

# Systematic Literature Review: Learning Science Literacy through Citizen Science

Jean Paul Iyakaremye and Hui-Hui Wang, PhD.  
Agricultural Sciences Education and Communication Department, Purdue University

## Introduction

Empirical studies have highlighted the potential of citizen science

- To increase scientific literacy,
- To promote knowledge, and the understanding of scientific concepts and processes (Bonney et al. 2009).

**The purpose** of this study is to examine the educational citizen science projects trends over the past 20 years and their contribution to scientific literacy, emphasizing the instruments used for measurements.

## Problem Statement

- Bonney et al. (2016) found limited but growing evidence on citizen science projects participants' knowledge gain increase on both science content and process.

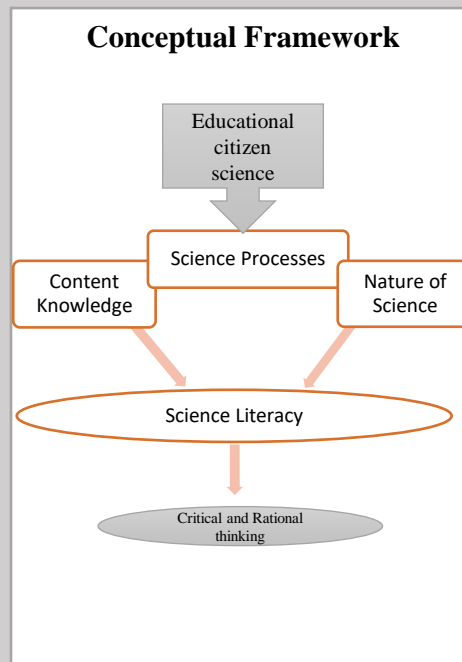
However, educational citizen science projects are yet to be evaluated extensively, especially;

- The educational citizen science projects trends over time.
- Their contribution to scientific literacy.
- Instruments used for Citizen Science projects measurements.

## Method

- Peer-reviewed and are published between 2000-2020
- Three keywords, Citizen Science, Science Literacy, and Education were used to search for articles.
- After initial title screening, we found 40 articles that at least have one of the keywords in the title.
- The authors read through the abstract and method to screen for inclusion.
- The codes included scientific process, going beyond science understanding, nature of science, science content knowledge, motivation, attitude, and awareness.

## Conceptual Framework



## Results

- ❖ The results show that researchers tend to use quantitative research method more than other methods in educational citizen science projects.
- ❖ Nearly 70% of all articles reported an increase in science process understanding.
- ❖ As for attitude toward science and science content knowledge, around 50% and 65% increase were reported, respectively.
- ❖ 21 articles used one or more instruments to measure one or more components of scientific literacy in 28 articles that fit our study.

## Conclusion and Implications

- The systematic analysis of articles considered for selection in this review showed huge growth in scholarship in this field from 2000 to 2020, especially over the past 6 years.
- The results showed an urgent need for developing an effective and reliable instrument to evaluate science literacy in citizen science project.
- We would like also to recommend future reviews to analyze publications on Educational citizen science projects in other settings such as books, and grant proposals.

## References

- Bonney, R., Ballard, H., Jordan, R., McCallie, E., Phillips, T., Shirk, J., and Wilderman, C. C. (2009). Public Participation in Scientific Research: Defining the Field and Assessing Its Potential for Informal Science Education. *A CAISE Inquiry Group Report: Center for Advancement of Informal Science Education (CAISE)*.
- Bonney, R., Phillips, T. B., Ballard, H. L., & Enck, J. W. (2016). Can citizen science enhance public understanding of science? *Public Understanding of Science*, 25(1), 2-16.