EFFECT OF HYPERTEXT PREPROCESSOR (PHP) COMPUTER PACKAGE ON GEOMETRY ACHIEVEMENT OF SENIOR SECONDARY SCHOOL STUDENTS' IN KONTAGORA, NIGER STATE

Gimba, R. W.
Department of Science Education
Federal University of Technology
Minna, Niger State

Abstract

Mathematics; the queen of science has been regarded as an abstract system built on abstract element. This is the notion many students hold for geometrical shapes. Computer Assisted Instruction (CAI) like PHP (Hypertext Preprocessor) application was thought of by the researcher as a medium to ease students' difficulty in geometrical shapes. The study used the pretest- posttest design. Simple random sampling Technique was used to select 40 (20 Male and 20 Female) students. The Experimental Group was taught the geometrical shapes using the PHP CAI package and the Control Group was taught the same concept using the conventional method. Two research questions and two hypotheses were formulated and tested at 0.05 level of significance. Geometry Achievement Test (GAT) was administered to the students as pre-test and post-test and the data collected were analyze using Mean, Standard Deviation and t-test with the aid of SPSS statistics. The findings revealed that there was a significant difference between the performance of students taught with PHP CAI package and those taught with conventional method and there was no significant difference in the performance of male and female students taught with PHP CAI package. Some recommendations were made among which is that the federal authority should come to the aid of education by providing computers system in secondary schools to make the teaching and learning more interesting.

Introduction

Mathematics is the backbone of all scientific and technological investigations and all activities of human developments. It is only the language and culture common to all studies (Harbor – Peter, 2000; Uzo, 2002). The study of Mathematics is a basic preparation for citizenry and a gateway into a numerous career choice in life (Obodo, 2002). Mathematical knowledge has much to offer in solving problem of mankind in everyday living. Soyemi (2003) pointed out that everybody solves and uses Mathematics in one way or the other. The importance and the usefulness of

mathematics in the National – building and everyday cannot be over – emphasized. Our country Nigeria, realizing this fact made mathematics one of the core subjects in primary and secondary schools. However students' performance in this subject in public examination over the years has remained poor.

Mathematics is indispensable for a successful living in the modern science world, yet it is disheartening to notice that mathematics is considered to be a very difficult subject by the majority of students. Discussion with colleagues and students have always prompted one to probe deeper into problems in mathematics particularly geometrical shapes like cube, cuboids, sphere, cylinder, frustum, cone to mention few. Learning and understanding of some topics in mathematics have not only been frustrated by the nature of the topic but by clumsy method and instructional materials used (Etukudo, 2002). Harbor – Peter, (2000) identified some factors that influenced effective learning outcome as mode of task presentation, nature of the topic and types of instructional material used. Shaibu and Usman (2000) stressed that involvement of students in the teaching and learning process which means a departure from the tradition method of teaching is another means of ensuring active learning of mathematics.

The performance of students in mathematics has been quite unsatisfactory over the years in Niger state particularly in geometry the researcher came to conclusion that something is wrong with the system by which the learners received the concept of geometry in mathematics. The use of PHP CAI package could be a solution to the poor performance of secondary school students in geometry. The WAEC Chief Examiners reports also revealed that students are generally weak in the area of geometry. The Niger state Ministry of education gave a summary of students' performance in mathematics 2001 – 20007 in WAEC examination, about 74% of the students failed, 12% pass while 3% credit pass. In view of the above results, Computer Assisted Instruction (CAI) could be a solution to geometrical problems in order to improve secondary school students' achievement in geometry.

Yahaya (2008) defined computer as a machine that can accept data, process data and give output as information. Recently the use of computer in the process of teaching and learning has become widespread in educational institutions with the development of micro computer. In this age of computer, where the world is seemed as a global village, we need computers in our secondary school for teaching and learning of mathematics. The present era being called "the computer age" PHP (Hypertext Preprocessor Programme) could be use to teach geometric shapes where the dimensions can be viewed and students can rotate the shapes in any angle with beautiful colours and slide appearance. This will help students to reduce the abstractness and motivates students by enhancing better understanding of geometry.

PHP is a server-side scripting language, it scripts are executed on the server. PHP is a high level programming language which is easy to learn. The codes look a lot like English language with special effects and feature. PHP runs on different platforms (Windows, Linux, UNIX, etc.) and is free to download and use.

Study conducted by Ahmadu and Raji (2004) revealed that students teacher show positive attitude toward learning computer studies. Tabassum (2004) equally confirms improvement in both the performance and attitude of learner toward mathematics with the use of CAI package. Etukudo (2002) revealed that there was no significant gender difference in the performance of secondary school students taught mathematics with the help of computer. Adegbenro (2006) also found out the gender does not influence students' achievement in mathematics when using models to teach students. Contrary to this, James (2001) ascertained in his study that the female students perform better with the use of enquiry method than their male counterpart. However, there is no conclusive research on genders. Therefore, the researcher sees the importance of gender as a variable to be examined in this study.

Purpose of the Study

The purpose of this study is to find out the effects of PHP computer package on geometry achievement of senior secondary school students. The study aimed at determines the difference in the mean performance of;

i.   Students taught geometrical shapes using the CAI package and those taught same geometrical shapes using the conventional method.
ii.   Male and female students taught geometrical shapes using PHP CAI package.

Research Questions

The following Research Questions were raised in the study;

i.   What is the difference in the mean achievement score of students taught geometrical shapes using PHP CAI package and those taught same geometrical shapes using the conventional method?
ii.   What is the difference in the mean achievement score of male and female students taught geometrical shapes using PHP CAI package?

Research Hypotheses

HO_1:   There is no significant difference in the mean achievement score of students taught geometrical shapes with PHP CAI package and those taught with conventional method.

HO_2:   There is no significant difference in the mean achievement scores of male and female Students' taught geometrical shapes using PHP CAI package.

Significance of the Study

The use of PHP CAI package in the classroom will encourage students and mathematics teachers to appreciate and make effective use of computer in teaching and learning of mathematics. The findings from this research is hoped to assist the mathematics curriculum developers to include use of computer Assisted Instructions (CAI) package in the planning and also to ensure that mathematics teachers abide by it.

It is also believed that the research findings would help Niger state Ministry of Education secondary schools, Education Board, and other educational stakeholders in secondary schools to plan and implement policies which ensure implementation of the uses of instructional packages for teaching mathematics, so that mathematics can be thought and learn effectively and efficiently.

Methodology
Research Design

The pretest-posttest design was used for this research work. The pretest was administered to both the experimental and control groups. The experimental group received treatment using Hypertext preprocessor (PHP) CAI package while the control group was taught using the traditional method.

Sample and Sampling Method

The population for this study was made up of two thousand five hundred and fifty (2,550) from Six (6) senior secondary schools (SS11) in Kontagora. Purposive sampling technique was used to select two secondary schools that are well equipped with computers. Twenty (20) students were randomly selected from each of the schools given a total of 40 students using simple random sampling technique. Twenty (20) students each were randomly assigned to experimental and control groups.

Research Instruments

Geometry Achievement Test (GAT) consists of 20 multiple choice items with four options (A-D). The instrument was designed by the researcher using table of specification. The instrument was administered to the students as pre-test and post test. The instrument (GAT) and the package were subjected to face and content validity. The reliability of the instrument was determined using test-retest method. The reliability coefficient of $r = 0.86$ was obtained.

Method of Data Analysis

The experimental group was taught geometrical shapes using PHP (Hypertext Preprocessor Progamme) CAI package while Control group was taught using traditional teaching method at the end the two groups were subjected to post-test. The scores from both groups were computed and used for the data analysis. The data collected were analyzed using Mean, Standard Deviation and t – test statistics to test for the hypotheses formulated at 0.05 level of significance using Statistical Package for Social Sciences (SPSS).

Results

HO_1: There is no significant difference between the Mean scores of the students taught geometrical shapes with PHP (Hypertext Preprocessor) Package and those taught geometrical shapes with Conventional method.

Table 1: t-test Analysis of the Post-test Mean Score of the Experimental and Control Groups

Variable	N	df	$\overline{X}$	SD	t – Cal	Significant (2-tailed)	Remark
Experimental Group	20		89.50	9.13			
		38			2.449	0.019	S*
Control Group	20		67.50	8.74			

S = Significant at P < 0.05

The table 1 revealed that there is a significant difference in the mean score between the Experimental and Control group. This indicated that the Experimental group performed better than the Control group due to exposition to the use of PHP CAI package, the experimental group has mean and standard deviation of 89.50 ± 9.13 while the control group had mean and standard deviation of 67.50 ± 8.73. Thus the hypothesis was rejected because there was a significant difference between the achievement of the experimental and the control groups as the calculated t-test (2.449) lie out of the range of the table value of t-test (0.019) that is P < 0.05.

HO_2: There is no significant difference between the Mathematics performance of Male and Female students taught with PHP (Hypertext Preprocessor).

Table 2: t-test of the Post-test Mean Scores of Male and Female Students taught using PHP CAI Package

Variable	N	df	$\overline{X}$	SD	t - Cal	Significant (2-tailed)	Remark
Male	10		90.00	10.54			
		18			0.154	0.879	NS
Female	10		87.00	9.42			

Ns = not significant at P>0.05 level of significant.

The table 2 revealed that there is no significant difference in the mean score between Male and Female students taught using PHP CAI package. This indicated that the use of PHP (Hypertext Preprocessor) is gender friendly. The male students had mean and standard deviation of 90.00 ± 10.54 while the control group had mean and standard deviation of 87.50 ± 9.42. Thus the hypothesis was not rejected because there was no significant difference between the achievement of the male and the female as the calculated t-test (0.154) lie out of the range of the table value of t-test (0.0879) that is P > 0.05.

Discussion of Result

The main aimed of this study was to investigate the Effect of PHP CAI Package on Senior Secondary Schools Students Achievement in Geometry. Two hypotheses were formulated based on the research questions. The data collected were analyzed using mean, standard deviation and t-test statistics was used to test the hypotheses at 0.05 level of significance.

The result in table 1 indicated that there was a significant difference in the posttest achievement of the students taught geometrical shapes with PHP (Hypertext Preprocessor) CAI package and those taught without it. Therefore, hypothesis one was rejected. The students taught using PHP (Hypertext Preprocessor) CAI package performed better than the students taught using conventional method. The result from this study agreed with Rapudi (2004) who noted that the Computer Aided Instruction (CAI) motivates the learners to learn than the ordinary conventional method.

The result in table 2 revealed that there was no significant difference between achievement scores of male and female students taught geometrical shapes using PHP (Hypertext Preprocessor) CAI package. Therefore hypothesis two was not rejected. The finding is in agreement with the findings of Abolade (2006) and Yusuf (2006) who affirmed that there was no significance difference in the achievement of Boys and Girls when taught History, Physics and Mathematics with computer. This result also

corroborated by the finding of Gambari (2004) who found out that computer assisted instruction is user friendly and enhances learning in students.

Conclusion and Recommendations

The use of Hypertext Preprocessor Computer Assisted Instruction (PHP CAI) Package enhanced senior secondary school students' achievement in geometry. Based on these the following recommendations were made.

i.   Mathematics teachers should embark on the use of computer for teaching and learning in senior secondary schools.

ii.   The Federal Authority should come to the aid of Education by providing computer systems in senior secondary schools; this will make teaching and learning more interesting.

iii.   The non-governmental organizations, community, individuals, groups, schools, state and federal governments should ensure that workshops and seminars are organized often on how to design, produce and utilize the Computer Assisted Instructional Packages like PHP (Hypertext Preprocessor) CAI package and other related packages by the instructors.

iv.   Professionals, association and research centers, such as Science Teachers Association of Nigeria (STAN), Mathematics Association of Nigeria (MAN), National Mathematics Center (NMC) and the Nigeria Education Research and Development Council (NERDC) should incorporate the use of Computer Assisted Instructional (CAI) packages in mathematics and sciences curriculum at secondary school level.

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