

To: PIER Students and Steering Committee
From: David Klahr and Sharon Carver
Subject: Field-Based Experience and Integrative Interdisciplinary Project Requirements
Date: Monday, April 30, 2007

The goal of this document is to provide sufficient specificity to guide student and faculty planning regarding the required PIER Field-Based Experience (FBE) and Integrative Interdisciplinary Project (IIP), yet clear flexibility to tailor the experiences to the unique profiles of our diverse student population.

The FBE and IIP are two of the cornerstones of our training program, ones that were deemed to be an important feature of PIER in the positive evaluation we received from IES when creating the program. As the program has matured, we are in a better position to describe the scope and specific aspects of these two Core Program Components (see below).

Core Program Components:

- Years 1-5: Integration into PIER Community via:
 - PIER Social Events (Welcome Reception, etc.)
 - Colloquium Series & Students-only Pro-Seminar with Speakers
 - Bi-Weekly Brown Bag Series
- Years 1-2: Engagement in research as part of an augmented research apprenticeship, with interdisciplinary faculty committee, and yearly public presentation of original research
- Years 1-2: Department coursework plus three course PIER Core Sequence:
 - Scientific Research in Education (Klahr)
 - Educational Goals, Instruction, and Assessment (Carver)
 - Research Methods in the Learning Sciences (Coordinated by Koedinger)
- Prior to Year 3 if possible: Field Experience in Educational Context to develop understanding and appreciation for the reality of classroom and school based systems
- Years 1-3: Additional Coursework / Individualized Training Experiences to meet PIER Core Competencies not otherwise covered in the Student's prior experience or the Home Department's Program (e.g., Statistics, Experimental Design, Educational Technology, etc.)
- Year 3: Integrated Interdisciplinary Project provides immersion in a PIER research team for an educational research project culminating in a public presentation
- Years 4-5: Dissertation Research addressing practical questions in education
- Years 1-5: Progress Evaluation via student's self-assessment relative to the PIER Core Competencies and Faculty Graduate Evaluation Meeting (GEM), together with Home Department graduate evaluation

Field-Based Experience

The purpose of the FBE is for students to:

- understand and appreciate, through first hand exposure, the reality of classroom and school based systems, and
- experience the real-world management, organizational, interpersonal, cultural, contextual and practical constraints¹ that they will face when they attempt to conduct research in field settings.

In addition to providing students in this track with the necessary field experience, improving their abilities to understand practitioners' needs and to communicate directly with teachers and children, this experience will serve as a launch pad for field-inspired interdisciplinary projects in the third year and dissertation projects in the students' fourth and fifth year. Extensive experience as a classroom teacher -- e.g. having been employed as a real teacher in real school for at least a year -- may fulfill this requirement, if approved by the PIER Steering Committee.

Expected effort for a FBE:

FBE's can be expected to require up to a total of 10 hours per week spread over a semester (i.e., essentially equivalent to a course experience). In some cases, the properties of a student's other research activities – or prior experience – may meet the intent of the FBE, which would then not have to be done as a separate project. Students should prepare a 1-page proposal for approval by the PIER Steering Committee. In future cohorts, students will be encouraged to complete this experience within their first two years, prior to the interdisciplinary project.

Examples of FBEs (Note that PIER faculty will help with site suggestions and access issues.):

- Intern with a teacher one day per week for a semester.
- Design and teach a weekly “enrichment” course in a local school for a semester. For example, students might arrange to actually implement the project they developed for the Educational Goals, Instruction, and Assessment course.
- Participate in the field component of an ongoing research project involving intervention in a local school.
- Augment an ongoing research project by implementing it in a school or schools.
- Collaborate with a school / teacher to track the adoption and implementation of a new curriculum.

FBE Report of Impact

The FBE is designed to complement and facilitate other aspects of the PIER program. The field experience would provide the fertile soil from which the seed for applied research could blossom. Students will be responsible for providing a **written report at the end of the experience** that summarizes their specific FBE and describes their perspective on what they learned from the experience and how it will improve their ability to do research in the field of education science (Approximately 2500 words).

¹ One immediate such practical constraint is that all new PIER students should apply for ACT 33 and 34 clearances (Child Abuse and Criminal Record Clearances from the Commonwealth of PA) so that they can work in schools. See: <http://www.dpw.state.pa.us/child/childabusenlect/003671038.htm>

Integrative, Interdisciplinary Project

The purpose of the IIP is for students to:

- participate in an interdisciplinary research team for an educational research project culminating in an informal public presentation (e.g., EdBag) and dissemination via more formal venues if possible,
- develop project management, organizational, and research skills necessary to conduct interdisciplinary educational research, and
- stretch by learning new methodologies and theoretical frameworks.

Expected features of the IIP:

- The research team must be clearly interdisciplinary, though not necessarily interdepartmental. It should include at least one PIER faculty member and preferably involves multiple PIER students, but cases can be made for alternative or additional collaborators. The PIER Steering Committee will help coordinate the match between students seeking project opportunities and ongoing educational research happening on campus and in the community.
- The project must be designed so that each team member has expertise to contribute and specific areas in which to be stretched, but it does not have to be in an area separate from faculty and/or students' primary research interests.
- The project must be approved by the PIER steering committee. Typically, students submit a one-page proposal outline to get the general concept approved prior to completing the full template below.
- IIP's can be expected to require approximately 10 hours per week spread over 2 semesters and a summer.
- Students are encouraged to provide the PIER community with a midway progress report (e.g. via an EdBag feedback session featuring multiple projects) and then expected to complete a written report of the project at its culmination. The report should include description of the project process and products, together with reflection on the experience and the results.
- The project should be completed prior to each student's 4th year of graduate study.

Examples of IIPs:

Evaluation of On-Line Mathematics Games

How effective are the computer math games used by elementary school students in the Pittsburgh Public Schools at teaching the intended skills?

(Matt Easterday, Elida Laski, and Amy Ogan with PIER Coach: Marsha Lovett, and Collaborators from the Pittsburgh Public Schools – Elem Math)

Planning in Tutoring Systems

In what ways is high school students' learning affected by giving them more control of their solution paths during geometry tutor lessons?

(Yvonne Kao and Ido Roll with PIER Coach Ken Koedinger and Collaborators from the PSLC LearnLab – Geometry)

Meaningful Assessment for Professional Development Education in the Software Architecture Domain

How can adult learning from short-term workshops be effectively assessed?
(Elsa Golden with PIER Coaches Sharon Carver and Brian Junker and Collaborators from the Software Engineering Institute - Post-Grad Certificate Courses)

IIP Proposal Template: (Document of approximately 3-5 pages, to be submitted to the PIER Steering Committee for their approval)

Situate the Proposal within the Emerging Field of the Learning Sciences

- Theoretical Frameworks
- Relevant Literature / Problem(s) to be Addressed
- Research Question(s)
- Innovations (theory, methods, technology, interdisciplinary approach, etc.)

Propose the Research Project as Specifically as Possible in All Categories that Apply

- General Nature of the Project and Specific Relation to the Research Question(s)
- Educational Context
- Participants (students, teachers, etc.)
- Learning Goals
- Assessment (especially specifying what is new and what already exists)
- Intervention (especially specifying what is new and what already exists)
- Research Design (with all the standard subsections on hypotheses, methods, controls, materials, scoring, analysis, statistical power, etc.)
- Evaluation (validity, reliability, feasibility, etc.)

Detail the Project Management Plans

- Team member roles & responsibilities, including both contributions and goals for learning
- Faculty Advising Team roles & responsibilities
- Additional Partners (e.g., tech designers)
- Milestones and Timeline for achieving them
- Necessary Resources and proposed sources
- Risks and Strategies for mitigating them

Connect to the PIER Program Themes

Theme A: Continual two-way flow of ideas and challenges from basic laboratory studies to real-world instructional applications

Theme B: Knowledge assessment at multiple grain sizes (temporal and cognitive)

Theme C: Leveraging Educational Technology for Educational Research

- Specific ways the project addresses one or more of the educational goals listed above
- Reflection on the potential impact on current and future research (e.g., timing, focus, methodology, etc.)