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TITLE: Determining Fifth Grade Students' Misconceptions on Polygons and Quadrilaterals

ABSTRACT

In this study, a study of what are the fifth graders' misconceptions about the concept of "polygons" and "quadrilaterals" is conducted and their reasoning underlying their responses is tried to be revealed in the analysis. Data is collected through using an instrument developed by the researcher as "The Identification Test For Fifth Grade Students' Misconceptions About Polygons and Quadrilaterals". Identification test included questions such as open-ended, multiple choice, true-false and drawing necessary types to figure out the participants possible misconceptions in a variety of ways.

In addition to the questions to reveal the participants' misconceptions, there is also placed a "reasoning" section that they have to fill out below each questions to let them explain why they think so. In the analysis of the participants' responses, their answers given to multiple choice test items along with their reasoning are taken in consideration.

Related question is taken as a category and expressions about their reasoning are coded thoroughly to analyse the findings. Detailed tables are prepared for the answers of multiple choice questions and for the reasoning explanation of these answers. The distributions of participants' responses to the multiple choice test items, the frequency and percentage values of their explanations that they give when explaining their reasoning are placed in these tables. Answers in the multiple choice part of the test as well as the reasoning part of the test were graded as "true, partially true and false" and numeral grading is also accomplished accordingly for each answer. To analyse data about the personal informations, participants' interest and participants' affections towards mathematics and geometry and to calculate the scores from multiple choice tests, SPSS 11.5 statistics program for windows is used.

Regarding the reasoning part of the study, which regards to the qualitative aspect of the study, data from participants' is analysed according to the principles of the qualitative research method and children's misconceptions and possible reasons of these

misconceptions are presented in details. Thus, the model of this study is designed as a qualitative and quantitative mixed resarch model.

This study is conducted with fifth grade students attending elementary schools in the central schools of Aydn in 2009-2010 educational year. Three schools are chosen randomly from among the central scools of Aydn and 200 fifth grade students attending these schools are taken as the sample of the study. According to the findings from this study, fifth grade students' are found having some misconceptions on polygons, triangle, square, rectangle, parallelogram, rhombus, pentagon, hexagon, trapezoid, diagonal and altitute. The most important findings are as follows; "students do not see a triangle as a polygon", "students view a polygon given in unusual form as not a polygon", "they are confused with 45° turned square as thinking of it as a rhombus", "they think triangle as if it has a diagonal", "they think a polygon with more than four sides or a polygon of which corners are not opposite as if it does not have a diagonal", and "they think that polygons with equal sides should have equal diagonals".

KEY WORDS: Geometric Misconceptions, Geometry In Elementary Schools, Polygon, Quadrilateral, Teaching Geometric Concepts