

DEFINING A RECTANGLE UNDER A SOCIAL AND PRACTICAL SETTING BY TWO SEVENTH GRADERS

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1 · Purpose of Study

- § What kind of activities could initiate 7th graders into defining?
- § How would the students reason when they involve in the defining activity?

2 · Method: designing a Social and Practical Setting

- § Social: interviewers' intervention and peer discussions
- § Practical: the swimming pool task

3 · Findings

- § propositions: e.g., if two opposite angles are right angles in a quadrangle, it is a rectangle.
- § concept/theorems-in-actions (Vergnaud, 1998) : e.g., stereotyped concept image of right angles is horizontal and vertical.
- § apprehensions (Duval, 1995) : perceptual, operative, sequential and discursive

4 · Conclusion

- § Students are stimulated to develop definitions by the innovative task.
- § Implicit theorems/concepts support students' apprehensions of figures.
- § Defining can be the beginning of learning to prove.

Reference

- Duval, R. (1995). Geometrical pictures: Kinds of representation and specific processings. In R. Sutherland & J. Mason (Eds.), *Exploiting mental imagery with computers in mathematics education*, 142-157. Berlin: Springer.
- Vergnaud, G. (1998). Towards a cognitive theory of practice. In A. Sierpiska & J. Kilpartick (Eds.), *Mathematics education as a research domain : A search for identity*, 227-240. Dordrecht, Netherlands: Kluwer Academic Publishers.