COURSE SYLLABUS
EDUC 8348: Approaches to Intervention in the Learning Sciences
Instructor: Bill Penuel

Course Overview
All research intervenes, and learning sciences research is no exception. But what forms do interventions in the learning sciences take? This seminar explores three different models of intervention research in the learning sciences: cultural-historical, systemic design-based research, and scaling up/experimental research. We will analyze cases that illustrate each model, cases selected because of their broad impact on thinking of different groups of learning scientists today. Readings will provide students in the seminar with opportunities to compare and contrast the theoretical and practical commitments of the different models, results from specific studies, and impacts on research and practice. A practicum experience at El Pueblo Mágico, an afterschool program at Sanchez Elementary School in Lafayette, will give students a direct encounter with one of the cases. A culminating project will provide students with an opportunity to synthesize what they have learned by developing a proposal for research and development of an intervention that could enhance the El Pueblo Mágico program and that follows the guidelines of a current program announcement of the National Science Foundation.

Learning Performances
By the end of this course, you will be able to:

- Use a variety of methods to identify stakeholder needs and goals for program development and improvement
- Formulate research questions at the intersection of stakeholder needs and what the field needs to know
- Devise a plan for research and development that addresses questions posed
- Locate your plan within a family of approaches to research and development in the learning sciences

Assessments
Your main assignment for this class will be to write several sections of an NSF proposal for research that could be conducted at El Pueblo Mágico. You may choose to write a proposal for one of the following two programs:

- ITEST: Information Technology Experiences for Students and Teachers
- DRK-12: Discovery Research (K-12)

You will work with 2 or 3 other participants in the class on the proposal and on all assignments leading up to the final product.

Each assignment will require you to develop a draft section of a proposal or help you conceptualize some aspect of the proposal. Your final assignment will be to revise and integrate these sections. The process of grant writing is an iterative one: you can expect to want or need to rethink your proposal completely at least once during the course.
You must follow the NSF’s Grant Proposal Guidelines for formatting of each assignment and adhere to the page limits below:

http://www.nsf.gov/pubs/policydocs/pappguide/nsf11001/gpg_2.jsp#IIB

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Date Due</th>
<th>Percent of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serve as discussion leader for seminar</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Draft statement of Need and Purpose (1 p)</td>
<td>10/3/11</td>
<td>10</td>
</tr>
<tr>
<td>Draft research questions and argument for their importance (1.5 pp)</td>
<td>10/17/11</td>
<td>10</td>
</tr>
<tr>
<td>One-page abstract for advisory board + proposed advisors list and description of how their expertise is relevant (2 pp)</td>
<td>10/24/11</td>
<td>10</td>
</tr>
<tr>
<td>Description of the Proposed Intervention (3 pp)</td>
<td>11/7/11</td>
<td>10</td>
</tr>
<tr>
<td>Research and Development Plan (5 pp)</td>
<td>11/19/11</td>
<td>10</td>
</tr>
<tr>
<td>Present draft proposal to class</td>
<td>12/5/11</td>
<td>10</td>
</tr>
<tr>
<td>Revised Proposal (12 pp + References)</td>
<td>12/12/11</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

**Seminar Format**

The weekly classes will include a discussion of the readings and provide for opportunities to gain practice with design techniques that can help you build a successful proposal. Each week, we’ll begin with identifying your questions about the readings that you’d like to discuss over the course of the class and specific claims made by researchers you’d like the class to consider (for whatever reason), and then we’ll take these up separately in class discussion.

Some weeks will include a guest speaker who will provide context for the readings. When there is no guest speaker, participants may present a summary of a reading they find relevant to their proposal.

The seminar will be unusual in that it has a service component. The service component includes a once-per-week commitment to volunteer at El Pueblo Mágico alongside undergraduates and staff at the program. You will have a different role from undergraduates: your service at the site is aimed at building knowledge of how the site might better build upon the strengths and address needs of its diverse participants. The service component will provide you with direct experience to a particular context for intervention design.

**Texts**

All journal articles and PDFs will be available through Dropbox. In addition, you will need to purchase one text at the CU Bookstore:

Readings and Assignments by Week

**Week 1: August 22, 2011**

**Driving Question**

*What does it mean to ‘intervene’ in the learning sciences?*

**In class Design Activity**

Draw Your Experience: Draw the process for developing an ITEST proposal

**Readings**


NSF’s ITEST Program Announcement (NSF 11-525)

**Week 2: August 29, 2011**

**Driving Question**

*What are strategies for identifying and synthesizing diverse perspectives on the need for intervention?*

**In class Design Activity**

The Five Whys: What interests you about the learning sciences?

**Readings**


**Week 3: September 5, 2011**

Labor Day, no class

**Week 4: September 12, 2011**

Guest: Anna-Ruth Allen, Site Coordinator, *El Pueblo Mágico*, Alex Repenning

**Driving Question**

*What is the Fifth Dimension?*
In class Design Activity
Unfocus Group: Remake the space of El Pueblo Mágico

Readings

**Week 5: September 19, 2011**
Guest: Kris Gutiérrez – Find new date for her
Driving Question
What are sociocultural approaches to intervention in the learning sciences?

In class Design Activity
Character Profiles: Represent needs of different personas

Readings

**Week 6: September 26**
Driving Question
What is the evidence regarding what works, when, and for whom?

In-class Design Activity
Competitive Product Survey: What are alternative sustainable designs for afterschool programs?

Readings

Week 7: October 3
Guest by Skype: Phil Bell, University of Washington and the LIFE Center
Assignment Due
Draft statement of Need and Purpose (1 p)
Driving Question
Where are sociocultural approaches to intervention headed?
In-class Design Activity
Activity Analysis: Representing tasks, actions, tools, people, and interactions in an afternoon at El Pueblo Mágico
Readings

Week 8: October 10
Guest by Skype: Barry Fishman, University of Michigan
Driving Question
What is LeTUS?
In class Design Activity
Empathy Tools: Trying out My World
Readings

**Week 9: October 17**

**Assignment Due**

Draft research questions and argument for their importance (1.5 pp)

**Driving Question**

*What are systemic approaches to design-based research?*

**In class Design Activity**

Predict Next Year's Headlines: What Newspapers Will Say about Your Project

**Readings**


**Week 10, October 24**

**Assignment Due**

One-page abstract for advisory board + proposed advisors list and description of how their expertise is relevant (2 pp)

**Driving Question**

*What is the evidence regarding what works, when, and for whom?*

**In class Design Activity**

Scenario: Describe Your Participants’ Experiences

**Readings**

LETUS Water Unit.


Week 11, October 31
Possible Guests: Ben Kirshner (or John Falk)

Driving Question
Where are systemic approaches to design-based research headed?

In class Design Activity
Group Brainstorming and Iteration (CILT): Refining your question and identifying entailments for the research and development process

Readings

Week 12, November 7
Assignment Due
Description of the Proposed Intervention (3 pp)

Driving Question
What is scaling up research?

In class Design Activity
Structuring Your Argument: Re-Write Your Abstract

Readings

Week 13, November 14
Assignment Due (November 19)
Research and Development Plan (5 pp)
Guest: Jeremy Roschelle or Nikki Shechtman, SRI International
Driving Question

*How have learning scientists approached scaling up research?*

In class Design Activity

Draw the Experience: Create a Visual Theory of Change

Readings


Week 14, November 21

Thanksgiving break, no class

Week 15, November 28

Draft presentations of proposals by student groups

Reading

NSF’s Merit Review Criteria

Week 16, December 5

Draft presentations of proposals by student groups
Reasonable Accommodation

Disability: If you qualify for accommodations because of a disability, please submit to me a letter from Disability Services early in the semester so that your needs may be addressed. Disability Services determines accommodations based on documented disabilities. To contact Disability Services, call (303) 492-8671 or view www.colorado.edu/sacs/disabilityservices.

Religious Obligations: University policy is for teaching faculty to make every effort to accommodate all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or other required attendance, provided they notify instructors well in advance of the scheduled conflict. Whenever possible, students should notify faculty at least two weeks in advance of the conflict to request special accommodation. The campus policy can be viewed at www.colorado.edu/policies/fac_relig.html.

Classroom and Course-Related Behavior: As a result of extensive discussions with and recommendations from faculty and students, a new classroom behavior policy and associated procedures have been adopted. See www.colorado.edu/policies/classbehavior.html.

Student Honor Code: A Student Honor Code system has been implemented in all schools and colleges and students should be familiar with these new policies and procedures. You can view the honor code information at www.colorado.edu/academics/honorcode/.

Sexual Harassment Policy: The University of Colorado Policy on Sexual Harassment applies to all students, staff and faculty. Sexual harassment is unwelcome sexual attention. It can involve intimidation, threats, coercion, or promises or create an environment that is hostile or offensive. Harassment may occur between members of the same or opposite gender and between any combination of members in the campus community: students, faculty, staff, and administrators. Harassment can occur anywhere on campus, including the classroom, the workplace, or a residence hall. Any student, staff or faculty member who believes s/he has been sexually harassed should contact the Office of Sexual Harassment (OSH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the OSH and the campus resources available to assist individuals who believe they have been sexually harassed can be obtained at: http://www.colorado.edu/sexualharassment/
Relevant Performance-based Standards for Colorado Teachers

Though this is a doctoral seminar primarily focused on preparing you to engage in research and development in the learning sciences, the course content directly addresses the following standards focused on teachers and teaching:

- Understand the cognitive processes associated with various kinds of learning (e.g. critical and creative thinking, problem structuring and problem solving, invention, memorization and recall) and ensure attention to these learning processes so that students can master content standards. (5-5)

- Communicate a variety of assessment results, and their implications to students, parents, guardians, professionals, administrators, and the community. (5-9)

- Understand and respond to influences on educational practice including:
  - Federal and state constitutional provisions.
  - Federal executive, legislative and legal influences.
  - State roles of the governor, legislature and State Board of Education.
  - Local school districts, boards of education and boards of cooperative educational services.
  - Non-traditional and non-public schools, including: charter schools, religious schools and home schooling.
  - Public sector input from business, advocacy groups, and the public. (8-3)