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Measuring Physics Teacher Knowledge: Is it Domain-Specific?

ROBERT TALBOT, VALERIE OTERO, DEREK BRIGGS, University of Colorado at Boulder — The development of reliable and valid measures of science teacher knowledge is essential for teacher education program evaluation purposes. A particular challenge to this effort lies in the fact that most programs serve pre-service teachers who have a range of disciplinary specialties and teaching areas (e.g., biology, chemistry, physics). Is it best to measure science teacher knowledge within an individual's area of science specialty, or can this be measured domain-generally for the sciences? In this research, we investigate this question by developing a physics-specific measure of science teacher knowledge. We then conduct an experiment in which we randomly administer a domain-general measure or the parallel physics-specific measure to individuals within a population of pre-service science teachers. We also observe the teaching practices of a subset of individuals in order to contribute to a validity argument for interpretations resulting from these measures. The empirical evidence gathered will serve to further develop an existing measure of science teacher knowledge—the Flexible Application of Student-Centered Instruction instrument—and will contribute to our theoretical understanding about a specific construct of teacher knowledge: pedagogical content knowledge.

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