GF03 9:00 a.m. Observation, Measurement, and Data Analysis in PER: Methodological Issues and Challenges*

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Just as in other areas of physics, researchers in physics education make use of a variety of observational tools and techniques and of forms of data analysis. In order to probe students' thinking, multiple-choice instruments, students' written explanations, individual interviews, and recordings of group activity are all employed. Each of these methods has both advantages and drawbacks, and it is frequently challenging to extract from this variety of data sources a coherent and consistent model of student thinking. Moreover, a number of challenging methodological issues are always present during data analysis, including uncontrolled "hidden" variables, reliability and validity of diagnostic instruments, multidimensionality of student knowledge states, etc. I will review some of the issues related to observational methods and data analysis, and offer a variety of options for addressing these problems in practical work.

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