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Barriers to Developing Physics Faculty Knowledge for Teaching: Identifying Gaps through Critical Review of the Literature

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Barriers to Developing Physics Faculty Knowledge for Teaching: Identifying Gaps through Critical Review of the Literature DEEPIKA MENON, University of Missouri, Columbia — In light of bringing reforms in STEM teaching at all educational levels to increase STEM workforce, The National Research Council (1999, 2003) and the Next Generation of Science Standards (NGSS, 2013) emphasize that STEM faculty should shift from traditional teaching to learner-centered instruction. Despite the call and significant efforts to encourage STEM faculty bring changes in their undergraduate instruction through the use of research-based instructional strategies, evidence suggest that only a small percentage of faculty members utilize the most of the pool available. This presentation will summarize the current literature on the barriers and common constraints which the physics faculties face to change their existing practices and use of research-based instructional strategies, and their perceptions of and about teaching. The findings are presented as five themes: a) mismatch between the thought processes of educational researchers and science faculty; b) dilemma to balance the time between research and teaching; c) personal beliefs about teaching and learning; d) graduate students preparation for the professoriate role in the science departments; and e) lack of pedagogical content knowledge. The potential solutions to such problems are discussed by providing existing exemplary programs and workshops that continue to prove successful in bringing desired changes in undergraduate teaching.

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