

Abstract

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This dissertation examines the pedagogical beliefs of pre-service informatics and mathematics teachers about argumentation, its role in teaching, and their development during the first year of their master's studies. Pedagogical beliefs significantly influence teachers' professional decision-making and their instructional practice, and their investigation is particularly relevant in the context of curriculum changes emphasizing the importance of argumentation, critical thinking, and reasoning.

The theoretical framework connects the domains of pedagogical beliefs, argumentation, based on G. Stylianides's framework, and teacher knowledge (MTSK). For the field of informatics, the model Informatics Teacher's Specialized Knowledge (ITSK) was proposed.

The empirical part is qualitative in nature. The research followed 65 pre-service teachers (42 of mathematics and 23 of informatics) at two points in time – before and after completing subject-specific didactics courses. Data were collected through semi-structured interviews and the analysis of lesson plans and were processed using grounded theory procedures.

The findings show that students consider argumentation important, but initially understand it rather narrowly, mainly as explanation or proof. After completing the didactics courses, they perceive it more broadly, as part of learning, discussion, and the guidance of students' thinking. Differences between the two disciplines also emerged: in mathematics, argumentation is more strongly associated with proof, while in informatics it is linked more closely to programming and decision-making. Barriers to implementation were also identified, particularly time demands, teachers' uncertainty, and the demands argumentation places on students. The use of argumentation thus appears to depend on teachers' professional confidence and their ability to connect content-related, didactic, and psychological aspects of teaching.

The contribution of the dissertation lies in a deeper understanding of the formation of pedagogical beliefs and in emphasizing the need for the systematic development of argumentation in teacher education. A theoretical contribution of the dissertation is the proposal of the ITSK model.

Key words: argumentation, pre-service teachers' education, pedagogical beliefs, informatics, mathematics