

Citizen Science Project Impact On Students’ Motivation, Attitude, And Self Efficacy In Chosen Career

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Focus Question

How does student participation in an active citizen science project of their choice impact their motivation, attitudes, and self-efficacy in their chosen STEM career?

Background

I am a graduate teaching assistant at Montana State University in Bozeman, Montana. The class taught is the lab portion of PHSX 222 Physics II with Calculus. The lab reinforces topics learned in lecture through a hands-on approach where students work in teams of two to three going through the assigned procedure. There are 63 students separated into four separate labs and they are mostly freshman and sophomore engineering majors. Most of the students in the course are mechanical engineers and only a few science majors.

Treatment

In addition to the regular physics curricula, my students would be participating in a three-week-long citizen science project. This project involves students participating in active citizen science projects that they find interesting or helpful to their chosen field. Students find these projects posted on the website Zooniverse.

Conclusion

From the Chi Square analysis, the improvements seen in the mean analysis are not statistically significant meaning that there is no impact on students’ motivation, attitude, and self-efficacy in their chosen career. I believe this to be the more accurate conclusions based on student responses, amount of time spent on each project being five minutes, and category of projects participated in being biology/nature. One student mentioned in their post project survey that “[The] [a]nswer is the same as first participation” and another student mentioned in their project report that “[he] do[esn]’t feel much different towards mechanical engineering after this project.” A major theme in the interviews conducted was that the project was more fun than useful to students’ careers, and although they all had positive experiences one student specifically mentioned it wasn’t completely relevant to him in his career. Given the choice students didn’t choose citizen science projects based on their career but based on if it was fun/interesting.

Data Analysis/Results

To determine impact, I compared the Pre/Post Citizen Science Project Survey using a mean, median, and mode analysis and to determine statistical significance I used a Chi Square test. After a mean, median, mode analysis there is a 12.5% improvement on students’ motivation, an 8.8% improvement on attitude, and a 7.5% improvement on self-efficacy in their chosen career (Figure 1). However, by a Chi Square statistical significance test the results are not statistically significant in any category. Based on emerging thematic analysis of the qualitative data, student response indicated that it was more fun than relevant to career.

Figure 1. Question five from the Pre/Post Citizen Science Project Survey Likert data histogram. Pre survey in blue and post survey in orange.

