

COGNITIVE PROCESSES IN PROBLEM SOLVING OF SYMMETRIC FIGURES

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This study was aimed to investigate cognitive processes in geometric problem solving among 52 first year students of mathematics teacher education program of Lampang Rajabhat University. To accomplish the study purpose, Duval (1998) was used as a theoretical framework which composed of three processes: visualization, construction, and reasoning. Research methodology employed participatory research as the researcher was a lecturer of Mathematical Problem-Solving course and used an Open Approach as a teaching approach (Inprasitha, 2011). Case-study problems were symmetric figures which adapted from Japanese textbook 'Gateway to the Future: Math 1 for Junior High School', these problems were taken from the Math Dojo which presents problems that involve students to use mathematics in a way of sparking their further interests (Kerinkan, 2013).

Results of the study showed that 1) Reasoning-Visualization: after students saw figures (M- and N-shape), they tried to figure out these figures, then built a gestalt and configuration of the figures; 2) Visualization-Reasoning: not found because of the students actually think reasonably before visualization; 3) Reasoning-Construction: students argued about the figures composed of pairs of side which are the same length and area then they tried to make the figures on a paper by themselves; 4) Construction -Visualization: after the students made their own figures, they tried to differentiate sides and areas of the figures, then they found a symmetry line on the M-shape and symmetry point on the N-shape; 5) Reasoning (5A) students described by using their own language such as there is only one line that divide M-shape into two parts equally, (5B) students described by using propositions such as there are two corresponding points that connected by a line pass through a point for N-shape. Findings showed that students of the mathematics teacher education program could realize the students' difficulties of the problems will be used in schools.

References

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