

## ABSTRACT

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This dissertation explores the willingness of physics teachers to meet the current goals of physics education within the context of the national school-leaving exam. It is divided into a theoretical and a practical part. The theoretical section analyzes the target requirements for graduates, the legislation regulating the exam format, and the structure of exam tasks. The diversity of approaches to creating exam tasks leads to a typology of teachers, described through Cloninger's psychobiological model of personality and insights from neuroscience and other learning sciences according to Tokuhamu-Espinosa. The work also considers current trends – such as the use of sensors and the Coach/CMA system, flipped classrooms, synchronization of brain activities, and the development of mathematical thinking in physics. The practical part defines the research goals and proposes a pilot set of exam tasks. These tasks were developed based on theoretical insights and interviews with teachers and were tested on a small group of students. The analysis of physics exam tasks in Slovakia shows that the quality of the tasks is significantly influenced by the creator's personality profile and didactic preferences. New tasks that connect experimental measurements using the Coach system, mathematical modeling, and scientific reasoning increase student engagement and better address the target competencies of the National Curriculum. The dissertation provides recommendations for school subject committees in designing exam tasks, proposes a model of teacher professional development that considers typological differences, and outlines possibilities for future research at the intersection of neuroscience, personality psychology, and assessment in physics.

Keywords: school-leaving exam in physics, physics education, goals of physics education, neuroscience, teacher typology