Title:

Statistics and the Sustainability Revolution

Applicant:

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Abstract-Statistics and the Sustainability Revolution

Statistics is arguably the most relevant and real world applicable mathematics course. Literally, every example is based on some set of data. The type of data and theme of a statistics course can vary greatly. Some institutions even have special names for their statistics courses. There is business statistics, bio-statistics and of course statistics for stem majors. At Bunker Hill, we offer a general statistics course, MAT 181, which covers a broad range of mathematical topics which is well suited for transferability for our students. Statistics and the Sustainability Revolution (SSR) would be a nationwide first of its kind; it would be an online statistics course primarily based on the theme of sustainability. I would work closely with the Bunker Hill Office of Sustainability to obtain the most up-to-date data on many of the modern issues in creating a more climate neutral college, state and nation. Students taking this course would organize and utilize this data to determine the impact they have as individuals and as a part of society on the environment. After taking this course, students will be able to make educated decisions and predictions using the tools of statistics. This course can support future initiatives by the college such as forming a sustainability certificate or degree program while simultaneously meeting all the current MAT 181 objectives.

Significance

This project has significant connections to each of the goals set out by Bunker Hill's Climate Committee:

1. **Evaluate and recommend policies for developing action plans (e.g. reduce energy consumption) to reduce greenhouse gases.**
2. **Evaluate measures that we can take to achieve no net greenhouse gas emissions.**
3. **Evaluate and recommend tangible action plans (e.g. only purchase energy star rated appliances) to be taken by BHCC to reduce greenhouse gases.**
   Evaluation of new policies, such as energy consumption, can be done using hypothesis testing. Hypothesis testing in this case would determine whether the alternative changes we are making in energy consumption at the college are statistically significant. Our students enrolled in this course would get real world application of the material they are learning and how it impact themselves and their school.
4. **Evaluate and recommend measures to integrate sustainability into the curriculum and make it part of the educational experience.**
   This course strongly exemplifies how sustainability can be made a fun part of the curriculum for students. Students will be learning statics through the modern challenge facing our environment.
5. **Act as the liaison between the college community and the President and between the President and the Nationwide Council on ACUPCC matters.**
   The college community is mostly comprised of students. By offering this course, we will be making connections between student's and the college community and the sustainability goals of our college. Once a "cool course" is known by student's, it has a tendency to become popular quickly.

Project Plan

Participants:

Professor Christopher Watson will be SSR project coordinator and course developer.

Director of Sustainability Paul Wolff will provide key examples to incorporate into the online course.

Dean of Weekend and Online College Bill Sakamoto will put the course online.

Overview:

The methods used to create this course will be similar to those I have used while developing several other online classes. I will include the examples provided by Paul to create an interactive webpage. Each course objective of MAT 181 will be done using a short video embedded in the webpage. The webpage will contain step-by-step mathematical details and follow up questions for the student to answer. The answers to student questions will also be given in the form of short videos embedded in the webpage. This online teaching method has helped me achieve success rates in online courses similar to and in some cases above the success rates in traditionally taught classes. One section of this course will run in Spring 2011 and continue through the upcoming semesters. Initially, one section will be offered with a total of 22 students enrolled. However, once created, this course can be taught year round and other sections can be added without additional labor. The software will be provided by the e-college. The purpose of the mini-grant application is to help pay for the resource of my time in creating this course.

Timeline:

December 2010: Gather data and examples to be incorporated into the course. Begin writing webpage for SSR course.

January 2010: Finish writing webpage and create videos for course. Submit entirety of work for beginning Spring 2011 semester. The course will run spring 2011.

Enhancement of Student Outcomes

Giving students' the opportunity to learn how they can make a real world difference in their community and back it up with mathematics is empowering! Student learning outcomes will be enhanced by giving them relevant and critical problems in which to engage. This course will promote awareness about sustainability through the students in the class and their peers, friends and families. I will create a whole new base of problems for this course however, all the course objectives of MAT 181 will be met.

Online courses are not just the wave of the future but are the greenest of courses as well. They require less paper, gas for travel and building space to maintain. Online teaching makes even more sense at Bunker Hill because of our growing space issue.

I have taught the prerequisite course for MAT 181 (MAT 094) online for three years now. Last spring, I won a state recognition for teaching the MAT 094 online. I currently teach 3 online sections of MAT 094 per semester. This project would offer these students an online college level follow up.

As a recipient of the Bill and Melinda Gates GSCC grant, I specialize in teaching of upper developmental and beginning college level mathematics courses. I have also developed a total of three online courses (Calculus I, Calculus II and Introductory Algebra) as well as an online Accuplacer tutorial. Creating text, videos and an interactive website is a huge undertaking. Casting our MAT 181 course in a sustainable mold adds significantly to the task of creating an online course. It is for this reason, I ask for mini-grant support in completing this project.

Statement on Assessment Plan

The assessment of the project will take two forms. One will be a measure of the success rate of this course. The other assessment will be in the form of an ongoing student survey that will be conducted at the end of each semester. This survey will poll student as to their attitudes, beliefs and roles in creating a more climate neutral society.

Budget Worksheet

This project will be will take roughly four-forty hour weeks to complete. The final result will include a 60-80 page website, with 150-200 videos and quizzes. There will be not one but over a hundred examples under the umbrella of sustainability incorporated into this course. I request $2,500.00 ($25/example x 100 examples) for the research and development time and to incorporate these examples into a course website.