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## **ON (MIS)-UNDERSTANDINGS OF PRE-SERVICE TEACHERS CONCERNING CONSTRUCTIONS OBJECTS IN DYNAMIC GEOMETRY**

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The problem of construction of geometrical object with given properties is a classic motive of elementary mathematics. Mathematical educators see these issues as a powerful tool for comprehension of deductive structure of geometry and for development of mathematical 'habits of mind' [1]. During the period of more than twenty years, the straightedge-and-compass constructions have been excluded from the school curricula in Israel. As a natural result, students were not able to construct the simplest geometrical objects, but it also lead to significant degradation in understanding of logical structure of geometry even for advanced-level high school graduates [2] and for pre-service math teachers [3]. Only last years, the new curricula and textbooks do include the construction problems with classic tools or/and in dynamic geometric environment (typically with GeoGebra.

Prospective teachers of mathematics typically need to deal with such problems through their academic training. For good part of them, it is just the first experience both with simplest geometric constructions and with dynamic geometry. In Gordon Academic College, they study a series of courses targeting to force the usage of technology in teaching and learning mathematics [4], and it includes some basic features of GeoGebra for algebra and for 2D Euclidian geometry.

As a part of their learning course Teaching Workshop, students discuss mathematical and didactic aspects of teaching the issue "The Family of Quadrilaterals" as a core issue that emphasizes the idea of logical relations between different geometrical objects [5]. This presentation discusses the result of experiment with primary- and secondary-school pre-service teachers in this field.

Students have been asked to construct several family of quadrilaterals by different manners: each time using some characteristic property as a definition of an object. The solutions include both correct and defect constructions. In the last case, students typically impose hidden additional restrictions on the set of objects through the construction. Since the family constructed is a subset that satisfy the definition, the additional restriction is not immediately evident for the students. This situation invites the analysis of construction protocols by groups of students with further mathematical and didactic illuminations within the course including.

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