The formation of learning communities in Life Sciences (LSC) 101

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Introduction

First-year programs, increasingly common in undergraduate institutions, have positive consequences for the students and the institution as numerous studies have shown. In developing the Life Sciences First Year (LSFY) program, several goals were identified: engaging students early as active participants in the learning process, introducing critical and creative thinking standards, and retaining students in the major. In the Fall of 2014, all incoming life science students were required to take a course entitled Critical and Creative Thinking in the Life Sciences (LSC 101). The learning outcomes for this course related to four areas: (1) creative and creative thinking, (2) rhetoric of science, (3) nature and conduct of science, and (4) science of learning.

This course used a variety of approaches to learning, with case studies and extensive group work incorporated into each class. Students were required to solve problems, design experiments, interpret data and report as a cooperative team. A side benefit of this course would be the formation of learning communities, which have been shown to contribute to student success. Instructors noticed, through casual observations, that students appeared to be forming learning communities. In future semesters, more intentional measurements will begin to track the formation of these learning communities as we also measure student retention and success in the life sciences.

Sample Activity

Design a small scale experiment that will help assess and potentially provide a solution to a more global problem. Feel free to use the internet to gather data. You will need to consider feasibility, economics, ethics, social, and scientific issues. Consider drawing a concept map or other representation that might illustrate the problem and the multi-pronged solution.

A. How can we stop the spread of the Ebola virus?
B. How can we stop or minimize the effects of an invasive species (camel crickets, lion fish, or kudzu are examples but you can choose another)
C. How can we minimize the effects of the California drought?

At the designated time, fold your experimental design into a paper airplane and send it to another part of the room. Pick up a paper airplane from another group and critique it using at least 2 intellectual standards. We will discuss our solutions and critiques the following week.

Factors That May Foster Learning Communities

1. Learning outcomes that emphasize the goal of becoming active, engaged learners.
2. Introducing and having the students apply the standards of critical and creative thinking.
3. Creating opportunities for discussion including case studies, analyses of primary literature, data, and current information from a variety of sources.
4. Using a non-traditional classroom environment with flexibility to rearrange the furniture as needed. Small class size – LSC 101 sections are under 50 students.
5. Challenging students to be intentional learners as part of their transition to college.

Conclusion

At the end of the semester, LSYF students reported making new friends and half reported studying with each other and planning future courses together. The formation of such learning communities, if confirmed in future years, may be one positive outcome of the LSYF Program. Combined with critical and creative thinking standards, critical reflection, and increased opportunities for small classes and research-based learning, these learning communities should dramatically increase student success.

References