Mid-level Assessment of an Introductory Biology Course

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Acknowledgements

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Background

Change in pedagogy beginning with the Fall 1998 semester.

- Emphasis on inquiry-based approach to learning biology
  - departure from expository lectures

Teaching Style

Beginning Fall 98

3 courses replaced with 1 mixed-majors course (1114-new)

Biological concepts integrated from the sub-cellular to the ecological

Inquiry-based/ collaborative learning in both lecture and lab

The Labs

Inquiry Style

- **We present a general question**
- **Students propose hypotheses and design and conduct experiments**
- **Students conduct pre-labs and submit planning forms**

So--is the new method better?

We compared the attitude toward biology and content knowledge of students entering mid-level zoology courses who completed the "new" introductory biology course to students in the same set of upper-divison courses who did not take the course.

Method-Assessment Instruments

Attitude Assessment

- Biology Attitude Scale
  - Russell and Hollander, 1975
  - 14-item Likert-type scale

Content Knowledge Assessment

- NABT/NSTA High School Biology Exam
  - We used 40 of 80 items for survey of new style and old style introductory course
  - Of those we used 6 items from the NABT/NSTA exam and 4 items from the new course final exam for the mid-level assessment.

Methods-Timeline

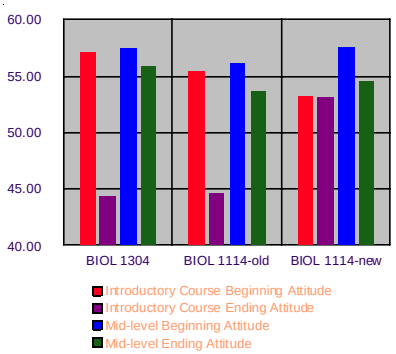
We compared the effect of the three courses by looking at the changes in attitude and content knowledge scores between pairs of survey times.

- 1- Beginning and end of introductory course
- 2-End of introductory course and beginning of the mid-level study
- 3-Beginning and end of the mid-level study

Methods-Statistical Analyses

We analyzed the results of the Biology Attitude Scale measurements and the Content Knowledge questions using MANOVA. We report probabilities based on Wilk's Lambda. If the overall comparison of courses was significant, we performed pair-wise comparisons.

Attitude of students at beginning and end of entry-level and mid-level life science courses.



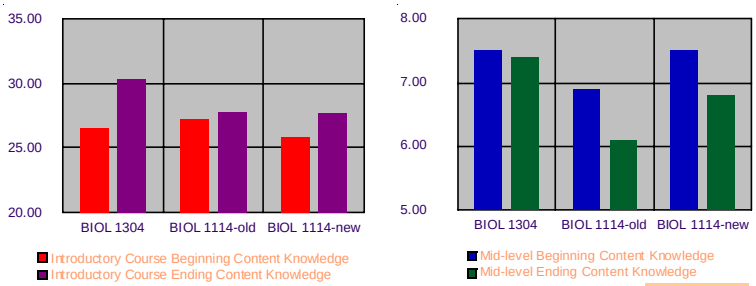
Findings-Changes in Attitude

Compared to students who took the new course:

- Students taking either of the previous introductory courses had a significantly negative change in attitude during their introductory semester.
- This change in attitude difference disappeared by the time the students began the first semester in which they completed the mid-level survey.

There were no significant changes in attitude during their mid-level courses.

Beginning and Ending Introductory Course Content Knowledge Scores



Changes in Content Knowledge

No significant difference in change in content knowledge scores during the mid-level study.

Discussion

No decline in attitude toward biology by majors enrolled in the new course.

- Attitude scores of students in the old course recovered by the beginning of the mid-level study

Discussion

Changes in Content Knowledge

- New course adequately prepares students for upper division classes
- May do a better job at increasing student understanding of the process of science