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Letter of Certificate

This is to certify that Mr. Sabin Aryal, a Student of academic year 2070/071 with campus Roll No: 08, Thesis number 1277, Exam Roll No: 280512 and T.U. registration number 9-1-43-32-2006 has completed this thesis under supervision and guidance of Mr. Dipak Mainali in the period prescribed by the rules and regulations of Tribhuvan University, Nepal. The thesis entitled on **'Influence of Symbols on Basic Level Students' in Solving Algebraic Problems'** has been Prepared based on the result of his investigation conducted during the Period 2017 under the Department of Mathematics Education, Central Department of Education, University Campus, Tribhuvan University, Kirtipur, Kathmandu, Nepal. I recommend and forward that this thesis submitted for the evaluation to award the degree of Masters of Education. (In Mathematics Education)

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Letter of Approval

This thesis entitled **Influence of Symbols on Basic Level Students' in Solving Algebraic Problems** submitted by Mr. Sabin Aryal in Partial Fulfillment of the Requirement for the Master's Degree in Mathematics Education has been approved.

Viva Voce Committee	**Signature**
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Recommendation for Acceptance

This is to certify that Mr. Sabin Aryal has completed his M.Ed. thesis entitled **'Influence of Symbols on Basic Level Students' in Solving Algebraic Problem'** under my supervision during the period prescribed by 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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Declaration

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

……

Date: 9th Nov., 2017 (Sabin Aryal)

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Dedication

This work is affectionately dedicated to my Father Jib Prasad Aryal

and mother Ambika Aryal who even in a very difficult

situation, gave me a great span of their

life for what I am now.

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…….

Sabin Aryal

Abstract

The purpose of this study was to explore the symbol sense of basic level students' in algebra, to identify the students' error in an operating algebraic problems and investigate students' uses and interpretations of mathematical symbols and the influences that symbols have on students' activities when solving tasks of algebraic problems. The researcher conducted a case study of seven grade students with a focus on the goals and activities they selected and the anticipations and reflections they made as they worked on algebraic problems in different settings. Data were collected and analyzed under the conceptual lens of an activity effect relationship conceptual and a symbol sense framework. Seven different student (cases) were investigated, and data were analysis. The researcher found that some symbols and symbolic structures had strong influences on students' choices in problem solving.

The researcher firstly visit the sampled school and assessment test were taken among 26 students. The seven multiple cases were chosen from poor as well as high performance in assessment. The researcher found that students' goals and activities are often influenced by the presence of inequality signs, fractions, absolute value symbols, and rational symbolic structures and tracheotomy sign, the equal sign influences students' goals, but as an indication for operations to perform instead of as a representation of a relation, students' goals and activities are often influenced by anticipations for particular symbols or symbolic forms to be contained in the result, activities and goals do not often include the symbol sense for making links between symbolic representations and graphical or numerical representations.

The researcher concluded that symbol sense includes understand that there is a constant need to check symbol meaning and to compare meanings with one's own expectations and intuitions. Teachers can demonstrate such reflective habits in the

classroom and help students learn the importance of constantly reflecting on the effect of an activity as simple as writing an equal sign. It might be helpful for teachers to ask students to read mathematical statements aloud from a textbook and to discuss the meanings of the symbols involved. Building symbol sense can help build students fluency with the complicated language of mathematics.

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INFLUENCE OF SYMBOLS ON BASIC LEVEL STUDENTS' IN SOLVING ALGEBRAIC PROBLEMS

A

THESIS

BY

SABIN ARYAL

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE THESIS WRITING IN MATHEMATICS EDUCATION

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