Evolution across the biology curriculum at UWL: Departmental initiation and implementation process

The setting
- University of Wisconsin-La Crosse
- 10,227 students; 1,100 biology majors
- Departmental content assessment takes place in the Biology capstone class.
- The Biology core curriculum is required of all biology majors and consists of: General Biology, Plant, Animal, or Organismal Biology, Genetics, Ecology, Cell Biology, and Capstone. Human Anatomy & Physiology I & II are also taken by almost all biology majors and were also included.

Our approach
- We tried to include all members of the biology department at every step of the process.
- We asked for their current teaching practice and to recommend to us what concepts would fit most logically in their classes.
- At each stage, EvoC members met with their core constituency and the committee reported our progress to the department.

Graduating seniors were answering ~60% of evolution questions correctly on their exit exam.

Student performance below our expectations

Formed ad hoc departmental committee

Surveyed biology faculty

Curriculum improvement grant funded

Wrote teaching modules & assessments

Tested new modules & assessments

Revised modules and assessments

Tested again and launched throughout Core.

We began with a 2 day workshop with the primary goal of producing student-centered teaching modules and assessments for 3 concepts for General Biology.

Workshop topics:
1. Intro. to student-centered learning.
2. Student conceptual difficulties with Evolution.

For the rest of the summer we met every 2 weeks to present the modules we had developed and revise with EvoC member’s feedback.

The EvoC wrote a curriculum improvement grant to spend a year developing teaching modules and assessments to improve evolution instruction in the biology core classes.

In all core courses each student took pre and post assessments on the targeted core concepts. In these courses, some sections included newly developed modules (experimental), while others remained the same (controls).

We examined student’s scores both pre and post course, as well as control vs treatment. Some modules had satisfactory learning gains, these were retained and rolled out in all course sections. Other modules were revised and underwent another round of testing. Assessment questions were examined for suitable difficulty and discrimination scores. Unsuitable questions were revised and re-tested, questions with good scores were retained for data collection.

This Fall, the new evolution teaching modules will be taught in all core courses, except Ecology, where the modules are not performing satisfactorily. We will continue to track any change in evolution content knowledge over the curriculum for the next 4 years.

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