

Adirek Chalaewchalad. (2020). A Development of an Instructional Model to Adjust Misconceptions in Algebra for Lower Secondary School Students. Doctor of Philosophy Curriculum and Instruction. Assoc. Prof. Dr.Kanreutai Klangphahot Asst. Prof. Dr.Suwanna Juithong Asst. Prof. Dr.Usa Kongthong

ABSTRACT

The study was a mixed methods research. The purposes of this study were to 1) analyze and synthesize the components of algebraic misconceptions, 2) develop an instructional model to adjust the misconceptions in algebraic, and 3) evaluate the implementation result of an instructional model for lower secondary school students. The research consisted of three phases: 1) to analyze and synthesize the components of algebraic misconceptions. The sample group was 400 lower secondary school students, under the local government organization Saraburi Province by multistage cluster sampling method. The research instrument was a diagnostic test in terms of misconceptions in algebraic. The data was analyzed using second-order confirmation element analysis, 2) to develop an instructional model. Check suitability and the possibility of an in instructional model being developed by 7 experts. The tools used for to examine suitability assessment, and 3) to study the result of an instructional model. The 40 samples treatment group, selected by multistage cluster sampling method and were conduction of grad 1 students in academic year 2019. The experiment employed 16 hours. The tools used to collect data were diagnosis the factor of misconceptions in algebraic; mathematics achievement. The statistics used to analyze data was mean, standard deviation and t-test.

The results of the research revealed that: 1) The misconceptions in algebraic consisted of 3 factors as follows: (1.1) regarding language and symbols, (1.2) regarding the use of definitions, theorems and properties, and (1.3) in relation to the process of operation and conclusion, consistent with the empirical data, comprising 33.41 of Chi-square, 23 of degree of freedom, 0.074 of significance level, 0.034 of root mean square error of approximation, arranged in a descending order. 2) The developed instructional model of 4 components, including (2.1) the model concepts, a format focuses on students participation, take action, create of misconceptions by self, check and adjust misconceptions to be correct, (2.2) the model objective, (2.3) the instructional process comprising 5 steps: Step 1; the connection of misconceptions (Connection: C), Step 2; the construction of algebraic misconceptions (Construction: C), Step 3; the check of algebraic misconceptions (Check: C), Step 4; the change of algebraic misconceptions (Change: C), and Step 5; the check of algebraic misconceptions (Check: C), and (2.4) the appropriateness and the feasibility of the model, overall evaluated at a high level ($\bar{x} = 4.50$, S.D. = 0.41). 3) The results of the instructional model found that: (3.1) students after being taught by the instructional model higher than those of student before being by the instructional model at 0.05 level of significance, (3.2) students after taught by the instructional model was higher than minimum criteria 70 percent at 0.05 level of significance, (3.3) the achievement of students learning taught the instructional model higher than those of student before being by the instructional model at 0.05 level of significance, (3.4) the achievement of students learning taught the instructional model higher than minimum criteria 70 percent at 0.05 level of significance.

Keywords: Factor Analysis, Instructional Model, Misconceptions