Citizen science may boost engagement and understanding in undergraduate biology classes

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Students on a ClimateWatch trail on the Crawley campus of the University of Western Australia. Credit: Mitchell et al (2017)

Citizen science projects, such as ClimateWatch, can boost engagement in undergraduate courses, according to a study published November 1, 2017 in the open-access journal *PLOS ONE* by Nicola Mitchell from The University of Western Australia, and colleagues.

Many citizen science projects involve the collection of data by a team of volunteers for the purpose of being used in scientific research. This hands-on approach to data collection could also be a potential teaching strategy to promote undergraduate science students' active engagement with environmental issues in their everyday surroundings and deepen their knowledge of the environment.

To investigate the effectiveness of incorporating citizen science into undergraduate education, Mitchell and colleagues examined the use of the Australian phenology citizen science program ClimateWatch in a University of Western Australia first-year biology class from 2011 to 2016. Using the ClimateWatch smartphone application and website, students monitored plants, animals, fungi and algae for potential changes in their life cycles and/or their distributions as the climate changes. In a parallel process, the students wrote a journal article focusing on one species' potential response to climate change, the validation of citizen science datasets, or a combination of both topics.

The researchers conducted surveys with 1500 students before and after they completed this citizen science project from 2011 to 2016. They found that this project significantly contributed to the phenological data on Australian's species, with about two-thirds of ClimateWatch's records between 2011 and 2014 coming from students enrolled in universities. It also greatly contributed to environmental engagement for the students since the majority (55 percent) planned to continue collecting data after the project was finished. on their own. and a large portion (35 percent) also introduced the application to their friends. Finally, students also learned how to analyze, present and interpret publish their phenological and distributional data as part of their studies, and the 130 student publications that have come from this program are testament to their discoveries.

The researchers hope to continue refining the program at UWA to produce more citizen scientists to work with ClimateWatch, and encourage more researchers to work with university citizen scientists, and in general to improve data quality.

As study co-author Nancy Longnecker says, "Becoming a scientist involves so much more than memorizing facts. Doing research in the 'real world' is an excellent way for students to learn and citizen science provides many opportunities."

More information: Mitchell N, Triska M, Liberatore A, Ashcroft L, Weatherill R, Longnecker N (2017) Benefits and challenges of incorporating citizen science into university education. *PLoS ONE* 12(11): e0186285. doi.org/10.1371/journal.pone.0186285

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