Beautiful Idea:

Bridging the Gap in Biology: Improving Knowledge Retention & Academic Persistence

Co-Developers:

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Project Description:

This proposed project will develop an integrated biology self-study system that will improve student preparation, understanding, and knowledge retention in the two-course sequence of BIO 230-BIO 240. Briefly put, this project will provide resources to bridge the gap in student preparation prior to entry into BIO 230 and 240, during each course, and after each course ends. The central mechanism of this system will involve electronic resources, including Blackboard, videos and animations, podcasts, and self-test quizzes.

The impetus for this project derives from my empirical observation, as well as that of my colleagues in the Hostos Natural Sciences Department, that:

(a) many students begin their science courses without a basic science skill-set, and

(b) many students have difficulty retaining the knowledge that is learned in each science class.

These students are less likely to succeed in each course of the important three-course sequence of Anatomy/Physiology I (BIO 230), Anatomy/Physiology II (BIO 240), and Microbiology (BIO 310). As a result, these students are less likely to succeed in their career aspirations, and are therefore less likely to remain at Hostos or even to continue at another college.

The self-study system that will ultimately be developed by this project will provide students in these three courses with a basic 'portfolio' of concepts and content that they can access prior to, during, and after finishing each course. The study tools will be easily accessible either within Blackboard or from the Department’s webpage.

Because there are many facets to the problem, its solution will also be many-faceted, and the biology self-study system could be used simultaneously with other methodologies and initiatives, including tutoring, learning communities, and ePortfolios.

This proposed project builds upon an earlier COBI project, “Student-made Science Videos” (an active learning and group-work exercise which I have successfully implemented in my Anatomy and Physiology classes for the past three semesters). The present proposal involves instructor-prepared resources—including videos and animations, podcasts, and self-test quizzes—that will be available for all students, and will be designed to “Bridge-the-Gap” in the 3-course A&P/Microbiology sequence.

Goals & Anticipated Outcomes

The goal of this project is to create a set of biology self-study tools formulated specifically for Hostos students and their coursework. The underlying goal of the project is to enhance student skills in scientific reasoning and academic literacy by emphasizing key scientific concepts and content.

It is anticipated that this self-study system will improve student knowledge and retention. First, it will help students improve their conceptual and factual knowledge-base prior to starting their biology courses. Second, it will help students retain knowledge of their coursework in the midst of their biology courses. Third, students will be able to retain the information from each course by reviewing the course information after each biology course ends. Fourth, students will be better prepared for the next course in the sequence, as well as for their professional studies.

It is also anticipated that implementation of this integrated study system will facilitate academic success and academic persistence.
Support in the Literature


Timeline

(September 2010): Map out main concepts and knowledge that will need to be covered in the self-study system. Discuss these points, and fine-tune, in consultation and conversation with colleagues in the Department.

(October 2010): Create and/or assemble self-study system components for preparatory study prior to taking BIO 230. This will include foundational material helpful for students embarking on a study of Anatomy and Physiology, e.g., including concepts/content on medical terminology, the cell, structure of the atom, organ systems of the body.

(November 2010): Create and/or assemble self-study system components for the within-course study of BIO 230. This will include material from each major topic in the course, but covering only the main concepts/content, and in an overview fashion.

(December 2010): Create and/or assemble self-study system components for the post-course review of BIO 230, and preparatory study prior to taking BIO 240. This will include material deemed most helpful for students who will be taking BIO 240.

(January 2011): Begin implementing the self-study system online and/or on Blackboard.

(Spring 2011 +beyond): Continue developing the self-study system to include modules for the within-course study of BIO 240. Begin the plan modules for the post-course review of BIO 240, and preparatory study prior to taking BIO 310.