

“I Like These Problems But I Can’t Use Them on My Test”: How Instructors Lower the Bar for Student Performance

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Problems are an important teaching tool in introductory physics courses. Their structure influences how students approach both the subject matter and the problem solving process.

For example, the structure of context rich problems involves features such as motivation connected to reality, having no explicit cues and integrating multiple steps. Thus, context rich problems require an expert approach: analysis (e.g. which principles of physics are useful, what approximations are needed), and planning and evaluating (e.g. forming sub-problems, reflecting on the solution process).

What problem features do physics instructors see as appropriate for an introductory calculus based physics course? What are their considerations to use or to give up different problem features in different circumstances?

To understand how instructors design and choose problems, the Physics Education Research Group at the University of Minnesota has developed an interview tool (Henderson, Yerushalmi, Kuo, Heller, & Heller, 2007) to investigate instructors’ views about the learning and teaching of problem solving. We focus on one part of the interview, in which instructors were asked to evaluate a set of five problem formulations that might be assigned for students to solve. The analysis of data -obtained from 30 college instructors- showed that although instructors frequently value many of the features of problems that enhance learning, in particular context rich problem features, their test problems rarely contain these features. We will present the interview tool, and discuss instructors' considerations in giving up these problem features in the test.

Henderson, C., Yerushalmi, E., Kuo V., Heller, K., & Heller, P. (2007) Physics Faculty Beliefs and Values About the Teaching and Learning of Problem Solving. II. Procedures for Measurement and Analysis, *Physical Review Special Topics - Physics Education Research*, 3 020110.