

FUNCTIONAL THINKING: CONCEPTIONS OF MATHEMATICS EDUCATORS – A FRAMEWORK FOR ANALYSIS

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Functional thinking as a “unifying principle” or “concentration principle” across K-12 curriculum can be described as a prototype of a fundamental idea and has caused many discussions about its importance for educational issues (Vohns, 2016). In the literature, there is a variety of definitions for functional thinking (Pittalis et al., 2020) what might cause differing understandings of this important concept. In order to inform the developmental work of the Erasmus+ project *FunThink – Enhancing functional thinking from primary to upper secondary school*, mathematics educators’ conceptions of functional thinking are explored. Therefore, views on functional thinking from mathematics educators in European countries were gathered to answer the research question *which conceptions on functional thinking do mathematics educators in the five countries Cyprus, Germany, the Netherlands, Poland, and Slovakia hold?*

To answer this research question, a total of 34 semi-structured interviews were conducted with mathematics educators in all five participating countries. This poster displays the inductively and deductively determined categories of a framework as well as exemplary results of the qualitative content analysis of the interviewees’ conceptions on functional thinking. The framework contains categories concerning the four aspects of functions, addressing functional thinking inside and outside of mathematics, patterning, the role of representations, mastery of semantic and syntactic elements, demarcation of this concept, and other interpretations. The determined categories represent the variety of definitions in literature and the diversity of conceptions of the interviewees. The presented framework will serve as a base for further analysis.

References

- Pittalis, M., Pitta-Pantazi, D., & Christou, C. (2020). Young students’ functional thinking modes: The relation between recursive patterning, covariational thinking, and correspondence relations. *Journal for Research in Mathematics Education*, 51(5), 631-674. <https://doi.org/10.5951/jresmetheduc-2020-0164>
- Vohns, A. (2016). Fundamental ideas as a guiding category in mathematics education. Early understandings, developments in German speaking countries and relations to subject matter didactics. *Journal for Didactics of Mathematics*, 37(Suppl. 1), 225-254.