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Hands-on Labs (HOL): Using Technology and Web-Based Resources to Transform a Traditional Lab-Based Biology Course into a Distance Learning (DL) Hybrid Course, across schools at Pace University.

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Title of Project: Hands-on Labs (HOL): Using Technology and Web-Based Resources to Transform a Traditional Lab-Based Biology Course into a Distance Learning (DL) Hybrid Course, across schools at Pace University.

Thinkfinity Grant Cornerstone: III

Principal investigators:

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Date: May 18, 2011

Mid-Project Reports

A) Please outline your original goals

- Incorporating the internet is compatible with student comfort levels and has become a preferred tool of learning
- Studies show that students understand and retain more information when they are given the opportunity to take ownership of their learning and become personally involved with the learning process
- The academic landscape is changing to accommodate technology and web-based resources
- address the dynamic learning environment with an increased awareness that students also have to deal with scheduling conflicts and circumstances
- transition this science foundation course into a completely HOL online learning system
- using the Labpaq system, we are able to offer our students the experience of a hands-on lab with the convenience of DL
- alleviating scheduling conflicts that arise due to heavily used laboratory classrooms
- offer full-time faculty flexibility in terms of teaching options
- address how we teach science and how students learn

B) What progress have you made towards your original goals on your project to date?

We have:

- developed and administered post-survey for BIO 123 Fall 2010 students to serve as a pilot
    - secured IRB approval for all administer surveys
- analyzed preliminary data from Fall 2010 pilot post-survey
- gathered samples of students lab reports from Fall 201
    - Secured student permission beforehand
- set up a designated HOL section of BIO 123 for the Fall 2011
- developed pre and post-surveys for the HOL section in Fall 2011
- scheduled to present at the Faculty Institute, May 25, 2011

C) Has your project impacted students? If so, how many?

- The pilot Fall 2010 BIO 123 class resulted in eleven (11) students (out of 11 enrolled) returning the post-survey. The next scheduled HOL section will be Fall 2011 and allow us to add a maximum of twenty (20) additional students to the HOL data set.
- We plan to also administer a competency questionnaire to both the HOL students and the two (2) sections of BIO 123 that will be have traditional labs so that we can assess the impact of HOL vs. an in-class lab experience. The HOL section will have twenty (20) students and the traditional labs will have forty (40) students for a total of an additional 60 students that will be impacted.
- Therefore, we have impacted eleven (11) thus far (Fall 2010) and will potentially impact another sixty (60) in the Fall 2011.
- An example as to how the eleven (11) have been impacted, survey questions included asking the students to rate on a scale of 1-5 the organization and presentation of the course material and their understanding of basic concepts covered in the course. The majority of students (60+%) responded that they agree or strongly agree the course organization and presentation helped their understanding of basic concepts.

D) Has your project impact other faculty members? If so, how many?

- BIO 123 is a non-major lab-based course taught each fall semester. The department generally offers three (3) sections of both lecture and lab with the potential for 6 different faculty.
- During Fall 2010 there were three (3) sections of BIO 123: One lecture and traditional lab was taught during the day by a full-time faculty member, the second lecture and traditional lab was taught in the evening by an adjunct faculty member, and the third section I taught as a on-line HOL hybrid course.
- Fall 2011: I am scheduled to again offer students an on-line HOL hybrid course and the other two sections have been tentatively scheduled with (the same) adjunct faculty member from the Fall 2010. This will help with consistency in teaching styles in terms presentation of material.

- At this point, since the other faculty members involved with BIO 123 have been responsible for the traditional lecture and lab sections, I am the only one that has been directly affected.

E) What are your next steps?

- We are going to incorporate student-feedback from the pilot study into the Fall 2011 section of BIO 123. For example, students wanted more clearly presented the amount of time each experiment would take them; almost all eleven (11) students were enthusiastic about the DNA lab but almost all did not care for the macrobiome lab. Based on this, we will select another lab that teaches the same concepts and lab skills.
- We will develop and administer the aforementioned competency questionnaire to both the HOL students and the two (2) sections of BIO 123 that will be have traditional labs so that we can assess the impact of HOL vs. an in-class lab experience. We will seek IRB approval in order to do this. We will administer the same questionnaire in September (class 1) and in December (after the last class) in order to determine how learning has progressed over the course of the semester.
- We will develop a pre-lab survey to administer in September to compliment the already approved and (Fall 2010) administered post-survey.
- Continue to review data from both traditional and on-line sections and perform longitudinal data analysis.
- Review student lab reports and do a more comprehensive analysis of work
- Design and implement a comprehensive rubric for lab reports turned in for grade so that all work is reviewed against the same set of standards