

**STUDENTS' VAN HIELE LEVEL OF GEOMETRIC THOUGHT AND ITS
RELATIONSHIP TO THEIR ACHIEVEMENT IN MATHEMATICS**

**A
THESIS**

**BY
RASHMA THAPA**

**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE IN
MATHEMATICS EDUCATION**

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STUDENTS' VAN HIELE LEVEL OF GEOMETRIC THOUGHT AND ITS RELATIONSHIP TO THEIR ACHIEVEMENT IN MATHEMATICS

RECOMMENDATION FOR ACCEPTANCE

This is to certify that **Miss. Rashma Thapa**, has completed her M.Ed. thesis entitled **Students' van Hiele Level of Geometric Thought and its Relationship to their Achievement in Mathematics** under my supervision during the period prescribed the rules and regulation of Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward her thesis to the Department of Mathematics Education to organize final viva-voce.

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(Mr. Krishna Prasad Adhikari)

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LETTER OF CERTIFICATE

This is certify that **Miss. Rashma Thapa**, a student of academic year **2070/71** with Campus Roll Number **522**, Thesis Number **1287**, Exam Roll Number **280506** and TU Registration Number **9-2-593-63-2008** has completed this thesis for the period prescribed by the rules and regulation of Tribhuvan University, Kirtipur, Kathmandu, Nepal. The thesis entitled **Students' van Hiele Level of Geometric Thought and its Relationship to their Achievement in Mathematics** has been prepared based on the results of her investigation. I, hereby, recommend and forward that her thesis be submitted for evaluation as the partial requirements to award the degree of Master of Mathematics Education.

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(Assoc. Prof. Laxmi Narayan Yadav)

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LETTER OF APPROVAL

This thesis entitled **Students' van Hiele Level of Geometric Thought and its Relationship to their Achievement in Mathematics** submitted by **Miss. Rashma Thapa** in partial fulfillment of the requirements for the Master's Degree in Education has been approved.

Viva-voce Committee

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Date:

DECLARATION

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

.....

(Rashma Thapa)

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DEDICATION

Honestly dedicated

To

my parents

Nar Bahadur Thapa and Dil Maya Thapa

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.....

(Rashma Thapa)

ABSTRACT

This is a research study has been carried out to find out van Hiele level of geometric thinking of grade X students and its relationship to their achievement in mathematics and teachers' perspectives on van Hiele level of geometric thinking. Using mixed method research design focusing on survey approach, the researcher used stratified random sampling method to select 4 secondary school and 203 students were sample of the study of Tanahun district. Four mathematics teachers of respective schools' were interviewed in detail about their view on van Hiele level of geometric thinking with respect to subject difficulty, level access, attitude toward teacher training and geometry teaching. Van Hiele geometric test (VHGT) was used as a main tool for the data collection and school examination in mathematics (SEM) was second tool. The data obtained from van Hiele Geometric Test of each student and score of students were obtained from schools' record and interview has been analyzed descriptively.

The participated students were asked to respond on 20 multiple choice questions, each question contents 5 multiple answers to test VHGT. Analysis of both qualitative and quantitative data were collected from the respondents, it has been found that, the participations were at low

van Hiele geometric thinking levels, at level 3 which is quite difficult than level 1 and 2 and absence at level 4 shows that the students had difficulty in dealing concerning class inclusion and the relationship between the properties of various simple geometric shapes and between different shapes. The teachers perspective on VHGT found that method and teaching procedure is easy in level '0', '1', and '2' than '3' and '4'. Students' VHGT scores were found to be significantly correlated with their SEM scores. This means that who did well in VHGT did just as well in the SEM.

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ABBREVIATIONS

CDASSG: Cognitive Development and Achievement in Secondary School Geometry

P.E.: Probable Error

r: Correlation

SEM: School Examination in Mathematics

TPD: Teacher Professional Development

VH: Van Hiele

VHGT: Van Hiele Geometric Test

ρ : Pearsonian Correlation Coefficient (rho)