

Introducing recitation in a large introductory biology course at Howard University

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Abstract

General Biology 101 is designed to provide basic explanations of fundamental principles of biology and present an appreciation of the investigative nature of living organisms. Biology 101 at Howard University is a core requirement for all biology majors (and often non-majors at the university) and has a total enrollment of approximately 350-400 students each semester. Data compiled from previous classes demonstrated that this course had a high attrition rate compounded by poor grade distribution.

During the spring semester 2009, we tested the hypothesis that an introduction of a recitation period, would allow for small group learning and potentially lead to decreased attrition as well as a better overall grade distribution. A half-hour recitation was introduced in one section of the course while another section was designated the control. At the end of the semester grade distribution and attrition from the control and experimental sections were compared. The comparative data clearly demonstrated that students in the experimental group had better grades and a lower attrition rate when compared to the control. Moreover, a recitation seems to benefit students in more ways than just improving grades, but provides a mechanism for active learning. Our report also shares many lessons learned during the implementation of the project, which can serve to help not only faculty, but students understand cooperative learning environments.

Rationale

Recitation in large class sizes with one instructor provides students with an opportunity to review lecture material in more detail, specifically for math and science courses. It also allows for greater interaction with the instructor and facilitates small group learning activities.

For this pilot study, we introduced recitation during spring 2009 to General Biology 101 to address specific questions from students in a smaller classroom environment to:

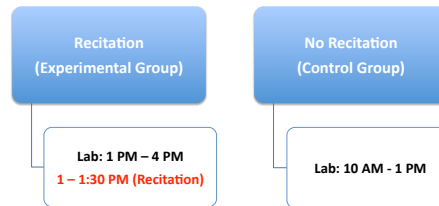
- ➡ Improve student learning and grades
- ➡ Decrease overall attrition rate for this class

Overview of themes and concepts in General Biology 101

- Atoms & Molecules
- Cells
- Membranes
- Cell Respiration
- Photosynthesis
- Cell Division
- Genetics
- Replication, Transcription, Translation
- Cell Communication
- Immunology

Implementation

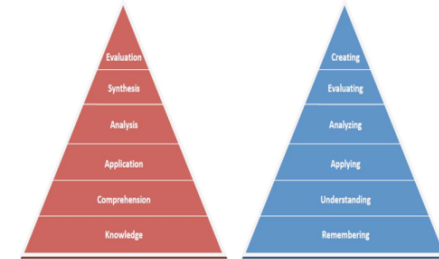
- All students attended the same lecture and one of two lab sections taught by the same Teaching Assistant
- Recitation was conducted using published best practices for teaching and learning
- **Recitation** topics centered around the lecture material covered each week



Hypothesis: Students will benefit from experiencing peer led teaching and learning during recitation resulting in a decrease in the attrition rate and increased retention and comprehension as measured by improved performance on exams.

Conclusions

- Students in the experimental group had the lowest attrition rate when compared to the control group
- Students benefit from peer led teaching and learning through recitation
- The only letter grade "A" in the course was from a student in the experimental group (with recitation)
- Students in the experimental group were more engaged in laboratory exercises compared to the control section
- The small group discussions led to increased comprehension measured by enhanced performance corresponding to knowledge acquisition according to Bloom's Taxonomy of Learning



Results

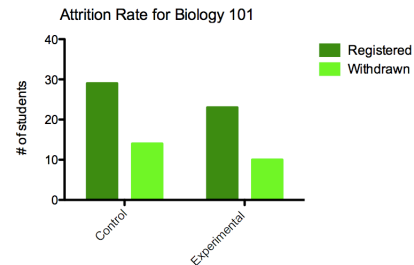


Figure 1: Spring 2009 student enrollment and attrition for Biology 101. There were 52 students officially registered for the course and divided into one of two labs, which are designated as control and experimental groups for recitation.

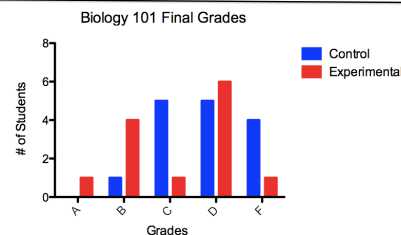
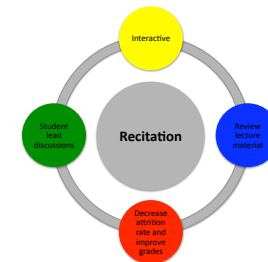


Figure 2: Spring 2009 student grade distribution comparing those involved in recitation (experimental) and no recitation (control)

Future Directions

Amendments were made to the syllabus, which affected the initial set schedule of recitation:

- Compare spring 2009 with other sections offered in previous semesters
- Increase time frame of thirty minutes to review more lecture material and answer all questions
- Assess individual student study habits



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