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The Effectiveness of Project-based Labs on Learning the Process of Science: a SoTL Study

Laboratory courses are by definition havens for experiential learning; however laboratory exercises are expensive and time-consuming. Therefore, it is essential that lab courses meet educational objectives. I will present the results of my SoTL study to measure the effectiveness of an optional project-based laboratory component on increasing student understanding of the process of science in an introductory microbiology course for biology majors. This study was designed as part of the American Society for Microbiology's (ASM) Scholars-in-Residence program at the 2006 ASM SoTL Institute.

The study is designed to compare students who are or are not enrolled in lab on "process of science" questions embedded in their lecture exams. Because students who may already have a better understanding of process of science could self-select for the lab course, I normalize scores based on pre-test "process of science" scores, grades in other lab-mandatory biology courses, grades in the lecture component of the course or GPA (biology or overall).

People attending my presentation will learn about the process involved in designing a SoTL study such as the one above, obstacles to the process such as IRB approval, and how experimental design can affect results. In order to involve the audience and help them understand the design of this study, audience members will be administered pre- and post- tests similar to the ones given in my microbiology course. Participants can expect to learn about the effectiveness of experiential learning in a laboratory environment by actively engaging in the SoTL discovery process.