APR15-2015-000370

Abstract for an Invited Paper
for the APR15 Meeting of
the American Physical Society

**Grand Challenges in Physics Education Research: Teacher Preparation**

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The courses, curricula and programs that produce new K-12 teachers have been the subject of research in the physics education community for many years. In terms of recruitment, curricula, and mentoring, programs and pathways vary considerably from institution to institution. Each program addresses many different aspects of teaching including knowledge of the content and familiarity with best teaching practices. At the same time, even within physics (or physical science) there is a broad range of student outcomes that are considered important, including acquisition of factual knowledge, development of skill with disciplinary practices, and positive attitudes toward the discipline and one's own abilities. Given the broad range of both input and outcome variables it is no surprise that there are very few clear answers about the impact of teacher preparation on teachers, students and society. In this talk I will summarize some of the main findings to date, and identify some areas where much more research is needed.