EFFECTIVENESS OF VAN HIELE APPROACH IN GEOMETRY TEACHING AT SECONDARY LEVEL

IN PARTIAL FULFILMENT FOR THE MASTER'S DEGREE IN EDUCATION FACULTY OF EDUCATION, TRIBHUVAN UNIVERSITY KATHMANDU, NEPAL

A THESIS BY HARI PRASAD DANGAL

SUBMITTED TO THE DEPARTMENT OF MATHEMATICS EDUCATION SUKUNA MULTIPLE CAMPUS, MORANG TRIBHUVAN UNIVERSITY,

MORANG, NEPAL

2011

i

ACKNOWLEDGEMENTS

I express my heart felt gratitude to my research guide Mr. Dandapani Gautam, Department of Mathematics Education, Sukuna Multiple Campus, Indrapur, Morang for his guidance, encouragement, cooperation and valuable suggestion for planning preparation and edition of this thesis.

I would like to express thanks to Mr. Prem Tamang, Chief of Department of Mathematics Education, Sukuna Multiple Campus for his valuable encouragement, suggestion and continuous guidance during this study. I would like to express thank to my respected teacher Mr. Rajkumar Niraula and all Mathematics teachers of Department of Mathematics Education, Sukuna Multiple Campus, Indrapur, Morang.

I would like to extend my thanks to the Headteacher Mr. Khagendra Prasad Adhikari and all staffs of Shree Moti Higher Secondary School, Dharampur, Jhapa for their sincere cooperation and specially grateful to all the students for their active participation in during the collection of the data of this study.

In the preparation of this study, I have consulted several books, thesis and papers for which I am deeply indebted to the authors.

Finally, I am also grateful to all my friends as well as my parents Premlal and Chhayadevi Dangal; to my wife Gita Dangal; to my son Prajwal Dangal and to my daughter Pranika Dangal for their great love, constant support, continuous encouragement and inspiration in my study. At last I thank Mr. Yagyamani Niraula and Durga Kharel who helped me in typing my thesis on time.

Hari Prasad Dangal

ABSTRACT

We have seen that most of the students of secondary level afraid of geometry; on a result the number of students taking Mathematics getting down. Many of the studies show that the hardness of geometry can be reduced and teaching and learning can be made easier by using different kind of approaches. In this research the researcher tries to examine the effectiveness of Van-Hiele's approach in geometry teaching at secondary level. This study was an experimental in nature on the basis of design pre test-post test non equivalent groups which was conducted for grade X. There were 38 students and they were divided into non-equivalent groups with the help of pre-requisite test and also the final result of 2067. The two groups were made homogeneous as far as possible. The two groups were experimental group and control group. The experimental group was taught by using Van-Hiele's approach and control group was taught by usual method. The duration of experimental class taken was eight days. After taking experimental class, the post test of all 38 students was taken and the result of the post test was analysed by finding out mean and standard deviation and using Z-test and T-test at 0.05 level of significance and found that Van-Hiele's approach in geometry teaching seems more effective than usual method.

Date: August, 2011

TABLE OF CONTENTS

| | Page No. |
|--|----------|
| Approval letter | i |
| Recommendation letter | ii |
| Acknowledgement | iii |
| Abstract | iv . |
| Table of Content List of Table | |
| List of Figure | viii |
| Abbreviation | ix |
| Chapter-I : INTRODUCTION | |
| Background | 1 |
| Statement of Problem | 8 |
| Significance of Study | 8 |
| Objectives of the Study | 10 |
| Hypothesis of the Study | 11 |
| Delimitation and Limitation of the Study | 11 |
| Definition of the Related Terms of the Study II : REVIEW LITERATURE AND THEORETICAL | 12 |
| FRAMEWORK | 14-18 |
| Chapter-III : METHODS AND PROCEDURES | |
| Design of Study | 19 |
| Population and the Sample of the Study | 20 |
| Tools | 21 |
| Description of Test Items and Scoring Criteria | 22 |
| Reliability | 22 |
| Validity | 22 |
| Data Collection Procedure | 23 |
| Data Analysis Procedure | 24 |
| IV: ANALYSIS AND INTERPRETATION | |
| Analysis of Achievement of Experimental & Control Group | 25 |

V: SUMMARY, FINDINGS, CONCLUSION AND RECOMMENDATION

| Summary | 30 |
|---|----|
| Findings of the Study | 30 |
| Conclusion | 31 |
| Recommendation and Suggestion for Further Study | 32 |
| Suggestion for the Further Study | 33 |

BIBLIOGRAPHY

APENDICES

LIST OF TABLE

| 1. Design of the Study | 20 |
|--|----|
| 2. Analysis of Achievement of Experimental and Control Group | 26 |
| 3. Achievement of Experimental and Control Group Students | 26 |
| 4. Achievement of Experimental Group Students by Gender | 27 |
| 5. Achievement of Control Group Students by Gender | 28 |

LIST OF FIGURE

Achievement of students in post-test exam is represented on bar diagram

26

LIST OF SYMBOL

- 🗌 Parallelogram
- Δ Triangle
- || Parallel
- \perp Perpendicular
- \cong Congruent
- \overline{X} Mean

ABBREVIATIONS

| S. L. C. | - | School Leaving Certificate |
|----------|---|---------------------------------|
| NESP | - | National Education System Plan |
| VHL | - | Van-Heile Level |
| SSS | - | Side- Side- Side |
| SAS | - | Side- Angle- Side |
| RHS | - | Right Angle Hypotenuse and Side |
| ASA | - | Angle- Side- Angle |
| SP^2 | - | Pooled Sample Variance |
| | | |