

Getting Citizen Science Into Schools

How can we encourage schools to participate?



Introduction

This literature review shows that to advance participation of citizen science in schools, citizen science organisations must be clearer about the processes of engaging with teachers, curricula, and school communities. Part of a PhD project considering the impact of school-based citizen science on environmental citizenship, the review looks at the impacts of citizen science projects on young people in formal education. It considers how these are currently measured and the challenges facing schools when attempting to embed citizen science in education.

The challenges of science education for a complex future

Research into the decreasing popularity of science education (Day & Bryce, 2013) have highlighted three key challenges;

- Science education struggles with the competing goals of educating both citizens and future scientists
- There is low motivation among young people for the seemingly abstract and difficult nature of science education.
- The assessment approach adversely affects the experience of young people in science education.

Hodson (1998) suggested that students should; learn science, learn to do science and learn about science. Citizen science is by its very nature a participatory science. This can go some way to addressing the challenges of science education for a complex future.

Research Questions

Attempting to more deeply understand the opportunities and challenges posed by school-based citizen science projects, this research examines nine of these studies in detail to answer the following research questions:

- What are the pupil impacts measured in existing studies?
- What methodologies are used to understand these?
- What are the teacher barriers identified by existing research?

Findings

Pupil Impacts

Content Knowledge
Scientific Process Knowledge
Expectations
Engagement
Careers
Attitudes

Methodologies Used In CS Research

Pre and post tests
Surveys
Focus Groups
Story based approach
Student Journals

Teacher Barriers

Curricular relevance
Expertise
Budget
Support / partnership
Exam pressure
Interest
Safety
Timetable
Workload
Time

Questions Raised

For Citizen Science Research and Practice

Can Citizen Science projects more fully engage with the science curriculum?

Do / Can science teachers engage with Citizen Science educational research?

How can science teachers be supported to engage with Citizen Science? What is in it for them?

For Science Education Research and Practice

Does citizen science represent a 'radical departure' from existing science provision in schools?

When and how is it important for learners that they experience 'authentic' science?

Are teachers prepared to consider pupils as citizens?

Conclusions

Teachers are the gatekeepers for school-based citizen science projects, however the priorities of teachers diverge from those of citizen science projects. The gap in research into teacher experiences of citizen science should be addressed.

The citizen science community can and should do more to better understand teachers' priorities and pressures, alongside a more in-depth knowledge of the relevant curricula.

Addressing practical issues such as budgets and building effective partnerships to support teachers will enable the citizen science community to work in a more collaborative way with schools.

Advanced Higher pupils studying invertebrate taxonomy



Selected References
Bomblough, R. (2000) From Citizen Scientists to Engineers *Journal of professional issues in engineering education and practice*, 126 (2). Day, S. & Bryce, T. (2013) Curriculum for Excellence Science: Vision or Confusion? *Scottish Educational Review*, 45 (1), 53-67. Hiller, S. E., and Kitsantas, A. (2014) The Effect of a Horseshoe Crab Citizen Science Program on Middle School Student Science Performance and STEM Career Motivation. *School Science and Mathematics*, 114(6), 302-311. Moss, D. M., Abrams, E. D. & Kull, J. A. (1998) Can We Be Scientists Too? Secondary Students' Perceptions of Scientific Research from a Project-Based Classroom *Journal of Science Education and Technology*, 7(2). Paige, K., Lawes, H., Matejic, P., Taylor, C., Stewart, V., Lloyd, D. & Daniels, C. et al. (2010). 'It felt like real science!': How Operation Maggie enriched my classroom. *Teaching Science*, 56(4), 25-33. Radhakrishna, S., Binoy, V. V. & Kurup, A. (2014) The culture of environmental education: insights from a citizen science experiment in India *Current Science*, 176 (2). Vitone, T., Stofor, K. A., Steinger, M. S., Hulcr, J., Dunn, R. & Lucky, A. (2016) School of Ants goes to college: integrating citizen science into the general education classroom increases engagement with science. *Journal of Science Communication* 15(01)