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The Effectiveness Of Using Hausa Socio Cultural Environment Strategy On Teaching Practical And Descriptive Geometry In Primary Schools In Kunchi And Tsanyawa Local Government Area Of Kano State- Nigeria

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Abstract: ***This set to investigate the effectiveness of using Hausa Socio Cultural Environment strategy in teaching practical and descriptive geometry to primary III pupils in Kunchi and Tsanyawa local government area of Kano state-Nigeria. The study adopted Quasi experimental design using pre-test posttest. One hundred and three (103) primary schools with a total of nine thousand seven hundred and twenty one (9,721) primary III pupils served as the population of the study. Four primary schools (two from each local government area) and one hundred sixty nine (169) pupils with 88 pupils as experimental group and 81 pupils as control group as the sample of the study. Guttmen split-half method was used to estimate the reliability of the instrument developed by the researchers and obtained to be 0.61.two hypotheses were formulated and tested at $\alpha = 0.05$ level of significance. Student t-test statistic for independent variables was used for data analysis. The results of the study indicated that there was significant difference in the mean scores of experimental group over the control group at $\alpha = 0.05$ level of significance. It was also found that a significance difference exists in the mean scores of male and female pupils who were taught practical and descriptive geometry using Hausa socio cultural environment strategy in favor of male pupils. Based on the results of this study, some recommendations were made these include Mathematical Association of Nigeria (MAN) and Science Teachers Association of Nigeria (STAN) should conduct workshop about the use of socio cultural environment strategy in teaching practical and descriptive geometry in particular and mathematics in general.***

I. INTRODUCTION

Mathematics is one of the most important subjects offered in schools right from pre-primary to secondary school level. It is in recognition of this the National Policy on Education in Nigeria accorded a position of core status (FME, 2004). It any nation that needs to developed scientifically, technologically and socially and otherwise, the teaching and learning of mathematics should be given due consideration. Agwagah (2005) observes that most fundamental reason why we place so much emphasis on mathematics is its usefulness.

Despite the roles mathematics plays in national development its teaching and learning is at declined. This is clearly displayed in students' performance in both external and internal examinations (Kajuru and Kauru, 2010). Many reasons were attributed this poor state of students' performance in mathematics among which include poor students' study habit, poor teaching method, poor teaching and learning environment, administrators and parents related problem and so on Muhammad (2012). There has been an increased in the awareness by those concerned with mathematics education that the traditional lecture method of teaching mathematics has not been very successful Chainon et al (2011) in Kajuru and Isah (2014). There is need for teachers of mathematics to device different methods of teaching the subject right from primary school level.

The disparity in the male and female performance in mathematics is another area of interest to those concerned with mathematics educator world over. All hands are being on desk to bridge the gap, yet there exists difference in the mathematic performance of girls and boys students Muhammad (2012) and Asante (2010). There is need therefore, to continue with investigating the mathematics performance of male and female students.

The foundation for children's mathematical development is established in the earliest years. Mathematics learning builds on the curiosity and enthusiasm of the children and grows naturally from their experiences. Mathematics at this stage, is appropriately connected to a child's world, is more than "getting ready" for school to accelerate them into elementary arithmetic. The schools could play this important role through competent mathematics teachers who are able to device appropriate methods for teaching the subject. The appropriate methods employ by the teachers help children acquire the needed mathematical experience on which subsequent education levels depends (Khadijah, 2006).

Pupils need to have sound understanding of mathematics right from the grass root. Odobo (2011) opines that the difficulty students have in learning mathematics is displayed in their poor achievement at various examinations in both internal and external examination from primary schools to institutions of higher learning. This poor performance or achievement portray clearly that pupils have problems in learning mathematics. One of these problems is the way mathematics teachers present mathematical concepts to pupils without consideration to the child's environment or social background (Obodo, 2011)

Experience a child has before coming to school of this nature would be good starting point for the mathematics teacher. The concept of practical and descriptive geometry could be properly taught to pupils at any community using their home experience of the shapes. It is agreed that each community has its social and cultural practices that can be related to these shapes in one or the other. Mathematics teachers can make their lessons child centered by applying different methods to teach the concept of practical and descriptive geometry at early level of primary schools. The child's immediate physical environment and some activities that are common among the child's community can be of great help.

The child's environment refers to his socio-cultural environment. The term culture could be viewed from different angle, Microsoft Encaetta2009 viewed culture as shared beliefs and values of group (the beliefs, customs, practices, and social behavior of a particular nation or people). It further defined culture as people with shared beliefs and practices **(**a group of people whose shared beliefs and practices identify the particular place, class, or time to which they belong). However, culture can be defined as ways and manner particular group of people behaves.

II. STATEMENT OF THE PROBLEM

Sound understanding primary mathematics serves a Primary school environment serves as a foundation for the solid or weak mathematical experience and affect pupils' attitude towards mathematics for the rest of their lives (Ahmad, 2001). This means if a child is able to have good understanding of the basic mathematics concepts right from primary school, it goes the same with subsequent educational levels. To buttress this fact, Muhammad (2010) observes that the current primary and secondary school mathematics curricular is spiral in nature. This is to say that understanding of Primary Two (PS II) mathematics depends on how appropriate a child understood the Primary One (PS I) mathematics and it goes in this order.

There is need therefore, for the primary school mathematics teachers to device simple and appropriate methods that are learners' environment centered in teaching their pupils. These methods require the presentation of mathematical concepts to children through socio cultural approaches and certainly child friendly. Aikehead and Jegede (2002) opined that cultural processes within the child's immediate environment are effective means in the acquisition of science culture. They further observed that the importance of harmonizing the culture of science to that of students' environment in order to support the students' view of the world and help in enculturation should be emphasized.

III. PURPOSE OF THE STUDY

The main purpose for this study is to assess the effectiveness of "Hausa Socio-Cultural Environment Strategy" (HSCES) in teaching practical and descriptive geometry to primary school pupils. Furthermore, the study investigated whether the method is gender friendly.

IV. RESEARCH QUESTIONS

The following research questions are put forwards to guide the study.

- ✓ What is the effectiveness of using Hausa Socio-Cultural Environment Strategy (HSCES) in teaching practical and descriptive geometry to primary school pupils?
- ✓ Does the Hausa Socio-Cultural Environment strategy gender friendly?

V. RESEARCH HYPOTHESES

The following null hypotheses are stated for testing at 0.05 level of significant.

- ✓ $H_{O1:}$ There is no significant difference between the performance of pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy and those taught using conventional lecture method.
- ✓ $H_{O2:}$ There is no significant difference in the performance of male and female pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy.

VI. METHODOLOGY

The design of the study was quasi experimental design adopting pretest, posttest group. Qausi-Experiment design is partly but not fully true experimental design, it controls some but not all of the sources of internal validity. It involves selecting group upon the variable is tested without any random pre-selecting process (Shuttleworth, 2008). Intact classes were used in all the schools as the nature of the school setting may not allow for treatment to be given to some and withheld from others. Pretest, posttest was given to both Experimental and Control groups. The pretest was administered to both groups to ascertain the homogeneity in terms of their performance in practical and descriptive geometry. The Experimental group was taught Practical and Descriptive Geometry (Three Dimensional Shapes) using Hausa Socio Cultural Environment Strategy (HSCES) and the control group were taught the same concept using lecture method. the schools from Kunchi local government area were Rigana and Bumai primary schools while from Tsanyawa local government area were Daddauda and Y'an-awaki primary schools. The four schools were grouped into Experimental and Control groups.

Four mathematics teachers of the same qualification and relatively the same teaching experience were selected from the list of primary schools mathematics teachers in the area (one teacher from each school). The experimental group teacher were trained for one week on how use HSCES and the control on lecture method.

A. POPULATION OF THE STUDY

The study area consists of one hundred and three (103) public primary schools from Kunchi and Tsanyawa local government area of Kano state, Nigeria**.** The primary schools have a total of nine thousand seven hundred and twenty one primary III pupils. The average age of the population was 9 years.

B. SAMPLE AND SAMPLING TECHNIQUE

Out of 103 primary schools in the population, four primary schools were randomly selected namely: Rigana 41 pupils (27 male, 14 female), Bumai 38 pupils (23 male, 15 female) from Kunchi local government area and Daddauda 47 pupils (31 male, 16 female) and Y'an-awaki 43 pupils (25 male, 18 female) from Tsanyawa local government area. Two schools (one from each local government area) were tagged Experimental Rigana and Daddauda while contrl-Bumai and Y'an-awaki.

C. INSTRUMENTATION

One instrument was developed by the researchers which was used and collected data for the study. The instrument was Practical and Descriptive Geometry Test (PDGT). The PDGT consists of twenty (20) items multiple choice objective tests. The questions were based on knowledge, comprehension and application. The test items were taken to experts in mathematics education and measurement and evaluation departments respectively in Federal College of Education (Technical), Bichi for face and contents validity. Their observations were incorporated in modifying the final copy of the instrument for data collection.

The reliability of the instrument was obtained by Guttmen Split-half method. Pilot study was carried out in Y'andadi primary school and the result obtained was 0.61. Hence, the reliability of the instrument is within the acceptable range.

D. PROCEDURE FOR INSTRUMENT ADMINISTRATION

The teachers in the Experimental group were assigned to guide the pupils in the experimental group using HSCES while the teachers in control group guided the pupils in the control group using lecture method for weeks. At the end of the two weeks exercise, the data collection instrument-PDGT was administered to both experimental and control groups to access the pupils performance.

E. STATISTICAL INSTRUMENT

The data in this study was analyzed using Student t-test statistic for two independent samples.

VII. RESULTS

$H_{O1:}$ There is no significant difference between the performance of pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy and those taught using conventional lecture method.

Group	N	Mean	SD	Df	t-cal	t-crit	Significance
Experimental	88	48.422	12.798	167	3.214	1.960 sigf	
Control	81	41.163	12.808				

Table 1.0: Post-test Summary of t-test analysis of Experimental and Control groups

The results of table1.0 showed that at 0.05 probability value the Tcal=3.214 > Tcrit. =1.960, this shows that there is significant difference in the mean scores of pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment strategy and pupils taught using lecture method. The null hypothesis of no significance difference in mean scores of pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment strategy and pupils taught using lecture method is therefore rejected. .

$H_{O2:}$ There is no significant difference in the performance of male and female pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy.

Sex	N	Mean	SD	Df	t-cal	t-crit	Significance
Male	48	51.793	12.659	86	2.136	1.960 sigf	
Female	40	43.767	11.947				

Table 2.0: Post-test Summary of t-test analysis of Experimental group Base on Gender

The results of table 2.0 showed that at 0.05 probability value the Tcal=2.136 > Tcrit. =1.960, this shows that there is significant difference in the mean scores of male and female pupils taught practical and descriptive geometry using Hausa

Socio-Cultural Environment strategy. The null hypothesis of no significant difference in the performance of male and female pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy is rejected.

VIII. DISCUSSION

The study assessed the effectiveness of using Hausa Socio -cultural environment strategy in teaching practical and descriptive geometry to lower primary classes. The results of table 1.0 revealed that pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment strategy performed better than the control group taught using lecture method. This was proved by the mean scores of experimental group which is 48.422 while that of control group as 41.163 which has the mean difference of 7.259. Hence, the null hypothesis of no significant difference in the mean the performance of pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy and those taught using conventional lecture method is rejected.

The result of this study has agreed with the earlier findings of Adipo (20215) and Muhammad (2012) both found that the use of concrete materials by teacher in teaching mathematic improves pupils' performance. Also Aikehead and Jegede (2002) opinioned that cultural processes within the child's immediate environment are effective means in the acquisition of science culture.

The results of table 2.0 revealed that male pupils performed better than the female counterpart whom were taught practical and descriptive geometry using Hausa Socio-Cultural Environment strategy. This was confirmed by the mean scores of male pupils which is 51.793 while that of female pupils as 43.767 which has the mean difference of 8.026. Hence, the null hypothesis of no significant difference in the mean score of male and female pupils taught practical and descriptive geometry using Hausa Socio-Cultural Environment Strategy is rejected.

The result of this study confirmed the earlier finding of Muhammad (2012) and Asante (2010) found a significant difference in the mathematics performance of boys and girls in favor of boys. However, this result has slightly differs from the findings of Ganley and Lubiensk (2016) who found small (insignificant) difference in mathematics performance of boys and girls.

IX. RECOMMENDATIONS

- ✓ Based on the results of this study, some recommendations were made these include Mathematical Association of Nigeria (MAN), Science Teachers Association of Nigeria (STAN), education authorities at state and local government level should conduct workshop about the use of socio cultural environment strategy in teaching practical and descriptive geometry in particular and mathematics in general. Teachers and parents should encourage girls pupils to study mathematics and compete with the male counterparts right from lower level of primary schools.

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