Community for Advancing Discovery Research in Education

Sample Postdoctoral Mentoring Plan

NSF Project Name: *Community-Based Engineering as a Learning and Teaching Strategy for Pre-Service Urban Elementary Teachers*
Principal Investigator: *Kristen Wendell*

Funds are requested to support a full-time postdoctoral researcher for Years 2 and 3 of the project. The primary duties of this researcher will be to plan and co-facilitate the June professional development institute on community based engineering (Year 2), to develop materials for the academic-year Professional Learning Community (Year 3), to coordinate the collection of data from the science methods course, June institute, and Professional Learning community (both years), and to assist with data analysis. The ideal candidate for this position will have a degree in a science or engineering field, a doctorate in science education or engineering education, and experience in K-12 education settings.

At U Mass Boston, the postdoctoral researcher will be located in the Center of Science and Mathematics in Context (COSMIC), a joint venture of the College of Education and Human Development and the College of Science and Mathematics. Including the PI, COSMIC houses four College of Education faculty members (two in science education and two in math education), and it has several affiliated faculty members in the College of Science and Mathematics. Administrative assistants, project coordinators, graduate students, and undergraduate students also collaborate on COSMIC efforts. As a result, the postdoctoral researcher will be part of a strong STEM education research community dedicated to advancing high quality teaching and learning at all levels. Mentoring of the postdoctoral researcher will take place in the following ways.

1. Reflection opportunities. In addition to informal discussions that occur normally during work on the project, the PI and the postdoctoral researcher will have a weekly formal meeting. At these meetings, the PI and postdoctoral researcher will discuss data analysis results and manuscripts in preparation. Goals or deliverables for the next week will be set at the end of each meeting. The PI will also offer career counseling and facilitate reflection on the teaching and mentoring that the postdoc is doing in the methods course and with the project's graduate student.

2. Teaching opportunities. As the community based engineering module is implemented in the science methods course, the postdoctoral researcher will be invited to lead a portion of the activities. The postdoctoral researcher will also co-facilitate the June professional development institute. Periodically these teaching experiences will be video recorded, and the PI and postdoc will view the videos together and reflect on the postdoc's strengths and areas for improvement in teaching.

3. Mentoring opportunities. The postdoctoral researcher will help to supervise the data collection and analysis efforts of the graduate student on the project. The PI will monitor how this supervision is going and offer guidance as needed.

4. Publication and presentation opportunities. The PI will recommend a goal for the postdoctoral researcher of writing one publishable manuscript in Year 2 (using data from the science methods course), writing one publishable manuscript in Year 3 (using data from the first June Institute and Professional Learning Community), and giving one conference presentation in Year 3. These outputs will be targeted toward Research Questions 1, 2, and 3 – on the pre-service teachers' engineering design abilities, understandings of science and engineering practices, and abilities to identify and respond to students' science and engineering ideas and practices.

5. Grant proposal opportunities. Once the postdoctoral researcher has developed relationships with the teachers participating in the June institute and Professional Learning Community, there may be an opportunity to conduct a pilot (non-funded but IRB-approved) study on the impact of community based engineering on the elementary *students* of one of two of those teachers. If it goes well, and the postdoctoral researcher is interested, this work could lead to a grant proposal focusing on elementary students and community based engineering. The PI would guide the postdoctoral researcher through the grant proposal process.

6. Other professional development. The postdoctoral researcher will also attend bi-weekly COSMIC meetings, where he or she will be exposed to responsible professional practices and experience collaboration with researchers from diverse educational and cultural backgrounds.