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Historical Survey of Research in Physics Teacher Preparation¹

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There have been efforts to provide specialized preparation for prospective physics teachers for over 100 years, both in the U.S. and elsewhere. However, systematic research investigations of these efforts are much more scarce, particularly in the U.S. I will review some highlights of research in physics teacher preparation reported in the U.S. and in several other countries as early as the 1920s. The more recent investigations (beginning around 1970) reveal a pattern of teacher preparation practices emphasizing multiple, extended experiences in analyzing physical systems—and making and testing hypotheses of experimental outcomes—by developing and reflecting on laboratory-based physics activities that are often subsequently taught (as simulated “micro-teaching” or in actual classrooms), all under close guidance and intensive coaching from expert physics-teacher educators. Outcomes reported include improvements in the quality of experiment design (emphasizing student-generated explanations rather than rote procedures), and in ability to communicate, better awareness of physics teachers’ pedagogical knowledge, and improved learning gains by the teachers’ students on tests of conceptual understanding.

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