Abstract: Problem-solving is considered to be one of the central activities of engineering, and much of a student’s academic career consists of solving problems of various types. While much research has gone into studying how students solve design problems, there has been little work on the majority of problems students solve in their classes. These problems tend to be focused on a single concept and can be either closed- or open-ended. Using a think-aloud protocol followed by retrospective interviews we have investigated how students solve these typical classroom problems and the beliefs and identities they bring to the problem-solving process. We find that problem-solving approaches vary according to the epistemic beliefs of the students that is the extent to which they believe knowledge is given by an authority versus justified by an individual. Those students with less mature epistemic views create ambiguity for themselves even when the problem is closed-ended, suggesting that ambiguity can be created by the problem-solver and is not just a characteristic of the problem. We also find that students make a sharp distinction between academic and workplace problems and see little relationship between the two. Overall, our findings suggest that typical classroom problems may not be preparing students adequately for the problems they will face in the workplace and that the role of problem-solving as currently practiced in engineering education may need to be reconsidered.

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