

Developing Students' Understanding of the Nature of Science via Citizen-Science  
Educational Projects

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**Abstract**

Citizen Science (CS) is a developing field in science and science education, bringing forth the collaboration of research institutes, organizations, and citizens. There are currently hundreds of research studies originating from various scientific institutes and universities from around the world that are being conducted in cooperation with citizen scientists. Students' participation in CS allows students to integrate their school learning about science with authentic experience in scientific research and thus can help them develop the habit of scientific practices and thought. The present study seeks to examine the impact of K-12 school students' (n=400) participation in CS projects on their understanding of the nature of science (NOS). The study examines students' understanding before and after their participation in the projects and compares different projects to understand their effectiveness in promoting students' understanding. The research tools used were pre- and post-questionnaires. The data analysis was performed using statistical tests (e.g., Wilcoxon Two-Sample analysis, Kruskal Wallis test). The results indicate a significant improvement in students' NOS understanding, which shifted from naïve conceptions to a more informed understanding in most of the examined NOS aspects. In addition, our analysis revealed three variables that may impact the differences in the change of understanding among students: type of NOS teaching (explicit/implicit), type of CS project (contributory/collaborative/co-created), and type of inquiry (structured/guided/open). The study contributes to our knowledge regarding students' understanding of NOS during their participation in CS, which will pave a pathway to further research in this field.