

IMAGERY IN GEOMETRICAL PROBLEM SOLVING

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The essential role of imagery on students' geometric reasoning has been researched extensively (Bishop 1989). Different types of imagery have been proposed (Owens & Clements 1998, Persmeg 1986). Usually students are not restricted to only one type of imagery, they use or combine different types of imagery simultaneously, according to the situation.

Nevertheless, the school system discourages visualization and imagery as proper tools for the formal solution of mathematical problems, especially after 9th grade, giving emphasis to abstract thought and typical proofs. As a consequence, "geometric- type" students (according to Kruteskii's typology) are assessed as "low-ability" ones.

The present contribution is based on the case study of a 10th grade student with a poor theoretical background, whose mind is "dominated by images". Faced with four geometry problems, demanding different types of construction, she is led to unexpected solutions. This ability is altogether unknown both to her school and her, since she is assessed as one of the weakest students of her class and she believes she has no aptitude in Geometry.

Analysis of the student's responses shows that imagery can function positively both for the understanding and solving of geometrical problems, even in cases of students with a relatively poor theoretical background.

1. Bishop, A. (1989) *Review of research on visualization in mathematics education*, Focus on Learning Problems in Mathematics 11(1), 7-16.
2. Krutetskii, V.A. (1976), *The psychology of mathematical abilities in schoolchildren*, The University of Chicago Press, Chicago and London.
3. Owens, K. & Clements, M.A. (1998), *Representations in Spatial Problem Solving in the Classroom*, Journal of Mathematical Behavior 17 (2), 197-218.
4. Presmeg, N. C. (1986), *Visualization in High School Mathematics*, For the Learning of Mathematics, 6, 3, 42-46.