



Efficacy Study of the Knowledge in Action Advanced Placement U.S. Government and Environmental Science Projects

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Educational Significance: Compelling economic and civic rationales substantiate the need for students to develop deep understanding and the ability to transfer it to other contexts. The traditional transmission model is not a good way to develop deeper learning. In contrast, the inquiry-based learning model -- of which project-based learning (PBL) is a type -- is designed to develop transferable deeper learning. The Advanced Placement (AP) redesign initiative is attempting to make AP courses more inquiry based, but the transition is challenging. The PBL AP courses developed through the Knowledge in Action (KIA) project at the University of Washington are based on design principles and a theoretical foundation that seek to address this challenge. The objective of this study is to test the KIA hypothesis that deeper learning and rigorous high school course work are compatible.

Overview of the Research Design: The research evaluation consists of two related research tasks. The Implementation Task will examine curriculum, instruction, and assessment approaches in traditional and PBL AP classrooms and the challenges and facilitators associated with both types of implementation. The Impact Task will use a randomized controlled trial (RCT) approach to estimate the causal impact of the KIA PBL on student outcomes. Structural equation modeling will be used to estimate effects of mediators and moderators on impact outcomes.

Rationale for the Research Approach: The study addresses three essential questions that are fundamental to the KIA effort. First, the approach will test the KIA hypothesis causally with the RCT approach, asking, "What are the respective causal effects of the PBL AP U.S. Government and Environmental Science courses on students' academic knowledge, ability to transfer their deeper learning, inter- and intrapersonal skills, and civic engagement?" Compared with other forms of causal inference, RCTs provide the greatest assurance that treatment and control schools are a priori similar on all measured and unmeasured characteristics. The ex post difference in average outcomes of students in treatment and control schools provides the best estimate of program impact by characterizing what would have happened to students without the treatment. Using appropriate qualitative and quantitative methods, this research will also address these essential questions: "What factors are associated with fidelity of implementation of the PBL AP models?" and "What are the processes and mechanisms through which effects occur?" The final results will show study participants and the greater community of educators and decision makers what PBL instruction looks like on a relatively large scale, the effects of that instruction, and the actions and conditions that are necessary for successful implementation.

Targeted Student and Teacher Outcomes: Student outcomes include the following: (1) scores on the relevant AP examination(s), AP course attendance, and exam-taking outcomes; (2) scores on the College and Work Readiness Assessment, a measure of transferable deeper learning; (3) responses to a survey that measures interpersonal (e.g., collaboration) and intrapersonal skills (i.e., metacognition) as well as learning engagement and civic engagement. Through surveys, instruction logs, interviews, focus groups, observations, and document review, the study will also measure teachers' engagement in professional development and program improvement as well as their knowledge, beliefs, and feelings of ownership of their PBL course. Accounting for moderators and contextual factors, RAND researchers will use the resulting data to describe the role the design principles, mediators, and proximal outcomes play in influencing the short-term distal outcomes.