

## Teacher Professional Development Programs on K-12 Engineering Education: A Systematic Review of the Literature

**Authors :** Canan Mesutoglu, Evrim Baran

**Abstract :** Teachers have a prominent role in facilitating the place of engineering in K-12 classrooms. This study addresses the need to understand how teacher professional development programs focusing on K-12 engineering education can be designed and delivered more effectively. A systematic review of the literature on such programs can offer possible ideas and recommendations. The purpose of this study is to systematically synthesize the peer-reviewed articles published on K-12 engineering education teacher professional development programs. The methodology that guided the study was comprised of four phases: search, selection, coding, and synthesis. The search phase included articles published in the time period between 2000 and 2016. With a comprehensive search in databases, inclusion criteria were applied. This was followed by evaluation of the quality of articles with a checklist, and finally analysis of the results. The results revealed two categories of themes. These were 1) five themes related to the overarching agenda of the PD programs, and 2) five themes related to the instructional techniques of the PD programs. Finally, core elements were generated to guide the design and delivery of teacher PD programs for K-12 engineering education. The results aimed to provide a conceptual basis for future research and practice on teacher PD programs for K-12 engineering education.

**Keywords :** core elements, K-12 engineering education, systematic literature review, teacher professional development programs

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