Abstract

Title: ***Understanding Area and Volume Formulae of Geometric Figures in the History of Mathematics and by Pupils***

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The aim of this thesis is to describe the nature and possible causes of problematic areas in pupils' understanding of area and volume of geometric shapes and solids and treat this issue from the point of view of its ontogeny and phylogeny. Modern theories of gradual formation of the concepts of area and volume in pupils' minds will be characterized, together with the historical development of these concepts (from ancient Egypt and Greece to modern day). Complex analysis of the current Mathematics course books for primary and lower-secondary level is offered in the second part of the thesis. The analysis is based on the criteria following from the study of academic literature and on the historic research in this area. The aim of the analysis is to describe the way in which the course books treat geometric formulae and to what extent they respect their gradual development. In the final discussion, general aspects leading from the analysis will be summarized and offered as possible inspiration for pupils, teachers and future teachers of Mathematics.

Key Words: formula, area, volume, algebraic language, hypothetical learning trajectory