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Promoting Incremental Research-based Instructional Innovation

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One guiding principle from the start of the Two Year College (TYC) Workshop project was that since, as the cliché states, “you teach as you were taught” most instructors are not equipped to adopt newer techniques, especially those involving major changes in approach. Some of the TYC workshops and curricular materials were designed to address this difficulty by providing tools for instructors to make incremental changes to their teaching approaches. The research-based approaches and materials presented in the workshops were often ones that an instructor could incorporate as small changes in a single class period, or a single laboratory activity. This presentation will review some of the physics education research results indicating the need for change from traditional lecture and cookbook based laboratories, where students are focused on producing answers, to alternative approaches where students are focused on having the physics make sense to them. Then I will describe some of the materials, such as Ranking Tasks, What, if anything, is Wrong Tasks, and Working Backwards Tasks, developed in the project to help instructors construct sense-making learning environments for their students. I will also describe how these materials, while developed with TYC instructors, are flexible enough to be of use to any secondary or college instructors who wish to make incremental changes in their instructional approaches.