**Budget Justification**

**A. SENIOR PERSONNEL**

Principal Investigator, Dr. X, will oversee the research and development work related to *Investigation* for the College of Education. Throughout the 4 years of the project, she will devote 12.5% of academic year time (1.25 mos) and 0.5 month of summer to the project.

Senior Investigator, Dr. Y, will oversee the research and development work related to the energy systems content and practice develop for the teaching tools and the development of research tools for the College of Engineering. He will devote 0.5 month of summer to the project.

Mr. Z will oversee the classroom studies in years 3 and 4 and will provide expert guidance in the development work for these studies in years 1 and 2. He will coordinate the statistical analysis of the classroom studies. He will devote 1.12 calendar months effort in years 1 and 2, and 2.25 calendar months in years 3 and 4.

**B. OTHER PERSONNEL**

One annual quarter time doctoral students from the College of Engineering will be hired to work on this project and will help with teaching tools development work, and with data collection and analysis.

Hourly student assistance: One to two undergraduate students will also help out with transcribing video and audio, and with data entry during all 5 years.

All salaries are expected to increase at 3% per year.

**C. FRINGES**

Michigan State University utilizes a specific identification fringe benefit system for faculty and staff. For graduate assistants, Michigan State University charges a flat rate based upon the cost of health care. Grad health rates are anticipated to increase at 8% per year. The summer salary for faculty and hourly student pay are assessed a 7.65% rate for FICA tax.

**D. DOMESTIC TRAVEL**

Travel funds for both PIs are included for the annual PI meeting in Washington, DC. Additionally, both PIs and the graduate student will travel to NSTA and local teacher conferences each year to present project findings. Travel is based on the rates found in large cities like Washington, DC, San Francisco, CA, and New Orleans, LA, where these meetings are typically held (Round trip airfare -$500, hotel - $250/night for 3 nights, per diem - $71, and ground transportation and parking – $37).

**G. OTHER DIRECT COSTS**

1. Materials and Supplies:

Funds are requested for investigation materials to be used with teachers and cameras to record the classroom interactions in year 3-5 during professional development.

Cameras

* Year 1: 2 high resolution cameras and microphone to record enactment cycles: $635 each camera + 119 microphone (total – 1,508)
* Year 3: 2 additional high resolution cameras and microphone to record school enactments (total – 1,508)

Curriculum Materials Supplies

Year 1: Materials to conduct investigation on portable energy systems for Phase 1 (two enactments): 2,500

Year 3: Materials to conduct investigation on portable energy systems for Phase 1 (12 classrooms): 6,000

3. Consultants:

The three person expert advisory board will meet with and to conduct evaluation activities. Each member will receive $3000/year for 5 days of work (12k/board member over the life of the project).

5. Subaward:

There will be one subaward to the University of North Carolina at Greensboro. Subaward PI, Dr. A will oversee the North Carolina local design and implementation team. She will coordinate data collection and analysis for the North Carolina sites.

6. Other

Graduate student tuition benefits are calculated in accordance with MSU policy. Increases of 4.0% per year are assumed for graduate tuition and fees. Graduate student tuition and fees and are not included in the modified total direct costs calculations.

Participant Pay: In year 2, 4 teachers will collaborate with project staff to support a formal classroom focus on materials design. In year 3, 6 teachers will collaborate with project staff in Michigan to pilot the InvestigAction unit, and receive an incentive of $750 each; in Year 4, the same teachers will pilot the InvestigAction unit and conduct mini studies on student work, and receive an incentive of $1000 each.

**I. FACILITIES AND ADMINISTRATIVE COSTS (F&A)**

The negotiated F&A rate at Michigan State University is 53.5% with a Modified Total Direct Cost base.