

2. เกณฑ์ปกติสำหรับนักเรียนชั้นมัธยมศึกษาปีที่ 2 ของโรงเรียนในจังหวัดมหาสารคาม อยู่ในช่วงคะแนนตั้งแต่ T21 ถึง T74 และมีเกณฑ์ปกติในแต่ละด้าน คือ ด้านการวิเคราะห์ ความสำคัญ อยู่ในช่วงคะแนนตั้งแต่ T33 ถึง T69 ด้านการวิเคราะห์ความสัมพันธ์ อยู่ในช่วงคะแนน ตั้งแต่ T34 ถึง T74 และด้านการวิเคราะห์หลักการ อยู่ในช่วงคะแนนตั้งแต่ T28 ถึง T71



มหาวิทยาลัยราชภัฏมหาสารคาม
RAJABHAT MAHASARAKHAM UNIVERSITY

Title : The Construction of Analytical Thinking Ability Tests in Mathematics for Matthayomsuksa 2 Students

Author : Mutinee Wangsan **Degree :** M.Ed. (Educational Research and Evaluation)

Advisors : Asst. Prof. Dr. Arun Suikraduang Chairman
 Asst. Prof. Dr. Arunee Jansila Committee

Rajabhat Maha Sarakham University, 2015

Abstract

The objectives of this research were to determine qualities of a test for assessing Mathayomsuksa II students' analytical thinking abilities in mathematics, and to establish the norms of their test scores in analytical thinking abilities. The sample group, obtained by using multi-stage random sampling, consisted of 863 Mathayomsuksa II students studying in the second semester of the academic year 2014 in 23 schools in Maha Sarakham Province. The instrument used in this study was a four multiple-choice test comprising three parts of 15 items each, designed to measure 3 aspects of Mathayomsuksa II students' analytical thinking abilities in mathematics: Importance, Relations, and Principles. The statistics used in analyzing data were mean, difficulty index, discrimination power, reliability determined by using the KR-20, construct validity determined by using Confirmatory Factor Analysis, and Normalized T- scores for determining the test norms using predicting equation.

Findings are as follows:

1. The qualities of the test for measuring Mathayomsuksa II students' analytical thinking abilities in mathematics are determined as having construct validity with the mean of experts' opinions ranging from .60 to 1.00, the difficulty index of .41 - .71, the discrimination power of .25 - .67, and reliability of .87. Regarding the construct validity of the test as determined by using Confirmatory Factor Analysis, the weights of the three aspects were found within the range of .35 - .58, with every value meeting the established criterion, at the .01 level of statistical significance; and this is in congruence with the empirical data: Chi-square $\chi^2 = 723.23$, $\chi^2/df = 686$, p-value = .16, $\chi^2/df = 1.05$, GFI = .93, AGFI = .90, RMR = .02, RMSEA = .01 and CFI = 1.00. This can be concluded that the constructed test is valid in terms of content validity.

2. The study reveals that the norms of the test of Mathayomsuksa II students' analytical thinking abilities in mathematics are within the normalized T-score range of T21 -T74, with the three aspects of their analytical thinking abilities found as follows: Importance (T33 - T69), Relations (T34 - T74) and Principles (T28 - T71).



มหาวิทยาลัยราชภัฏมหาสารคาม
RAJABHAT MAHASARAKHAM UNIVERSITY