

## **UNUSUAL RESPONSE PATTERNS OF 'KEY STAGE 3' PUPILS IN SOLVING NUMERICAL DIVISION PROBLEMS**

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To achieve adequate basic mathematical skills needed for everyday life in the modern world it is necessary to lay a proper foundation at the primary level. In Sri Lanka, primary education system consists of Key Stage 1(Grades 1&2), Key Stage 2(Grades 2&3), and Key Stage 3 (Grade 5). This study sought to investigate unusual response patterns of Key Stage 3 pupils in solving numerical Division Problems (DP) with special emphasis on the types of errors that they commit due to inherited misconceptions. The objective of this study is to address the following three research questions:

- (i). What are the prominent patterns of unusual responses that related to numerical DP among Key Stage 3 Pupils?
- (ii) What are the inherited misconceptions of Key Stage 3 pupils related to numerical DP?
- (iii) How can the correct unusual responses be utilized to improve the primary mathematics textbooks to overcome the difficulties of Key Stage 3 pupils in the sections of division?

Data for the study were collected from primary pupils, primary teachers, and educationists using quantitative and qualitative methods. The sample consistd of 551 students from six schools in the Akurana Education Division in the Central Province. Using Sato Caution Index (SCI ) 60 answer scripts were selected out of 551. This sub-sample consisted of high achievers who got incorrect responses for easy question and the balance consisted of low achievers who got correct responses for difficult questions. Several item analyses were carried out using the test information to identify difficulties and error patterns related to numerical DP of Key Stage 3 pupils.

This study revealed that when zero appears in the answer or in the dividend in numerical DP more than 75% of the students in the sample faced difficulties on these items. It was also found that 80 % of the students in the sub-sample did not include the zero in the tenth place of their answers. This indicates the importance of "place value method" that should be highlighted in the primary mathematics curriculum. Some unusual response patterns are due to misconceptions about the basic arithmetical operations and the digit zero. Analysing the test items further it was found that some of the unusual responses can be utilized to develop new methods, which are suitable for primary level textbooks in the sections of division. These findings can be used fruitfully to upgrade mathematics education by providing special training to primary mathematics teachers via workshops.

