

Friday, January 12, 2018

4:10 – 5:00 PM

Barnard Hall (EPS) 103

Improving Astronomy Student's Attitudes Toward Science: a 5 Year Study

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<http://www.physics.montana.edu/people/faculty/willoughby-shannon.html>

Abstract:

Within the last few decades, the American populace has become increasingly hostile toward science. This is exacerbated by the fact that non-science majors typically only take one or two science courses during their entire college careers. Physics Education Research has a rich history of studying the habits, alternate conceptions, and attitudes of physics majors, but there has not yet been extensive research on non-science majors enrolled in general science courses. Therefore, we have embarked on a five-year study to better understand the scientific attitudes and beliefs of students enrolled in our large lecture astronomy class for non-majors.

For two years, we collected baseline pre- and post-test data on our astronomy students using the reliable and valid Epistemological Beliefs About the Physical Sciences Survey (EBAPS). We found that students finished the course with degraded attitudes regarding their abilities to learn science, more likely to think that scientific knowledge is opinion based, and expressing non-expert-like beliefs about the structure of scientific knowledge as a whole. These results are not consistent with the goals we have for our students, so we used this information to guide course revisions.

We inspected the entire lecture schedule and revamped lectures that didn't typically last the whole class period. New material was added to explicitly address the nature of science, and how to spot pseudo-scientific beliefs. We also began to ask our students to reflect on their own understanding at multiple points throughout the course. After implementing the course revisions, we gathered EBAPS data for three more years and found much improved results. In this talk, we will discuss the results of the baseline and revised course data analysis. We will also share the materials we have developed to have students reflect on their understanding, to encourage them to see how science is applicable to their daily lives, and provide them opportunities to practice discriminating between science and pseudo-science.

Host: Rufus Cone

*** Refreshments served in the Barnard (EPS) second floor atrium at 3:45 ***