UNIVERSITI TEKNOLOGI MARA

FRACTIONAL NUMBER SENSE ABILITIES AMONG UPPER PRIMARY SCHOOL PUPILS

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ABSTRACT

This study explored the abilities in fractional number sense among selected primary school pupils' in Klang, Selangor. This concern was motivated by the fact that fraction is a very challenging topic and can be a problem for pupils as described in the literature review of this thesis. The objectives of this research are to examine pupils' performance in a Fraction Sense Test (FST), to investigate the pupils' achievement in FST based on grade levels and genders, to investigate the relationships between pupils' performance in FST and their mid-year mathematics achievement and finally to investigate strategies used by pupils in solving problems in the FST. The data in this mixed method design were obtained from two phases of analysis. The first phase analysed 396 Year Four and Year Five pupils' achievement in a Fraction Sense Test (FST) which was adapted from McIntosh, Rey and Reys (1992) framework of Basic Number Sense and also analyses their mathematics achievement based on the standardized mid-year mathematics examination. The second phase investigated how the pupils applied their fraction-sense strategies in FST through interviews. The overall results of this study revealed that the pupils demonstrate limited fraction sense and possessed very few of the indicators of fraction sense. The findings expose a lack of conceptual understanding of the domain fraction concept, effect of operation, and equivalent expression of fractions. It is also found that there was a significant difference in the FST achievement between grade levels. Meanwhile, no significant difference was identified between genders. The pupils also had little or no access to flexible fraction sense strategies to solve problems in FST. The study of relationship between pupils' performance in FST and their mathematics achievement also suggested significant association for both grade levels. It is hoped that Malaysian Ministry of Education and mathematics teachers would benefit from this study as it provides overview information of pupils' real ability in mathematics especially in fraction topic.

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CHAPTER ONE
INTRODUCTION

1.1 Introduction

Mathematics is a field of knowledge that is closely related to the everyday activities of our lives. Mathematics is usually regarded as an abstract subject and requires pupils to think systematically and logically (Norfarhana, 2010). Generally, the goal of learning mathematics is to help pupils develop an understanding of concepts that lasts a lifetime and grows to meet the changing demands of society. In order to be adaptive to the technological society changes of the 21st century, pupils must be equipped with appropriate mathematical skills that is flexible, adaptable and creative. Pupils must have the ability to interpret, evaluate, recognize patterns, make comparisons, and understand relationships from data.

Mathematics trains the mind to think logically and systematically in solving problems and making decisions. This discipline encourages meaningful learning and challenges the mind, and hence contributes to the holistic development of the individual (Ministry of Education, 2015). In order to apprehend the importance of Mathematics, the teaching and learning process that uses KBAT/HOTS (High Order Thinking Skills) is currently the centre of educational attention. In Malaysia, both the revised *Kurikulum Standard Sekolah Rendah* (KSSR) and the Malaysia Education Blueprint (2013-2025) have given sifnificant emphasis to the fostering of HOTS in the teaching and learning process.

According to King, Goodson & Rohani (2013) HOTS includes the formation of concepts, critical thinking, creative, problem solving, mental representation, reasoning, and logical thinking that should be implemented in the process of teaching and learning at the school level. One of the aspects of HOTS in mathematics is understanding of the use of equivalent forms and multiple representations that require pupils to know that numbers can be in various forms (either figures or representations). When pupils are given the opportunity to calculate, do number operations or solve problems, they have actually used a strategy that indirectly shows how to think about number sense and problem solving (Munirah, 2016). The number sense component is