

Project Summary

Collaborative Project - First Person Physics:

Wooing the Second Tier

a proof of concept proposal

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Reform movements in physics education have shown the advantage of active methods in lively applications for improving students' conceptual understandings. Research has shown that the learning of diverse groups of students is enhanced by the use of multimedia. Intrinsically motivating instruction is based upon meaningful story lines and contexts that bring personal relevance to the topic students are studying. This project proposes to bring all of these insights together with a human-body-centric approach to transform introductory, conceptual physics courses. This project will result in a two sample course modules, including a CD-ROM of video and numerical data for the study of human motions, and background physics notes that can be used in a wide variety of institutional settings to offer human-body-centric introductory physics courses for diverse student audiences. In addition to the human-body-centric approach combined with human-based apparatus and multimedia, the interactive learning methods encouraged by these materials will be especially helpful to enable the students to learn by methods of inquiry.

The project staff at the University of Nebraska - Lincoln, California State University Sacramento, and New Hampshire Community Technical College will develop two human-body-centric modules, *How Do I Move?* and *How Do I See?*, for introductory, conceptual physics courses. These modules will be field-tested and assessed under the direction of the Evaluation Team. The project will begin in May 2005 with incorporation of sample materials based on the revision of the *Humanized Physics Project* modules {www.doane.edu/hpp}. Materials developed at each institution will be field-tested at the other cooperating institutions and tested materials will be available for commercial distribution. By the spring of 2007, two complete human-body-centric introductory, conceptual physics course modules supported by interactive multimedia and quantitative reasoning activities will be available for use by other educators. The use of these materials for the learning of conceptual physics concepts by inquiry methods will be advocated. The appropriateness of human-body-centric modules for the wide range of students in introductory physics courses will be demonstrated.

- **Intellectual Merit:** This project seeks to demonstrate that fascinating, intrinsically motivating human-body centric applications of physics can entice second tier students in introductory physics and physical science courses to give science, technology, engineering and mathematics (STEM) careers a second look by enrolling in additional STEM courses in college.
- **Broader Impacts:** This project seeks to infuse the idea of fascinating, intrinsically motivating human-body centric applications of science into other introductory college science courses and eventually also into the science courses taught in secondary schools.