

GeoGebra software and achievement in Mathematics of High School students of Raipur District

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Abstract:

The purpose of the Research is to examine the use of GeoGebra software on the students to clarify their concepts and develop better pedagogy to teach geometry at high school level. This will help them to visualize the geometry shapes with little effort using technology. It will increase their knowledge on geometry and pedagogy of Geometry to apply to their teaching.

The present study has generated some interesting findings concerning the benefit of using GeoGebra Software for teaching Mathematics topic as compared to the traditional method of teaching. Results indicated that GeoGebra Software based teaching significantly improved student's performance on the achievement test. However, there were significant differences in student's achievement when the students who were taught using GeoGebra Software compared to those taught using traditional methods. GeoGebra Software based teaching seems to be very effective in enhancing student's conceptual understanding.

Keywords: GeoGebra Software, Achievement, ICT and High School Students

Introduction:

The purpose of the Research Proposal is to examine the use of GeoGebra software on the students to clarify their concepts and develop better pedagogy to teach geometry at high school level. This will help them to visualize the geometry shapes with little effort using technology. It will increase their knowledge on geometry and pedagogy of Geometry to apply to their teaching in elementary schools.

From surveys conducted by various institutes such as National Achievement Survey, State Achievement survey, Parham, shows that the understanding of mathematics in our school children are very poor. Through my Research Proposal I want to address the one very important area of mathematics i.e. Geometry at High School. Initially I will work with Class 9th.

The main objective of the study are to compare mean scores of conceptual understanding in Mathematics at pre and post stages of group taught through GeoGebra Software, to compare mean scores of conceptual understanding in Mathematics at pre and post stages of Male and Female students taught through GeoGebra Software.

Need and Importance of the Study:

Programs in teacher education and professional development must continually update practitioners' knowledge of technology and its classroom applications. Such programs should include the development of mathematics lessons that take advantage of technology-rich environments and the integration of technology in day-to-day instruction, instilling an appreciation for the power of technological tools and their potential impact on students' learning and use of mathematics. All teachers must remain open to learning new technologies, implementing them effectively in a coherent and balanced instructional program. These tools, including those used specifically for teaching and learning mathematics, not only complement mathematics teaching and learning but also prepare all students for their future lives, which technology will influence every day.

Conceptual and Operational Definitions:

GeoGebra Software:

GeoGebra Software is a transformative tool in mathematics, it allows learners to visualize and manipulate. It is an open source application with a very active developer community. GeoGebra Software empowers teachers and learners of mathematics.

Achievement:

Achievement is a measure of knowledge gained by Plan Programme, effort or skill which gives satisfaction.

ICT (Information and Communication Technology):

ICT is defined as the term used to describe the tools and processes to access, retrieve, store, organize, manipulate, produce and/or exchange information by electronic and automatic means. These include hardware, software and telecommunication in the form of personal computer, scanners, digital canvass, C.D. and D.V.D. players and program like data base system and multi-media applications.

Objective of the Study:

1. To compare mean scores of conceptual understanding in Mathematics at pre and post stages of Male and Female students taught through GeoGebra Software.

Hypothesis of the Study:

H₀₁ - There is no significant difference in mean scores of conceptual understanding in Mathematics at pre and post stages of Male and Female students on selected concepts using GeoGebra Software.

Delimitation of the Study:

The Present Study conducted on two classrooms of a Government High School Khorpa, Raipur District.

Population:

The term, Population “ is used in research to describe any group of individuals, events or observations in which the researcher is interested. In the present study, the term population refers to class IX students of Government School of Chhattisgarh.

Sample:

In the present investigation Government High School Khorpa, Raipur district of Chhattisgarh was the field of study. The sample of the study comprised 50 pupils each studying in Government High School Khorpa, Four sections of the IX class.

Tools:

The researcher had used Achievement Test for the study.

Administration of the Test:**Administration of the Pre-test**

Before the start of the experiment, the sample subjects were contacted and rapport was established with them. They were oriented about the tests to be used. Pre-test on Achievement Test were administered to the students of two groups by the researcher himself. Cooperation of the class teacher was sought for administering the tests properly. The instructions pertaining to the tests were explained verbally in clear terms to the students before administering the test.

The administration of the tests was carried out as per norms and instructions contained in respective test manuals.

Administration of Post-test

Immediately after the instructional treatment was over, the researcher tested the subjects of experimental group and control group on the dependent variables i.e. Academic Achievement.

Data categorization:

The various categories of data are presented in following tables and figures.

Number of Students			
		Value Label	N
Control Group	0	MALE	46
	1	FEMALE	54
Experimental Group	0	MALE	48
	1	FEMALE	52
Total			200

Table: 1.1

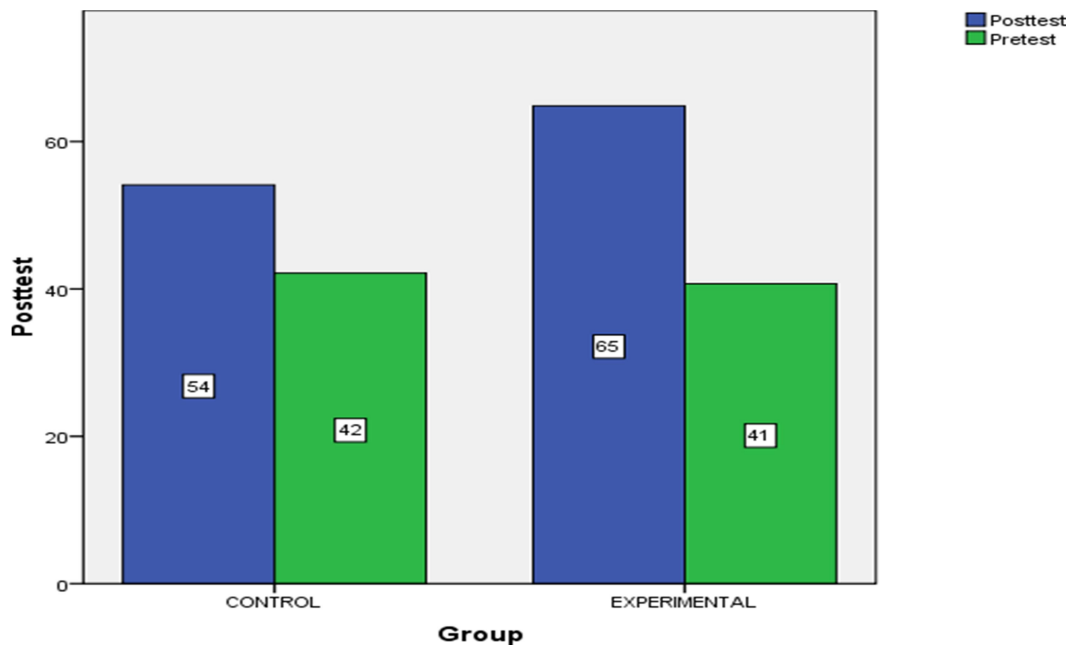


Fig: 1.1 Group wise pre-test post-test mean achievements

Analysis and Interpretation of the Data:

The hypothesis constructed is based on the variables. To test the significance of H_{01} hypothesis t-test is performed using SPSS software and the result is analyzed.

Test	Gender	N	Mean	SD	SEM	Df	t-values
Pre-test	Male	46	20.67	4.54	.734	158	0.96
	Female	54	19.96	4.72	.733		
Post-test	Male	48	25.50	5.11	.813	158	1.26
	Female	52	24.48	5.16	.813		

TABLE: 1.2 Gender-wise and Test-wise Mean, SD, SEM and t-values for Pre-test and Post-test of Conceptual Understanding.

Hypothesis:

H₀₁ : There is no significant difference in mean scores of conceptual understanding in Mathematics at pre and post stages of Male and Female students on selected concepts using GeoGebra Software.

Analysis:

From Table 1.2, reveals that the mean of Conceptual Understanding in Mathematics of pre-test of male and female are 20.67 and 19.96, respectively. Whereas, the mean of Conceptual Understanding in Mathematics of post-test of male and female are 25.50 and 24.48, respectively. The t-values of pre-test and post is 0.96 and 1.26, respectively. These values are not significant at 0.05 level with df equal to 158. Therefore, the null hypothesis, namely, “there is no significant difference in mean scores of conceptual understanding in Mathematics at pre and post stages of male and female students on selected concepts using GeoGebra Software”, is not rejected. Therefore, it can be inferred that gender had no effect on the Conceptual Understanding in mathematics of the students while teaching with GeoGebra. The software was effective in enhancing Conceptual Understanding in mathematics irrespective of gender of the students.

Findings:

Further, table 1.2 shows that the mean scores of pre-test and post-test of Conceptual Understanding in mathematics of male are 20.67 and 25.50, respectively. It shows that there was an increase in the post-test score of mean of male. While table 1.2 also shows that the mean scores of pre-test and post-test of Conceptual Understanding in mathematics of female are 19.96 and 24.48, respectively. It shows that there was an increase in the post-test score of mean of female. There were also variations in SD of males and females on both the measures. Therefore, it can be said that GeoGebra software was equally effective in enhancing the Conceptual Understanding in mathematics of both males and females.

There is no significant difference in mean scores of conceptual understanding in Mathematics at pre and post stages of rural and urban school students on selected concepts using GeoGebra Software.

Conclusion:

The study provides potential inputs for teacher education. Given the current widespread use of ICT at all levels and for all subjects, it is imperative that pre-service teachers should learn the new technology. Besides pre-service training of teachers in the making, in-service training may also be given to the existing teachers to refurbish their acumen for teaching that is teaching effectively and meaningfully.

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