

## A RAPID REVIEW OF THE SCIENCE TEACHERS' SELF-EFFICACY

T-10

**Sara S. Pimenta \***, **Edit Katalin Molnár \*\***

\* *Doctoral School of Education, University of Szeged*

\*\* *Institute of Education, University of Szeged*

*Keywords:* Science teachers; Teachers' beliefs; Science education

In this literature review, we address the question 'What are the concerns in current high-impact research on the self-efficacy beliefs of science teachers?' Teacher professional development is driven by beliefs in self-efficacy, defined by Bandura as the personal beliefs of one's ability to execute a task and control the environment. They can be affected by mastery experience, vicarious experience, verbal persuasion, and emotional arousal. The studies included in the review were related (1) to in-service science teachers, and (2) to assessing self-efficacy beliefs. The keywords adopted were all generated through the PICO tool (Population, Interest, Comparison, Outcome) using efficacy-related keywords combined with possible teacher subjects (Science, Chemistry, Physics, and Biology). Web of Science and Scopus were the databases used to focus on journals with high impact factors. Limitations were applied to ensure coverage of papers published in the last five years (2017–2022) in the English language and with full text available. Using the strategy discussed, 164 papers were identified. The article abstracts were screened using the Rayyan application. 50 papers were selected to be read and 21 were retained for this review. Analysing the current research on science teachers' self-efficacy, and the papers' goals, research questions, and methods, three categories of research directions were identified: (1) Self-efficacy of teachers regarding implementation of new curriculum, alternative approaches, or pedagogical material; (2) Self-efficacy beliefs related to Technology, Pedagogy, Content, and Knowledge; 3) Self-efficacy related to professional development. As regards results, five studies on various topics within teaching science supported that teachers' self-efficacy is influenced by teachers' experience, positive emotions, and confidence in teaching a subject. Eight studies pointed out that teachers' content knowledge affects their self-efficacy towards technology and pedagogical knowledge. Eight studies that assessed professional development programs for science teachers reported positive impacts of the programs in enhancing teachers' self-efficacy. The instruments applied to assess teachers' self-efficacy included questionnaires, interviews, case studies, focus groups, and classroom observations. Limitations were found regarding small samples and interventions administered in short periods. Most papers identified in this review assess elementary school science teachers. A broader grade range would be more informative. For instance, more research on the self-efficacy beliefs of teachers at the upper secondary level in specific Science domains is needed. The review suggests in-service science teachers' self-efficacy receives less research attention than it would be needed for the development of training programs that could provide teachers with effective support for reflection.

*While working on this paper, Sara Souza Pimenta was the recipient of the Stipendium Hungaricum Scholarship.*