Improving Learning Despite Misconceptions
Using Concept Tests and Minute Papers to Improve Understanding

BACKGROUND

All students come into the college classroom with prior knowledge, which is defined as a combination of the learners’ preexisting attitudes, experiences, and knowledge [1]. This can be helpful or confound an educators’ best efforts to deliver ideas accurately. Some prior knowledge involves misconceptions, either from errors in textbooks to lack of uniformity in nomenclature [2]. If these misconceptions are not approached early in the course, they can persist even beyond college [3, 4]. Other sources of misconceptions stem from intuitive thinking to make sense of biological concepts. These are products of informal reasoning and anthropomorphistic, teleological, and essentialist thinking [5]. There are several ways to uncover common misconceptions in biology including Concept tests and minute papers, both of which will be tested in this project [2].

REDESIGNED COURSE

The course being redesigned is studio biology 2, or CBEN120, a second semester biology course. Two methods will be used to uncover students’ misconceptions. The first is a concept test. This is a single multiple-choice question with one right answer, one common misconception, and three wrong answers. The student’s will have read the chapter before coming to class. The concept test will be given at the start of class. If most students get the question correct, the class will move forward. If many students choose the common misconception, they will then discuss the question in small groups of three students. The question will be asked again. If the misconception is still chosen, the instructor will lead a discussion to correct the misconception. Minute papers are done at the end of class and consists of asking the students if anything in the lecture topic was unclear. These areas will be discussed again in the next class.

INTENDED OUTCOMES

It is thought that by exposing misconceptions and faulty thinking at the introduction of each topic, a better understanding of the topic will follow. Addressing any further unclear ideas in the topic after the lecture in the next class will prevent informal thinking from being set up in the students’ mind.

ASSESSMENT

The final assessment for this trial will be the scores on the unit exams. These will be compared to the scores from the previous two semesters, where concept tests and minute papers were not done, to determine if there is a difference.

References