

**EFFECTIVENESS OF GEOGEBRA ON STUDENTS' ACHIEVEMENT IN
GEOMETRY**

**A
THESIS
BY
NIRAJAN SHRESTHA**

**IN THE PARTIAL FULFILLMENT OF REQUIREMENT FOR THE DEGREE
OF MASTERS OF EDUCATION IN MATHEMATICS EDUCATION**

SUBMITTED TO

DEPARTMENT OF MATHEMATICS EDUCATION

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त्रिभुवनविश्वविद्यालय
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Letter of Certification

This is certify that **Mr. Nirajan Shrestha**, a student of academic year **2072/73** with Campus Roll Number **341**, Thesis Number **1515**, Exam Roll Number **7228339** and TU Registration Number **9-2-375-181-2010** has completed this thesis for the period prescribed by the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. This thesis entitled “**Effectiveness of GeoGebra on Students’ Achievement in Geometry**” has been prepared based on the results of his investigation conducting the period 2019 at the Department of Education, University Campus, Kirtipur Kathmandu. I hereby recommended and forward that his thesis be submitted for the evaluation as the partial requirements to award the degree of Master of Education.

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Letter of Approval

This thesis entitled “**Effectiveness of GeoGebra on Students’ Achievement in Geometry**” submitted by **Mr. Nirajan Shrestha** in partial fulfillment of the requirements for the Master's Degree in Education has been approved.

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Recommendation for Acceptance

This is to certify that **Mr. Nirajan Shrestha** has completed his M.Ed. thesis entitled “**Effectiveness of GeoGebra on Students’ Achievement in Geometry**” under my supervision during the period prescribed the rules and regulations of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward his thesis to the Department of Mathematics Education to organize final viva-voce.

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Prof.Dr. Binod Prasad Dhakal

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Declaration

This thesis contains no material which has been accepted for the award of other degree in any institutions. To the best of knowledge and belief this thesis contains no material previously published by any authors except due acknowledgement has been made.

.....

(Nirajan Shrestha)

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Dedication

Honestly dedicated

To

My parents

Rishi Man Shrestha and Ram Maya Shrestha

Acknowledgement

I would like to thank my supervisor Prof. Dr. Binod Prasad Dhakal for his advisory and mentoring role throughout the research journey. It would not be possible for me to bring the inquiry in this form without his quality, time, positive encouragement, invaluable advice, guidance, insight and support.

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.....

Nirajan Shrestha

Abstract

The purpose of this study was to investigate the effectiveness of GeoGebra software on students' achievement in triangle and parallelogram of geometry at grade IX. A pre-test and post-test of quasi-experimental research design was used to compare the achievement of two groups i.e. experimental and control. The researcher chooses 30 students of Shree Mahadev Secondary School, Belkotghadi-7, as an experimental group and 32 students of Shree Shila Devi Secondary School, Belkotghadi-6 as a control group. After the completion of the triangle and parallelogram, researcher collected data from mathematics achievement test and a set of opinionnare related to five point Likert scale. The mathematics achievement test was used for the first objective: comparing the achievement of the students taught by using GeoGebra and traditional method in triangle and parallelogram and opinionnare was used for the second objective: analyzing the students' perception on Geogebra software.

The results indicated that there was a significant difference between the average achievement score of experimental and control groups on post-test. The finding of this study illustrated that the students in the experimental group performed better when using GeoGebra than the control group with the traditional teaching method. Additionally, a set of opinionnare related to Likert scale was used to explore the student's perception on GeoGebra software. This opinionnare was administered to only experimental group. The result of opinionnare showed that, students gave positive feedback or perception about GeoGebra software in learning triangle and parallelogram at geometry.

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Abbreviations

ACE : Activities, Classroom discussion and Exercise

CDC : Curriculum Development Centre

CAS :Computer Algebra System

DGS : Dynamic Geometry Software

ICT : Information and Communication Technology

NCTM: National Council of Teacher of Mathematics

ZPD : Zone of Proximal Development