

Proposal Concept Form

TEEM UP for K-12

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Area of Focus (in-service, pre-service, student outreach, etc.):
Pre-service, in-service, student outreach

Project Description:

The goal of this project is to set up a multi-disciplinary team consisting of mathematics, science, and engineering educators to develop engineering design problems appropriate for pre-service secondary math and science majors and for elementary teaching majors. These problems will be embedded in the methods courses at the elementary and secondary levels. The design problems will be introduced in the methods courses as examples of how to engage elementary and secondary school students in engineering design. These problems will also be used as a real world context for involving K-12 students in mathematical and scientific thinking and problem solving.

A secondary goal will be to work on designing similar engineering problems for K-12 in-service teacher professional development.

1. Needs Assessment (communities served)

Undergraduate programs, local school districts

2. Project Background / Rationale / Supporting Research

Research base indicates that students are much more engaged in problem solving if they have a clearly articulated context to which they can relate. Teachers can also be more successful using concrete design problems which of necessity require students to be involved.

3. Project Organization / Management / Partnerships

We will constitute and supply with resources a faculty team consisting of mathematics, science, and engineering educators. The team will report to the department head of teacher preparation.

4. Specific Objectives

(1) Survey the teaching and learning standards for mathematics and science.

(2) Develop a preliminary set of design problems that can be implemented at the elementary

and secondary levels.

- (3) Pilot the design problems in both elementary and secondary methods courses.
- (4) Get feedback from methods course instructors, field experience teachers, and students.
- (5) Revise problems based on that feedback.

5. Marketing Plan

People involved in the project are going to implement it. So no marketing is necessary.

6. Budget / Funding Strategy / Sustainability

Six quarter time releases for a total of 1.5 FTE ~\$30,000.

S & E (laboratory supplies, etc.) ~\$5,000

Total direct costs ~ \$35,000

Funding Strategy: NSF, Local foundations, Corporations in the area.

Sustainability: Future development will be developed by the University.

7. Timeline

We will use the rest of 2004 to develop the project and get it funded. Team will start development of problems in Spring 2005 and finish development in Summer 2005. The problems will be implemented in Fall 2005 semester. Problems will be revised in Spring and Summer 2006, and final problems will be implemented in Fall 2006.

8. Evaluation / Accountability

- (1) Look at the problem-solving performance of the K-12 students in the pre-service teachers' classrooms (methods and student-teaching field experience).
- (2) Assessment of pre-service teacher performance by methods instructors and student teaching university supervisors.