

EXPLORING HUNGARIAN SCIENCE AND MATHEMATICS TEACHERS' PROFESSIONAL DEVELOPMENT NEEDS: A MIXED METHODS STUDY

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Orosz, Gábor; Purevjav, Davaajav

University of Szeged, Doctoral School of Education

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In the 21st century, the advancement of science and technologies is faster than ever before, reshaping our environment and causing unprecedented socio-economic challenges (OECD, 2018). Education has to keep up the pace with the ever-growing development of sciences and prepare students for lifelong learning, who are not always motivated enough. Science subjects were found to be the least popular in Hungary, especially physics and chemistry (Csapó, 2000), suggesting a demand for excellent teachers. In addition, increasing numbers of students with special needs, 7.5% in primary and 5.3% in secondary schools, present new challenges to be addressed (HCSO, 2018). Having a crucial role in this process, teachers must carry on their professional development. This study examines how Hungarian science and mathematics teachers perceive their professional developmental needs by exploring the following research questions: (1) How do Hungarian science and mathematics teachers evaluate their professional knowledge and needs? (2) Are there differences among Hungarian science and mathematics teachers by background variables? A self-developed online questionnaire was administered to 112 Hungarian science and mathematics teachers in 2018. They rated the same 18 components of teacher's knowledge on a five-point Likert scale from the following four perspectives: present knowledge level, importance in everyday teaching, professional development needs, and inclusion in formal IST. Additional information was gathered with an open-ended question. Of the closed items, 'Professional ethics and morality' got the highest and 'Using information from research to improve practice' got the lowest mean regarding present knowledge level. In the latter three perspectives 'Motivating students to learn' got the highest mean. 'Effective use of ICT', 'Selecting appropriate teaching methods', and 'Classroom management' were also regarded as important, pointing out that teachers need more help in these areas and are willing to learn. Regarding the open-ended question, 265 needs were mentioned that fall into 66 different themes. 'Using ICT' was the most frequently mentioned theme (N=55). Other frequently occurring themes were connected to learning new teaching methods (N=43) and supporting talented students or children with special needs (N=41). Both highlight that teachers desire to become better at differentiation. Regarding the differences by background variables, women expressed more need in including areas in formal IST and showed higher awareness in everyday teaching practice ($p < .05$). No significant difference was found by degree level. This study has a diagnostic relevance. It is the latest to provide information for the IST market in Hungary and highlights the areas that should be more targeted during pre- and in-service teacher trainings.