OUTDOOR EDUCATION AND CITIZEN SCIENCE IN A HIGH SCHOOL FRESHWATER ECOLOGY SCIENCE CLASSROOM

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INTRODUCTION & BACKGROUND

I taught seniors and post-graduates at Brewster Academy, a private boarding school located right on the shores of Lake Winnipesaukee in Wolfeboro, New Hampshire. The study was conducted with three freshwater ecology classes, containing 42 junior and senior students. Students learned in small classroom sizes, 14 students each. Sixty-four percent of my students had learning differences.

RESEARCH QUESTIONS

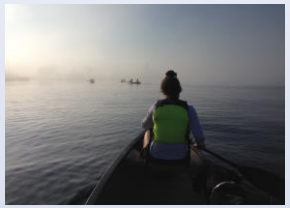
1. How will citizen science and outdoor education impact student learning in a freshwater ecology science classroom in high school?
2. Will using hands-on field activities increase student interest and engagement in freshwater ecology?
3. Will the use of citizen science help students make connections to their own lives, community, and understand the importance of their own environment?

METHODOLOGY

Six citizen science activities were conducted throughout the study period, September 2017 to May 2018, to allow students to have a real word, authentic experience. In each citizen science activity student information was gathered through, pre and post treatment student surveys were conducted, student interviews, student journaling, and student engagement tally sheets to assess student engagement further.

CONCEPTUAL FRAMEWORK

Citizen science is a partnership between the public and non-scientists in scientific research and education within the community. It has become a key tool in helping to collect, monitor, and analyze environmental change on both the local and global scale to positively impact communities. Citizen science has been incorporated with outdoor education, the organization of outdoor activities, which has increased experiential learning.



RESULTS

- A majority of students reported a benefit from lessons outside the classroom as well as indicating an increase of energy, pleasantness, and engagement.
- Ninety-eight percent of students strongly agreed that they benefit from having class outside in a pre and post survey.
- Ninety-six percent of student in their post survey said that they enjoy having opportunities to do citizen science projects.

STUDENT COMMENTS

"Being on the boat helps me learn, its nice just to get out of the classroom and apply what we are learning about."
"I like it when we have professionals come and talk to our class. The lake association talk made me feel like all the water quality data we have been doing was helpful to the people and town around Lake Winnipesaukee."
"My favorite part was when we got to go to the 2nd and 3rd grade elementary classes. Reading my drinking water storybook was so much fun and I felt like the kids liked having us there too."
"Explaining to the 5th graders about the DO test made me feel like a teacher myself. I liked that we were able to demonstrate how to use our tests with them outside."
"It was so cool feeding the brook trout at the fish hatchery. I can't wait to have our trout get that big and let them go in the river."

VALUE & FUTURE WORK

Allowing students the opportunity to be outside gave them a better idea of what they valued and remembered during hands on activities. Pre and post surveys were a great way to do a quick check-in with students about how they were feeling and allowed me to get a better idea of what was working in my classroom and what wasn't. I was surprised how many students said they enjoyed the class and took ownership over the actives. The passion that students displayed on the citizen activities was incredibly rewarding and reestablished my desire to form new community partnerships.

CONCLUSION

Citizen science increases student awareness and attitude towards the environment while encouraging curiosity. It also promotes engagement in their natural surroundings. The foundation of outdoor education is the idea that students learn best when they are in an environment that allows them to investigate the natural world. Providing students with opportunities to get outside of their own classroom and partner with real scientist allows them to think bigger than themselves and encourages learning to occur.