Final Product BSA 2018: Growing Quantitative Literacy Using Botany

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**Course/Course format:** BIOL 213 lecture and lab - plant biology

**Module:** Seed Dispersal in Tropical Forests: <https://qubeshub.org/publications/425/1> CC Attribution-NonCommercial-NoDerivatives 4.0 International [HHMI BioInteractive](https://qubeshub.org/groups/hhmibiointeractive) (2018). [**Seed Dispersal in Tropical Forests**](http://dx.doi.org/10.25334/Q4GH4C). [HHMI BioInteractive](https://qubeshub.org/groups/hhmibiointeractive), QUBES. [doi:10.25334/Q4GH4C](http://dx.doi.org/10.25334/Q4GH4C)

For the spring 2018 semester, I implemented the seed dispersal in tropical forests module into my sophomore level plant biology lecture course (BIOL 213). My main goal was to see how students responded to and learned from the module so I could then modify (if needed) for future class use.

1. Course LOs addressed by module:

Seed dispersal

* Understand, describe, and provide examples of the different types of symbiotic relationships involving botanicals (competition, mutualisms, commensalism, parasitism, herbivory)

1. Implementation of module

Seed Dispersal

Students watched the pre-class video in class (to ensure everyone watched). The activity not modified from its original form. This module came later in the semester, after we’d discussed seed dispersers and adaptations for abiotic vs. biotic vectors. Students had a good understanding of different ways a plant might be modified to suit certain pollinators and seed dispersers, but there wasn’t any actual data in the course material to help them visualize the importance of vector type on species dispersal and survival. I felt this activity would help reinforce material and wanted to see how it went ‘as is’ before making further modifications. Students worked in groups of 3-4 and we stopped at various points to discuss ideas for experiments and to make sure everyone was on the same page. I wish I had printed the handouts in color as I needed to project several graphs. We were able to complete parts 1 and 2 while in class. I assigned parts 3 and 4 as homework. I collected the worksheets to allow me to better understand where students understood concepts and which were confusing. Upon reflection, I wish I had time during the semester to call more attention to some areas as it explains some of the answers I received when I assessed their learning on the final exam.

1. Assessment of Module

Seed Dispersal

I asked a question directly from the activity (#20 Spider monkeys typically travel 100-400 m before depositing feces that contain seeds from several different species. Birds often travel 2-3 times that distance before depositing seeds. Use this information and your knowledge from the seed dispersal activity to make a prediction in the form of a graph for where you would expect to find seeds and seedlings from a monkey-dispersed fruit tree as a function of distance) on the course final exam. 8 students answered correctly (38% of the class), 11 students (52% of the class) received partial credit for having some correct information, and 2 (10% of the class) missed the point of the question.

1. Reflections on module and ideas for future use

Seed Dispersal

Students generally responded positively to this activity but were not thrilled to have additional homework when the activity wasn’t completed in the class period. To improve:

* Spend more time with the graphing activities as many students got the general idea, but the majority had significant inaccuracies with their answers on the final exam.
* Read and tie activity to the papers cited (Augspurger et al. 2016, Zhou & Chen 2010)) to provide more backstory/connection to current research.
* Perhaps find another location in the course (near reproduction topics) to create better synergy with course material (the activity may have suffered partially from end-of-the-semester stress/indifference from students).