THE EFFECT OF USAGE OF CONCEPT-MAPPING ON STUDENTS' PROBLEM-POSING ABILITY: AN EXPLORATORY STUDY

Sicheng Xie[1]; Shengying Xie[2]
1. East China Normal University, China; 2. Hunan Normal University, China

This study aimed to explore the effects of teachers' use of concept maps in mathematics classroom on students' ability in posing mathematical problems. A pre- and post-test quasi-experimental design was employed. 85 nine-graders in two classes with a comparable background and two mathematics teachers participated in the quasi-experimental study. The teacher of the experimental class employed concept maps in mathematics classroom for 3 months. Through classroom observation, tests and follow-up interviews, results show that the utilization of concept maps by teachers in classroom has a positive impact on students' mathematical problem-posing ability.

MAIN SECTION

Figure 1 shows theoretical support of this study based on Kilpatrick's (1987) preliminary thoughts on the shape some of the problem-formulating processes might take.

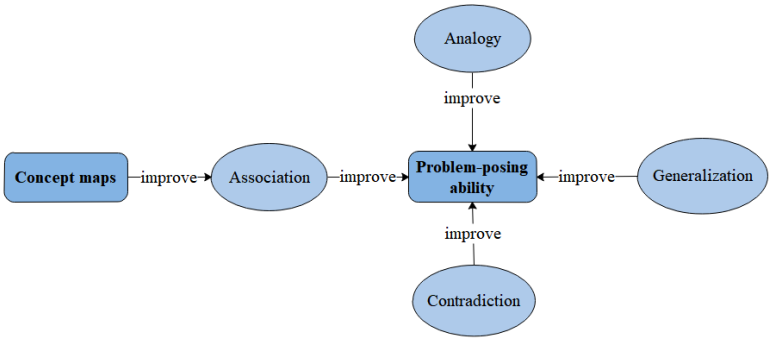

Fig. 1 Theoretical connections between concept maps and problem posing

As Figure 2 depicts, this study explores effects of concept map usage in the mathematics classroom. The results show that concept-mapping teaching strategy can improve students' mathematical problem-posing ability, especially reducing invalid mathematical problems. There is no statistically significant difference between different groups in terms of mathematical problems posing. There is no statistically significant difference between male and female students in terms of the effects of this quasi-experiment, but girls in the experiment group benefited more than boys from concept maps.

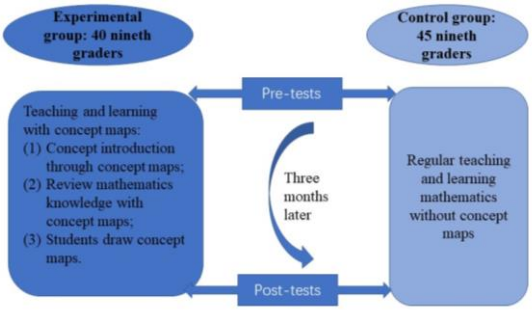

Fig. 2 Flowchart of research design

References

Kilpatrick, J. (1987). Formulating the problem: Where do good problems come from? In A. H. Schoenfeld (Ed.), *Cognitive Science and Mathematics Education* (pp. 123-147). Hillsdale, NJ: Lawrence Erlbaum Associates.