COLLABORATIVE RESEARCH: Expanding and sustaining research capacity in engineering and technology education: Building on successful programs for faculty and graduate students (DUE-0817461)

This proposal addresses the continued need for developing engineering education researchers by leveraging the success of past programs and the expertise gained by various project team members, many of whom are participating in the proposed work

The proposed work has three goals:

1. Design and deliver a **new generation of programs** to educate engineering and engineering technology faculty and graduate students to conduct and use educational research which are effective, flexible, inclusive, and sustainable after funding ends.
2. Foster a **virtual community** of engineering and engineering technology education researchers through the use of Purdue nanoHUB-based technology.
3. Evaluate the **impact** of these programs on individuals who participate and on the participants' students and institutions.

The proposed project will focus on two areas of the CCLI cyclic model.

- *Creating Materials:* New educational materials for engineering and engineering technology faculty will be created in during the development of three programs: Short courses in engineering education research, workshops for curriculum developers, and workshops in How People Learn Engineering. These materials will be made available on site in hardcopy to participants of the respective programs and on the newly created rreeHUB.org.
- *Developing Faculty Expertise*: This project continues and expands the work started by projects such as the CCLI-ND funded Rigorous Research in Engineering Education and provides opportunities for engineering and engineering technology faculty and graduate students to learn how to conduct rigorous educational research and use the results of research to develop evidence-based curriculum.

The intended result of this project is to better equip engineering and engineering technology faculty and future faculty (graduate students) to conduct and use educational research to transform the engineering education experience.

Intellectual merit: The activities of the proposed project are transformative in that they (1) contribute to the creation of the new discipline of engineering education research and (2) evaluate the impact of these programs on the conceptions of individual participants and on their institutions. Outcomes of this evaluation can contribute to theories of impact (infrastructure, pathways, metrics, challenges and strategies, change agents and epistemologies) and make visible types of impact that may be crucial to long-term sustainability of educational improvements.

Broader Impact: Emphasis will be placed on recruiting a diverse group of faculty and graduate students representing both engineering and engineering technology. Targeted outreach to faculty at 2-year colleges and faculty and graduate students at Minority Serving Institutions will be a priority in this project and funds are allocated for this outreach through subawards to Madison Area Technical College and the National Academy of Engineering's Center for the Advancement of Scholarship in Engineering Education.

Collaborating Institutions: Purdue (Lead), Alverno College, Colorado School of Mines, Howard University, Madison Area Technical College