Strategies Used by Primary Mathematics Teachers to Generalize Shape Patterns

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ABSTRACT

Patterns, defined as the ordering of numbers, shapes or objects following a rule, play an important role in the development of students' algebraic thinking. The development of algebraic thinking in mathematics education is based on the relationships between qualities and quantities. According to Dörfler (1991), generalization of patterns can be described as one way to achieve algebraic thinking.

There are two types of patterns: repetitive patterns and extending patterns. In repeated patterns, elements called repetition units are repeated recurrently, whereas in extending patterns, the number of components of an element in a sequence systematically increase or decrease (Zaskis and Liljedahl, 2002).

Strategies used by students to generalize patterns can be divided into three categories: numerical, visual, and both visual and numerical. The most prominent of these are salient, recursive, whole-object, cumulative and contextual strategies. Students, teachers and prospective teachers are found to make more use of numerical strategies, and generally do not prefer to use visual strategies.

This study aims to identify the strategies used by prospective primary math teachers to find the rule and adjacent term of a fixed-increase extending shape pattern. Designed as a case study, this study was conducted with the participation of 46 prospective teachers attending the Primary Mathematics Education program of a public university in northeastern Turkey.

Data collected show that a total of 108 answers were given in response to the shape pattern question. These answers were grouped under two categories. Thirty seven percent of the students used a rule-based strategy, 36% used recursive relationship strategy, 18% used intra-term division strategy, 6% used term merging strategy, 2% used arithmetic sequence strategy, and 1% used term addition/extraction strategy. About 25% of prospective students used visual strategies to find the rule and 9th term of the shape pattern.

REFERENCES

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