Science Learning via Participation in Citizen Science in the Zooniverse

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Most Recently Launched Projects (as of Friday 6th May):

- Western Shield – Camera Watch
- Microscopy Masters
- Poppin' Galaxy
- Wisconsin Wildlife Watch
- Snapshots at Sea
- Comet Hunters
- Jungle Rhythms
- Shakespeare's World
- Emigrant City
- Measuring the ANZACS
Astronomy related projects include:

- Galaxy Zoo
- Planet Hunters
- Sunspotter
- Planet Four
- Asteroid Zoo
- Radio Galaxy Zoo
- Disk Detective
- Science Gossip
- Planet Four: Terrains
- Comet Hunters
Science learning via participation in online citizen science

Karen Masters, Eun Young Oh, Joe Cox, Brooke Simmons, Chris Lintott, Gary Graham, Anita Greenhill and Kate Holmes

Masters et al. 2016 (JCOM)
Projects in “Science Learning” Investigation

GALAXY ZOO

PLANET HUNTERS

PENGUIN WATCH

SNAPSHOT SERENGETI

SEAFLOOR EXPLORER
User Survey

N=1921 responses across the 5 projects.

Survey sent to more of the “least engaged” users (who have a lower response rate) to result in better match to the distribution of engagement of all volunteers.
Volunteers self report that they are learning about science

(i) lets me learn through direct hands on experience of scientific research

(ii) allows me to gain a new perspective on scientific research

(iii) helps me learn about science

Figure 5. Survey responses of participants views on learning while participating in Zooniverse.

Science Quiz

\[ \frac{i \hbar}{\partial t} \Psi = \hat{H} \Psi \]
Project specific science knowledge correlates with active engagement
(but general science knowledge does not)

We fit an econometric correlation model of the form:

\[ K_i = \beta_0 + \beta_1 P_i + \sum_{j=2,n} \beta_j C_{ij} + \mu_i, \]

Science knowledge measured by quiz
Participation in Zooniverse (e.g. length of time, number of classifications)
Control variables (demographics known to affect science knowledge)

Doubling the number of active days spent classifying on project results in 8% improvement in quiz scores for project specific science.
Measures of Scientific and Public Engagement Success of Zooniverse Projects

Zooniverse projects that have successful public engagement always have high scientific output

Cox et al. 2015 (CiSE)
Most Zooniverse projects are broadly similar in the extent to which they lead to cost savings, with an average across projects of approximately 34 full-time working years saved due to the involvement of volunteers.

Cox et al. 2015)
How long volunteers stay engaged

Total number volunteers

Number of classification per person

Activity on blog, twitter, Talk discussion

Communication between volunteers and science team

Papers with citizen scientist authors

Collaboration, Communication, Interaction

Project appeal, Sustained engagement, Public contribution

(a)

(b)
Projects which rank higher in public engagement have higher correlation between science knowledge and participation.

Correlation co-efficient in the regression results

Ranking from Cox et al. 2015 analysis
Conclusions

“the best way to use citizen science projects to provide an environment that facilitates science learning is to provide an authentic science driven project, rather than to develop projects with solely educational aims.”