Instructor Instructions

Galaxy Zoo & The Power of the Crowd

Activity Overview:

In this activity, students will learn about the power of citizen science and crowdsourcing through classifying a small subset of galaxies based on their shape (morphology). They will be able to compare their galaxy classifications to those made by their fellow classmates, Zooniverse volunteers, and a computer programmed to classify galaxies. At the end of the activity the class will come back together as a group to discuss crowdsourcing, its benefits and shortcomings, and when students may utilize crowdsourced data to inform decisions as part of their daily lives.

Click to view the corresponding student worksheet for this activity

Estimated time:
30 minutes outside of class, 45 minutes in class; or 75 minutes in-class only.

Learning Objectives:

By the end of this activity students will;

1. Gain experience exploring galaxy classification in a realistic context
2. Understand the benefits of crowdsourcing through participation in a Galaxy Zoo-type project
3. Explain how crowdsourcing is a valid tool that can be used to help scientists complete complex tasks more efficiently
4. Apply their understanding of crowdsourcing to other broader contexts where they use crowdsourced data to inform decisions in their daily lives

Prerequisites:

Instructors: Before getting started with this activity, instructors must create a classroom on the classroom.zooniverse website. If you have not created a classroom at this point, check out the instructions! Make sure your classroom has been created, and all of your students have been added to your classroom before proceeding.

Students: Students must have their Zooniverse accounts setup and have joined your classroom. Ask students to verify this before coming to class.

Activity Instructions:

I. Introduction

NOTE: This part of the activity can be done outside of class if desired.

1. Have students visit http://www.zooniverse.org and sign in using their Zooniverse accounts
2. Provide students with the link to the project page for the Galaxy Zoo 101 Activity.
   a. You can get the correct link by clicking 'Copy Project Link' for Galaxy Zoo 101. This is the link you should send to your students via e-mail or your class CMS

3. Once students click that link, they can begin working on the activity
4. Notify students that they should see a green banner on top of the classification page that says "You are classifying as a student of your classroom"
   a. If they don't see the green banner, have them sign out and sign back in before revisiting the project link you provided
5. Remind students that they need to record their classifications in this google sheet, and that the galaxy ID can be found by clicking the 'info' icon underneath each galaxy image

II. Classification

1. Make sure students classify all 22 galaxies. If conducting Part I of the activity in class, this time can be used to walk around the class and check in on students
2. As students are making their classifications, verify in your classroom home area that student classifications are being logged. As students classify, the % completed will populate until 100% of the class has completed their classifications (as shown below):

3. Once all of the students have completed their classifications, request the data export and send to google sheets

   a. The export can take a few minutes to finish, be sure to check back frequently after requesting the export

      b. If for some reason the data does not export after a few minutes, you can use this [sample class data](#) to complete the activity

4. Once in google sheets, change the permissions of the data sheet to 'read only' by clicking the 'share' button in the upper right corner and choosing the appropriate setting
5. E-mail students the link to the results spreadsheet and have them make their own copy to their google drive

III. Quick Debrief

1. Ask students for feedback on the ease of the classification task
   a. What were the biggest challenges?
   b. Were there certain types of galaxies that were easier to classify than others?

IV. Galaxy Classification Results

1. Students can work on this section in small groups with neighboring students
2. Let students know that on average 30-50 people classified each galaxy in the original Galaxy Zoo project, and that volunteers who consistently disagree with the majority get down-weighted so their classifications do not count as much as those who continuously classify with the majority
3. Once students are finished with the analysis portion of the activity, discuss as a class the advantages and disadvantages of having a single astronomer classify hundreds of thousands of galaxies
4. Next, discuss the advantages and disadvantages of having members of the public do the same task online
5. Can students think of any other aspects of their life where they experience (or participate in) crowdsourced data?
   a. Yelp, online reviews, Netflix reviews etc…
6. Advertise other Zooniverse [projects](#) to demonstrate the diversity of fields where this approach can play a useful role