

**Professional Development Grant
Using Research-Based Curricula in Physics Instruction (Chautauqua courses).**

A. Title Page

B. Restatement of problem researched or creative activity

The course PHYS 3042 (Intermediate Physics Laboratory) is a recent addition to the Physical Science/Earth Science Education bachelor's degree. This course aims at "expanding and refining essential content and laboratory skills [of preservice science teachers] through modeling and experimental investigation of topics in classical and modern physics" (Tech Catalog). This course was expected to be taught for the first time in the Fall Semester, 2007. In order to provide students with the most current research-based curricula and activities in physics education, it was my responsibility to receive the appropriate training through two Chautauqua courses: *Using Research Based Curricula and Tools to Promote Active Learning in Introductory Courses, Parts I and II*.

C. Brief review of the research procedure utilized

This was not a research project. I attended both Chautauqua courses during the summer of 2006. The first course was scheduled for June 4-6, 2006. During this course, an overview of several activity-based introductory physics curricula for first semester topics was presented through *Modeling*, using microcomputer-based labs, Video Data, and the *Physics Suite (Tools for Scientific Thinking, Workshop Physics, Real-Time Physics, and Interactive Lecture Demos)*. Specifically, we completed several instructional experiences in kinematics, dynamics, heat and thermodynamics.

The second course was scheduled for June 10-12, 2006. During this course I was introduced to additional activity-based introductory physics curricula for second semester topics, *Modeling* using microcomputer-based labs and Video Data, and the *Physics Suite* (*Tools for Scientific Thinking, Workshop Physics, Real-Time Physics, and Interactive Lecture Demos*). Specifically, we completed several instructional experiences in electric circuits, static electricity and magnetism, light and optics, waves and sound, advanced video analysis.

D. Summary of findings

The main purpose of the training was for me to become proficient in several physics education curricula emphasizing mechanics, heat, and thermodynamics (Course I) and electricity, magnetism, oscillations, waves, light, and optics (Course II). I was fortunate enough to work with several hands-on equipment pieces for introductory physics that I only have read about in the professional literature. In addition, I had the opportunity to meet and work with some of the creators of these curricula, including Drs. Priscilla Laws, Ronald Thornton and David Sokoloff. In general, I think I was able to fulfill the main purpose of the training. I feel, however, that exploring in detail at least four complete curricula in less than 6 days is impossible. But the information I was able to bring back to Tech (manuals, catalogs, etc.) will be very valuable when I teach the course PHYS 3042 (Intermediate Physics Laboratory), a recent addition to the Physical Science/Earth Science Education bachelor's degree.

E. Conclusions and recommendations

As a physics educator, it is my responsibility to ensure that pre-service teachers at Arkansas Tech University become familiar with technology-driven physics education curricula. The knowledge I received after completing the courses *Using Research Based Curricula and Tools to Promote Active Learning in Introductory Courses, Parts I and II* will be undoubtedly applied in several professional contexts.