

CHANGING STUDENT ATTITUDES ABOUT THE ENVIRONMENT USING INSECTS

A ROUNDTABLE PRESENTATION

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EXTENDED ABSTRACT

Undergraduate, non-biology majors may have preconceived notions about insects as annoying, harmful, or useless organisms. However, one learning goal of introductory biology is to help students understand that all organisms play an important role in their ecosystems. To accomplish this, we sought activities to help the students question their preconceived notions and expand their perspectives about environmental interactions. We chose two assignments -- one focused on bees and one on mosquitoes -- that were most likely to both engage students and encourage their critical reflection about their assumptions surrounding insects. Both scenarios that we introduced directly related those insects with humans and our environment, in an effort to gain student motivation to learn through relevancy (Himschoot, 2012). The end products for both assignments included reflection papers to encourage critical reflection about student changes in perspective. Students then received feedback from their instructor about their growth both through a rating assigned on a rubric and through written comments. The rubrics used were based on the Student Transformative Learning Record (STLR) rubrics in use at the University of Central Oklahoma.

For the “What about bees?” assignment, students watched a TED Talk about the disappearance of bees (Spivak, 2013) then answered both content questions and reflection questions (Table 1). For the “Mosquito Experiment,” students carried out a mosquito breeding experiment then submitted both a lab report and answers to reflective prompts (Table 1).

Table 1. Reflective prompts for both biology assignments

“What about bees?” reflective prompts	Mosquito Experiment reflective prompts
<ol style="list-style-type: none"> 1. Do you think there is anything else you can do to help bees (besides what was mentioned in the video)? If so what? If not, why not? 2. Did this video change your views about bees, agriculture, food production, scientists? Why did it change your views? If not what are your views and why? 3. Do you think most citizens are aware of the crisis bees are facing? Who is responsible for educating these citizens? Why? How? a. If you were the mayor of Edmond what might you do to help educate people about bees? What kind of laws might you write to help solve the problem of colony collapse disorder? 	<ol style="list-style-type: none"> 1. How can you use your data and the class data to positively affect public health? 2. Did this experiment follow the scientific method? How? Why or why not? 3. What would you change about the experiment if you were to do this a second time? 4. If you were the mayor of Edmond how might you approach the current lack of surveillance for mosquitoes carrying the Zika virus? 5. Describe an appropriate surveillance program for the city of Edmond to monitor for mosquitoes carrying the Zika virus. How is this related (or not) to the research we performed as a class?

<p>4. Why do you think environmental issues such as this one receive very little attention from the media and politicians?</p> <p>5. How might your attitude toward bees change if you lived in a foreign country?</p> <p>6. Describe your typical lunch. How do you think your typical lunch would change if bees disappeared?</p>	<p>6. If you were a research scientist trying to eradicate the Zika virus how might you approach the problem globally? Did you use anything you learned from the class research project to approach this problem?</p>
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Student artifacts were assessed both for a grade on the assignment and for their evidence of transformative growth in Health & Wellness (HW); Civic Engagement; and Research, Creative & Scholarly Activities. For example, the rubric for assigning levels of Transformation, Integration, or Exposure (ordered by decreasing levels of change) in the HW tenet for the bee assignment were:

Transformation: The student has completely changed his/her behavior to help bees in some meaningful way. They may be telling their friends about the effect of colony collapse disorder on environmental health (in person or through social media/blogs), starting a bee-friendly garden or hive, posting signs on campus about bees, changing their major or degree focus, getting involved with an environmental group etc. Look for the student taking action instead of just talking about action that needs to be taken. Integration: Student can discuss bees as a keystone species in the environment (how important they are to environmental and human health and why). The student mentions how they might change their behavior or choices to influence bees in his/her everyday life. He/she could also mention the importance of bees to humans' nutrition and how humans might be able to improve the bees' current situation. Exposure: Student discusses bees as an important part of the environment. There is no mention about the influence he/she has on bees in his/her everyday life.

These methods stem from a Transformative Learning perspective (Cranton, 2006), such that we sought to motivate students to learn, confront them with scenarios that would cause them to question their preexisting understanding of insects, give them opportunity to reflect on new perspectives they might develop, and provide feedback based on a standardized rubric (Bela et al., 2016). To replicate our setup, instructors should consider: selection of assignments to encourage transformation, the inclusion of critically reflective prompts for the students to give evidence of their perspective shifts, setting instructor expectations of student transformation level, and the development of a rubric for assessment.

SELECT REFERENCES

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