy that is based on the critical thinking of the learner on fact and opinion, (Mohammad, Waleed, Sadeq, and Lana 2014) The importance of developing students' critical thinking skills via different teaching methods has been emphasized by few studies. For example, Asuai (2013) conducted a study on impact of Critical thinking on Performance in Mathematics among Senior Secondary School Students in Lagos State. The study was Quasi-experimental designs that adopted Multi-stage sampling were a sample of 195 students was generated. Mathematics performance test and Watson-glaser Critical Thinking Appraisal were used for the study. Three hypotheses were formulated and tested using Analysis of Covariance (ANCOVA). The study revealed that there was a significant difference in Mathematics performance test scores among the experimental groups. The study also found out that there was no significance gender difference in Mathematics performance test.

Arslan (2012) conducted a study on the influence of environmental education on students' critical thinking and environmental attitudes. The sample of the study included 8th grade students from five schools which were randomly selected from different districts of Sakarya. Survey research method was employed in the study. The Critical Thinking Test in Environmental Education (CTTEE) was used in order to measure critical thinking skills of the students in environmental education. ANCOVA and t-test results also showed a meaningful statistical significance in the students' critical thinking skills and attitudes towards the environment in terms of gender, socio-cultural level and school type the study concludes that Critical Thinking Test in Environmental Education (CTTEE) may be used to identify critical skills of primary school students and the Environmental Attitude Scale may be employed as a useful measurement tool to determine the attitudes of the primary school students toward the environment.

Another study by Husny (2002) measured the effectiveness of teaching History utilizing the style of historical story in developing critical thinking skills for basic level students. The sample consisted of 120 second-grade students in Oman. The results indicated that there were statistical differences in favour of empirical groups taught by using historical story for testing the skill of correlated words.

Alhusny's (2002) study investigated the effect of teaching history via storytelling to develop the critical thinking skills of 120 tenth grade students in Oman. The researcher divided students into one experimental group taught via storytelling and one control group taught via traditional method. The results indicated significant differences in critical thinking skills on the posttest in favor of the experimental group.

Al-Zyadat (2003) conducted a study that investigated the effect of using Gnostic and the Search Pattern Teaching strategy for developing critical thinking skills for 310 ninth grade students for a Geography course in Jordan. The results indicated the development of students' critical thinking skills when taught using the Search Pattern Teaching strategy.

Another study by Khasawneh (2004) attempted to develop critical thinking skills in a history course for tenth-grade students utilizing basic teaching principles. The results indicated an improvement in critical thinking skills in the experimental group. In short, to the researchers' best

knowledge, previous research has not utilized combined teaching strategies to develop critical thinking skills on the national and international level.

### **Statement of the Problem**

Based on the premise that the development of critical thinking skills of students is a concern for academics and practitioners, this study was conducted to investigate the effect of using The Monro and Slater strategy for developing critical thinking skills for all geography students in plateau state, Nigeria.

### **Objectives of the study**

1. To find out the mean difference in developing critical thinking skills for students taught by Monro and Slater strategy and those taught by lecture method
2. To find out the mean gender difference in developing critical thinking skills among secondary school students in geography taught by Monro and Slater strategy

### **Research Questions**

1. Is there any mean difference in developing critical thinking skills for students taught by Monro and Slater strategy and those taught by lecture method?
2. Is there gender mean difference in developing critical thinking skills among secondary school students taught by Monro and Slater strategy?

### **Hypothesis**

- H<sup>1</sup><sub>0</sub> There is no significant mean difference in developing critical thinking skills for students taught by Monro and Slater strategy and those taught by lecture method.
- H<sup>2</sup><sub>0</sub> there is no significant mean gender difference in developing critical thinking skills for students taught by Monro and Slater strategy.

## **METHODOLOGY**

The study adopted a quasi-experimental research design, in which a pre-test, post-test non-equivalent group design was specifically used recommended by (Jack and Norman, 2000). This was because it was not possible to randomize the subjects of the study without disrupting the school programme, therefore two separate intact classes were used as experimental and control groups.

The population of the study was made up of all the 7,892 geography students in all the senior secondary schools in Northern Educational Zone of Plateau State, Nigeria. The target population was 2,439 SSII Geography students in the study area. The choice of SSII students was based on the fact that relative curriculum of geography as a subject was taught and learned by the students and they were in the process of learning without confronting the tension and forbia of senior school certificate examination (SSCE).

The sample of this study was made up of 85 students from two co-educational senior secondary schools in the study area. The schools were purposively sampled from the entire senior secondary schools in the study area with consideration to students that select geography subject. The two purposively sampled schools were randomly assigned to experimental group and control group. Students in the experimental group were exposed to Monro and Slater teaching strategy

while their counterparts in the control group were taught the same concepts using lecture method respectively.

**Table 1:** Sample size and gender of experimental and control group

Group	Population		Total
	Male	Female	
Experimental	24	10	34
Control	34	17	51
Total	58	27	85

The experimental group was made up of 34 (24 male & 10 female) students while the control group consists of 51 (27 male & 17 female) students. The instrument for data collection was California Test for Critical Thinking Skills (CTCTS). The researcher's selected the teaching objectives covering geographical issues that involves development of students' critical thinking skills in environmental issues. This content was developed according to Monro and Slater Strategy: Unit questions developed to distinguish between facts and opinions according to current environmental issues like global warming, flooding, air and noise pollution, bush burning, soil erosion, deforestation, refuse dumping and industrial pollution suggesting activities that students perform for each item, asking students to classify it into facts and opinions, and suggesting additional activities outside the classroom. The instrument was made of up 30 questions selected from the past questions of both WAEC and NECO from (2012-2016)

Face Validation of Instruments California Test for Critical Thinking Skills (CTCTS) was face validated by two senior academic staff in Measurement and Evaluation and two in geography Education from University of Jos. Content Validation of Instruments To ensure content validity of the CTCTS, a table of specification for California Test for Critical Thinking Skills (CTCTS) was developed and it was validated by the experts with specification of Geography curriculum. Two senior academic staff each in Measurement and Evaluation and in geography Education of the University of Jos, validated the CTCTS items. The judges indicated that the content fit to the standard and few changes and modifications were fused into the test instrument.

To test for reliability, the instrument was pilot tested with a group of 17 male students and 11 female students who were part of the population but not included in of the study. The test was administered as a pretest and after six weeks it was administered as a posttest to test the reliability of the instrument, which yielded a result of (0.72) through split half statistical technique using Statistical package for social sciences (SPSS, 22)

**Table 2.** Distribution of Test Items on the Dimensions of the Critical Thinking Skills.

Number	Skill Name	No of Questions
1	Analyzing	6
2	Inducing	5
3	Deducing	7
4	Concluding	5
5	Evaluation	7
	Total	30

There were two groups namely: experimental and control groups. Two lesson plans were developed for the experimental group base on Monro and Slater critical thinking skills another lesson plan for the control group base on lecture method was developed to guide the study by the researcher. The exercise lasted for six consecutive weeks

1. Teacher introduce the topic environmental issues to the students using prepared lesson plan with Instructional Materials and infuse Critical Thinking Skills to teach the topics. These skills are: These skills includes: Analyzing, Inducing, Concluding, Deducing, and Evaluation
2. Topics taught include global warming, flooding, pollution, bush burning, soil erosion, deforestation, refuse dumping and industrial pollution
3. Teacher gave participants room for questions in areas not clear and later responded.
4. Evaluation: Teacher asked students to answer questions base on critical thinking skill regarding environmental issues.
5. Teacher collected the scripts, explained further on how to answer difficult areas in the questions and marked student’s scripts.
6. Teacher gave out assignments to the participants on environmental issues.
7. Lastly, researcher revised the training process of Critical Thinking to the students and later administered the instrument for post-test. The Control Group The participants were taught the same topics for the same duration as the experimental group by the researcher but did not receive the Critical Thinking treatment. In addition, normal weekly class tests were conducted and in the sixth week, post tests were administered.

**RESULTS**

To answer the research question, the researcher’s utilized means, while Kolmogorov Smirnov Z- test and t- test of independent samples was used to test the hypotheses at  $\alpha$  0.05 of significance using SPSS (22).

**Test of Hypothesis**

Ho<sub>1</sub> There is no significant mean difference in developing critical thinking skills for students taught by Monro and Slater strategy and those taught by lecture method.

**Table 3:** Z test of Students’ Posttest mean Scores of the experimental and control groups. There is no significant mean difference in developing critical thinking skills for students taught by Monro and Slater strategy and those taught by lecture method.

GROUP	NO.	MEAN	SD	DF	Z test	p - value
EXPERIMENTAL	34	52	6.2	83	0.865	0.045*
CONTROL	51	34	2.26			

Significant;  $p < 0.05$ .

Table 4 indicated that mean sores of the experimental group was 52 while that of control group was 34 and df (83). This reveals that the mean of the experimental group was greater than that of the control group in the posttest. Base on the result of hypothesis testing, Z- test was 0.865 while p- value was 0.045. This shows that the p- value was less than 0.05 level of significance.

Therefore, the researcher fail to accept the null hypothesis. So, there is a significant mean difference in developing critical thinking skills between students taught by Monro and Slater strategy and those taught by lecture method.

Ho<sub>2</sub> there is no significant mean gender difference in developing critical thinking skills for students taught by Monro and Slater strategy.

**Table 4:** Summary of t- test Analysis of Male and Female Students development. There is no significant mean gender difference in developing critical thinking skills for students taught by Monro and Slater strategy.

GROUP	No	Mean	DF	T TEST	P VALUE
Male	24	56	33	0.123	0.062*
Female	10	51			

Significant;  $p > 0.05$ .

Table 5 reveals that the mean score difference was 5 in favour of the male students. On the other hand t- test value 0.123, df (33) and p- value 0.062. The null hypothesis was accepted because the p- value was greater than 0.05 level of significance. So, there is no significant mean score difference between male and female students taught by Monro and Slater Strategy

## DISCUSSION

The purpose of this study is to investigate the influence of Developing Critical Thinking Skills in geography among Secondary Students in Plateau State by Utilizing Monro and Slater Strategy. The findings of the research revealed that there is a significant mean score difference between the experimental and control group in favour of the experimental group that received treatment through monro and slater strategy. This corroborate the findings of (Rongie, 2019, Elisab, Gunarhadi and Riyadi 2018, Taghva, Narges, Javad, and Roghaye, 2014 and Alnabulsy, 1995). That critical thinking development improved students' academic achievement when an appropriate teaching methods was applied, particularly a teaching strategy that is learner centered like Monro and Slater Strategy that allow the learner to differentiate between his opinion and facts on the ability to analyze, induce, deduct, conclude and to evaluate geographical issues critically. In addition, this study reveals that Monro and Slater Strategy was gender friendly. Result of the t test indicated that there is no significant mean difference between male and female students achievement when expose to the treatment. This is in line with the findings of (Asuai, 2013, Taghva, Narges, Javad, Roghaye, 2014, and Bagheri, and Afsaneh 2016) respectively. This contradict the finding of Arslan, (2012), who discovered that there is a significant gender difference between male and female students in environmental education.

## RECOMMENDATION

By implication from the findings of the study, the researcher recommended that teachers should emphasis on teaching methods that involve that construct of the learner to be able to apply their critical thinking skill in providing solutions to geographic issues. Doing so, will improve the

academic achievement of the learner to greater height. Also, teachers should always think critically in presenting topical issues to the learner that will allow the learner to be able to make adequate analysis, induction, deduction, conclusion and evaluation not only in the class but in real life application at large.

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