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GEOMETRIC „FISHING ROD"

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In most curricula of major courses offered by Polish universities and institutions of technology there are subjects comprising geometric topics – e.g. engineering graphics, engineering geometry, etc. In some major courses of Silesian University of Technology, such as Environmental Engineering and Construction, the traditional names of the courses have been maintained – "Engineering Drawing and Descriptive Geometry" at Environmental Engineering or in the changed sequence "Geometry and Engineering Drawing" at Construction. The changes that have been implemented in Polish tertiary education after 1989, comprehensively analysed and described in numerous publications as well as the authors' own didactic experience evoke the statement that out of the classic form of the subjects, in the cases of "Engineering Drawing and Descriptive Geometry" at Environmental Engineering and "Geometry and Engineering Drawing" at Construction, only the subject names have remained unchanged. [1] [2] [6] The substantial restriction of the number of didactic hours intended for the said subjects performance within the curricula forced the implementation of dramatic changes in the classic (at least by their names) subjects. The contents, effects and most of all –**methods of education –** had to be changed.

In the authors' opinion, the effective methods of education in the scope of the "geometric" subjects referring by their names to classic descriptive geometry are the methods based on direct demonstrativeness principle formulated by Pestalozzi in the 19th century. [3] [4] [5] The tasks using physical models or referring to the spatial topics known to the student, further the achievement of the primary effect of education, which in the case of geometry should be the **understanding** of the specific topic. The student's achievement of the effect of education, namely **understanding** a geometric topic may be compared to providing the student with the proverbial fishing rod by means of which their further individual studying and solving geometrical problems – "fishing in the whirlpools of knowledge" – shall become possible.

This paper presents three proprietary geometric problems performed in the course of studying the subjects: "Engineering Drawing and Descriptive Geometry" and "Descriptive

Geometry and Engineering Drawing" conducted at Silesian University of Technology. The problems represent specific models of „geometrical fishing rods" with relatively simple structure. In the authors' opinion, their simplicity and basing the subject matter on topics referring to direct demonstrativeness excellently facilitate achievement ot the primary effect of education by the students, namely **understanding** the topic.

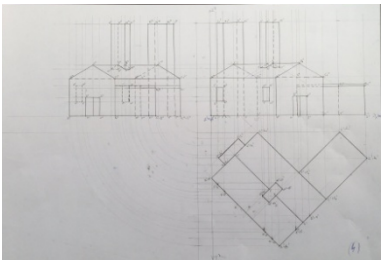

Fig. 1 Student's project – orthogonal projections being the solution of a problem performed within the course of „Descriptive Geometry and Engineering Drawing" at the Major of Construction

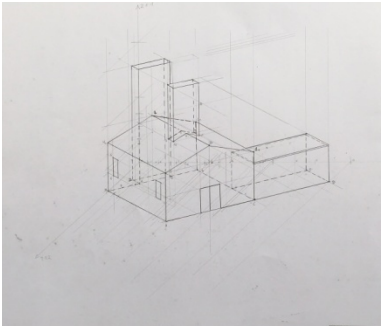

Fig. 2 – Student's project – an axonometric projection being the solution of a problem performed within the course of „Descriptive Geometry and Engineering Drawing" at the Major of Construction

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