Wright College Academic Department/Program Assessment project
Fall 2015

What?

The biology department assessed critical thinking as part of a program of evaluating our student learning outcomes (SLO's) in the larger context of the Colleges educational mission. The initial goal of this specific project was to establish and analyze baseline data about our students' critical thinking skills.

Why?

The biology department is examining how well our department SLO's link with the College SLO's. We began in Fall 2014 by examining critical thinking. Prior to this project we did not have a department-wide critical thinking assessment or data that examined critical thinking in our student population. By establishing a baseline of where our students are in developing their critical thinking skill we hoped to judge the effectiveness of our activities in developing critical thinking across various biology classes, and then develop and test new initiatives.

How?

All full-time faculty met to discuss what we considered critical thinking in regards to biology, and to design the format of our critical thinking assessment. Our department agreed upon a common definition of critical thinking as the ability to take information about a subject, identify key factors, and arrive at proper conclusions. All full-time and adjunct faculty administered a 30-minute assessment in Bio 114, Bio 121, Bio 226, and Bio 227. Departmental faculty created critical thinking questions from which five were selected. This test was administered in week 12 of both Fall 2014 and Spring 2015 and the data collected and analyzed shortly afterwards. After each assessment was administered the data was analyzed and the results can be shown below.

What we found and what changes we are implementing.

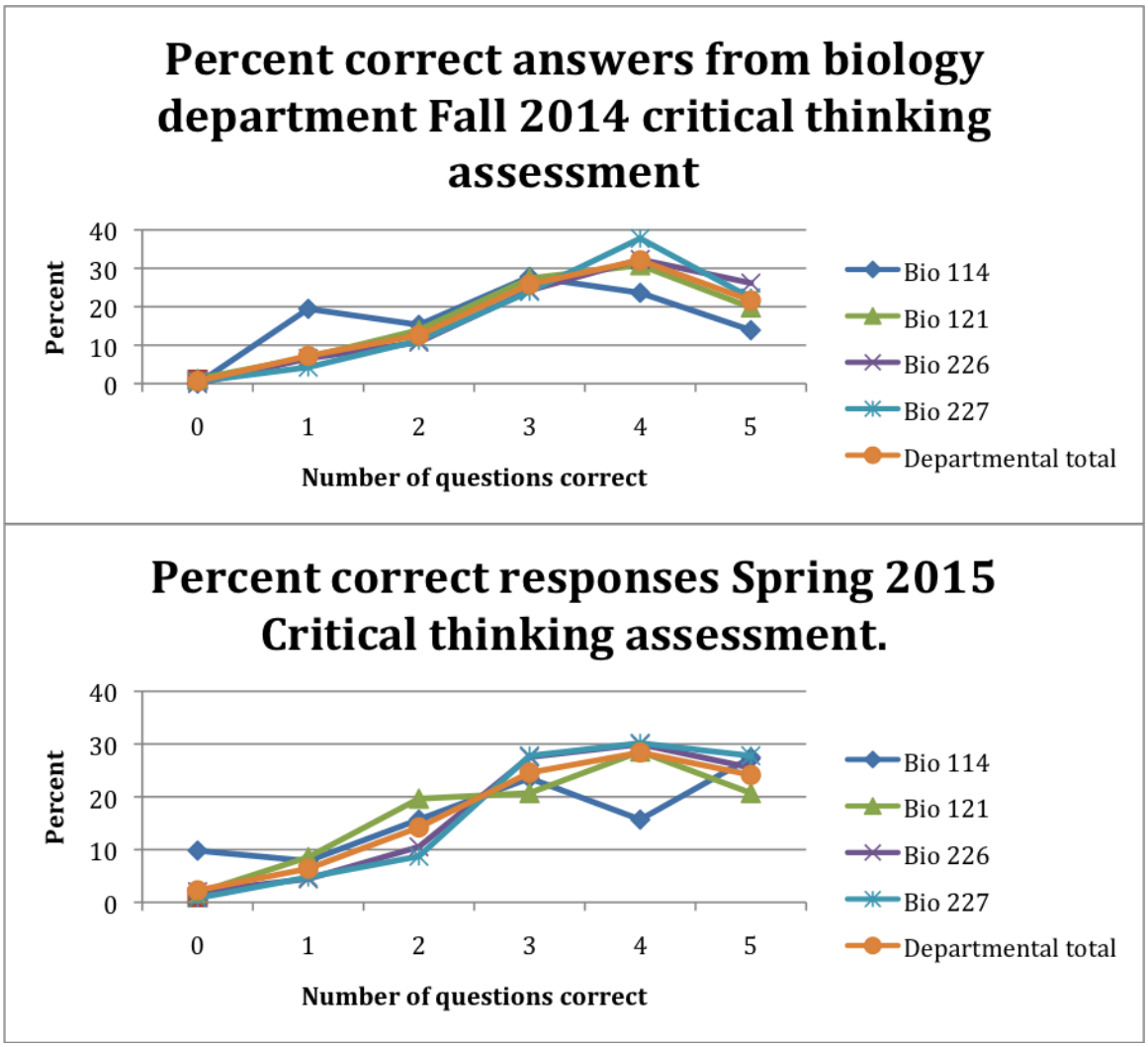
What we found

A total of 37 classes and 929 students participated in this initial critical thinking assessment in Fall 2014, and in Spring 2015 a total of 37 classes and 704 students participated.

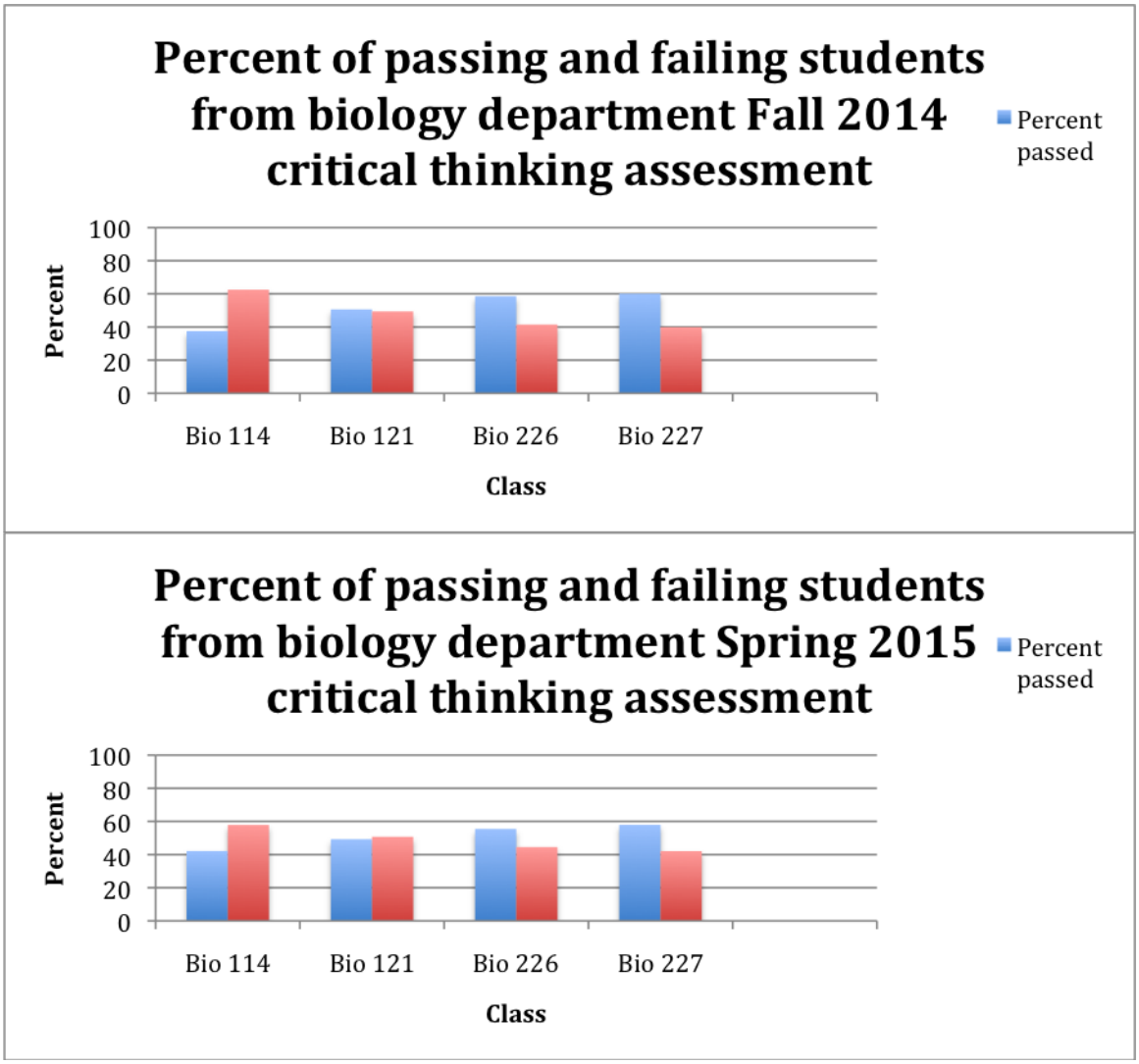
We found that across the department 53% of our students passed the evaluation in both semesters (A pass was considered a grade of 80% and above) and this held true in both semesters.

In both semesters, on a percent basis, more students struggled with the assessment in Bio 114 (a non-majors course) with a higer percentage of students only getting one question correct in the fall semester, or none at all in the spring semester. For

our Biology Majors classes (Bio 121, 226, and 227), percentage rates were more similar to each other (see below).



When considering specific classes a majority of students in Bio 114 failed the assessment in the fall semester (62.5% failed vs. 37.5% passed) and the spring semester (58% vs. 42%). In Bio 121 50.6% passed in the fall and 49.2% passed in the spring, in Bio 226 58.5% passed in the fall and 55.4% passed in the spring, and in Bio 227 60.1% of students passed the assessment in the fall and 57.9% passed in the spring (see below).



We met as a department in September 2015 and discussed the ramifications of these results. While there was an increase in critical thinking skills from introductory biology to higher level biology courses, this could be due to either an actually development of critical thinking skills, or merely that students with poor critical thinking skills were not successfully moving on their course progressions. After discussion we realized that we did not have a strong culture of assessment in our department and unless we kept repeating this specific critical thinking assessment again and again, which would take away from instructional time as currently delivered, we would not be able to accurately measure the effectiveness of our interventions nor would we be able to conduct any long term studies.

Therefore, what we chose to do was to reformat our final exams in all biology courses and designate questions that assess critical thinking skills. At the end of each semester, each section will have an item analysis performed on their critical thinking assessment questions and these data will be analyzed across each course offering. The benefits of this

approach are many. To begin with we can tailor each critical thinking assessment to each class; for example the materials taught in Bio 119 (Ecology) are different from Bot 201 (Introduction Botany) and a one size fits all assessment is not appropriate. Each assessment can be run essentially behind the scenes without taking valuable class time away from teaching (Our long term goal is expand this approach to our other College SLO's for the same reason). Because we will be collecting data every semester we can fully assess how interventions are working, and can even experiment with different interventions in different classes to see if certain ones are more effective. Finally, by having our exams set up to assesses critical thinking on a continuous basis we will create a long-term culture of self-reflection in our department.