

Scientific Research in the Secondary Classroom: Peer Led Community Learning

Andrea Burzynski, Holly Dunderdale, Megin Rice, and Alyssa Weisenstein (Southern Illinois University Carbondale)

Contact information:

Alyssa Weisenstein, Email: alyssa.weisenstein@gmail.com, Phone: 19.651.6721

Poster Proposal

Abstract:

Traditional science often consists of “cookbook” style labs that include step-by-step instructions with known outcomes. These activities fall short of student involvement in authentic scientific processes and relevance when exploring impacts of human activity on ecosystems. Students’ understanding of what they have done or why may be lacking. A transition to authentic, meaningful labs is needed and holds hope for students understanding the importance of science processes and sustainable practices. These experiences align with science and engineering practices in the Next Generation Science Standards and can help students understand the complexity, uncertainty, messiness, and value of research. Modern scientific research often requires the collaboration of experts in various fields of study. Therefore, this project was designed to reflect authentic research as a collaborative, interdisciplinary effort of four teachers (chemistry, biology, and pre-calculus) at two high schools. While students studied the human impact of sunscreen wash in waterways by researching effects of different sunscreen wash concentrations on the germination rate of *Ceratopteris* (*C*-ferns) spores, the teachers investigated how students viewed their engagement in authentic research. Chemistry students reviewed the structure of sunscreens, biology students sowed spores and counted germination rates, and math students analyzed the data. All students watched a video on *C*-ferns and their life cycle. Each

group of students created a video explaining their portion of the research so that all students understood each stage of the process. Data sources included pre- and post-test surveys, student reflections, and researcher observations. Students demonstrated excitement about doing relevant, authentic research and experienced increased confidence in their abilities to conduct scientific research. There was a high level of student engagement and students concluded with a greater understanding of the nature of science.