

Review

The Modern View of One Specific Didactic Phenomenon

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Žilková, K. (2013). *Teória a prax geometrických manipulácií v primárnom vzdelávaní. Theory and Practice of Geometric Manipulations in Primary Education*. Praha: Powerprint.

Constructivistically oriented pedagogical trends provide a theoretical basis and inspiration for the development of many partial and specific didactic problems in the teaching theory and practice of education in all the school grades. For example, in the context of pre-concept models and didactic theories in the reconstruction of educational environment they show significant study activities which are aimed at building schemes and representations in various disciplines and also in the didactics of mathematics and geometry. This also applies to the Czech educational environment. Katarína Žilková, a Slovak author, wrote an interesting monograph where she partially analyzed the issue.

The author wrote the publication as a monograph with two key interconnected topics. The two main chapters of the monograph are: *"Manipulating and Modeling"* and *"Research of the knowledge of quadrilaterals in students studying to become teachers."* The term manipulation is the main, important and unifying concept in the text in terms of student/child activity, leading to a systematic and deliberate development of geometric thinking. The interconnection of both parts of the monograph is assured by the educational content (geometric concepts and "how to understand them"), and from the point of view of "target groups" which there is a focus on. The target groups are primary school students and their (future) teachers.

Manipulating and modeling – this part mainly covers theoretical foundations. The subchapters called "The ways of modeling and manipulating and their divisions" and "The models in the context of cognitive process" are packed with information. The

author presents some schemes, models and representation in the development of thinking, reflecting relevant pedagogical and psychological concepts – Piaget's concept of stages in the evolution of intelligence, Bruner's representation of cognitive development and Bolzano-Popper's three "worlds". The author bases the monograph on these theories, even though she has her own view about manipulating activities and manipulating modeling as well as the newly used virtual environment and the virtual manipulation, but also about the level of the mental modeling and mental manipulation. The author also presents Hejný's word-formative structure process in mathematics and she points out connections between it and Van Hiele's five hierarchical levels of cognitive process in geometry.

The chapter called *Research of the knowledge of quadrilaterals in students studying to become teachers* is a summary study of the author, based on the necessary theoretical knowledge. The author then confronts her own outputs with the knowledge of foreign authors. The author defined the research problem set as a description and subsequent analysis of the properties of quadrilateral knowledge as one of the basic concepts of plane geometry based on a sample of students getting ready to become teachers in pre-primary and primary education in Slovakia and in some European countries (Scotland, Romania, Turkey). One of the findings of the author is that the respondents tend to understand the different categories of quadrangles as disjointed groups and they are not able to understand that some quadrangles are subsets of the others. As the author states, it is related to different didactic approaches in learning quadrangles and it is also related to their classification in textbooks, but it is also related to the specificity of its terminology. The research results indicate that the formation of geometrical concepts is a complex process, in which wrong and unstable concepts are often created. The author specifies and suggests a potential use in educational practice in some specific and useful handling activities that help to create a correct concept of rectangles, such as the folding and cutting paper or geoboard activities or interactive computer technology.

The point of view of the author of the monograph is modern. This confirms the fact that she is a distinctive, well shaped personality with the necessary knowledge in the field of didactic scientific research. The already critiqued monograph inspires further studies and thinking, and it shows challenges, which will be encountered on the way to knowledge.

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