

Design-Based Research Design of Learning Environments

Fall 2011 Syllabus

Course Information

Instructor Information

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Course Description

In this class, students will learn what about design-based research and how to design and conduct this kind of inquiry. Throughout the class, students will use data collected by the instructor to examine various design research principles and to consider how learning scientists approach the study of learning environments such as technology, curriculum units, and teaching strategies. We will take an action-oriented approach to the conduct of design-based research in the context of actual research projects.

Learning goals

1. Understand the nature of design-based research
2. Develop skills in designing a design-based research study
3. Design instruments and data collection plans for a DBR study
4. Understand how video analysis can be used in DBR and develop skills in this type of analysis
5. Complete the human subjects certification and learn how to navigate the process of applying for IRB approval
6. Learn how to write a research proposal using academic style appropriate for the discipline

Textbook & Course Materials

Textbook:

A. E. Kelly, R. A. Lesh & J. Y. Baek (2008). *Handbook of design research methods in education*. New York: Routledge.

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- Quintana, C., Shin, N., Norris, C., & Soloway, E. (2006). Learner-centered design. In R. K. Sawyer (Ed.), *Cambridge handbook of the learning sciences* (pp. 119-134). New York: Cambridge.
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Course Assignments

1. Class Participation

Class Discussions. All class members are expected to actively participate in the discussions each week. (10%)

2. Blogs and Contributions to class wiki. All class members are expected to reflect on readings in blogs and to comment on at least 2 other students posts. Reflections should be completed by 8:00 pm the night before class. We will also be maintaining a

class wiki in which we will use what we have learned to jointly construct standards of quality for design-based research (15%)

For the assignments that follow, you may work collaboratively

3. Annotated Bibliography (2 to 4 pages, double-spaced) DUE: Week 4

Each of you will be expected to create and share an annotated bibliography associated with your final course project. Identify and briefly describe relevant prior research and how it relates to your project. We will share the bibliographies during class. (5%)

4. Theoretical framework (1-2 pages, double spaced). DUE Week 5.

Describe the theoretical framework that you will use for your project and why that is an appropriate framework for the research questions that you are posing. We will discuss these in class. (5%)

5. Project Variations Document (1 to 2 pages, double-spaced) DUE: Week 6

Briefly outline at least three alternative approaches that you could take with your complex intervention. This assignment should be an act of brainstorming where you push on the framing of your research focus, educational objectives, and design approach. It is worth thinking broadly before the design gets fixed. This may be based on work you have done in other classes. (5%)

6. Elaborated Project Plan (2 to 3 pages, double-spaced) DUE: Week 7

Describe the educational focus associated with your project, the package of "objects" to be designed, and what you know about the research setting that is relevant to your project. (5%)

7. Design Prototype DUE: Week 8

Over the course of this semester, you need to be making progress on your designs. The designs need to be complete by the time of enactment and data collection. There will be a public design reviews during so you can present your design work and receive feedback from the group. In class we will discuss low-fidelity prototyping methods (e.g., paper prototyping) you may elect to use. (5%)

8. Data Collection Plan (detailed spreadsheet) DUE: Week 9

In preparation for the enactment phase of your research, create a worksheet detailing the kinds of data you plan to collect and any related contingencies (e.g., needing to author assessment items for use on a pre/post test). During your data collection phase, you can use the worksheet to keep track of your activities in the field. During the data analysis phase, you can update the spreadsheet in order to track progress in your analysis. It can be a working document for your actual study. (5%)

9. Summarize video analysis session (2-3 pages, double spaced). DUE: Week 12

Based on the video analysis sessions in class, describe the video and summarize the analysis. (5%)

10. Draft versions of instruments DUE: Week 13.

Prepare draft version of written instruments that you are planning to use. At a minimum, these must address targeted learning outcomes. You may do this through

a written measure, performance assessment, or structured interview. Be clear about how each instrument will address your research question and how you will handle the data (e.g., will it require additional coding, will surveys need to be scaled in some way, etc). (10%)

11. IRB proposal DUE: Week 14. Include your actual proposal per IRB guidelines including appropriate forms, research protocols, and instruments. You may need to get letters of support from research sites (5%)

12. Research Proposal (5 to 7 pages, double-spaced) DUE: 15
Your research proposal should build upon previous assignments. The research questions, argument, design, and methods associated with your research project should be detailed, and your project's relevance to the literature should be examined. (25%)

Please double-space all written work and use a 12-pt. font. Unfortunately I cannot accept email attachments or faxes unless prior arrangements have been made.

Academic Integrity Policy

- All students must follow the RU Code of Student Conduct which can be accessed at: <http://rci.rutgers.edu/%7Epolcomp/judaff/ucsc.shtml>
- For information on the academic integrity policy, please go to: <http://www.rci.rutgers.edu/~polcomp/integrity/policy.shtml>
- A multimedia presentation on plagiarism can be found at: <http://www.rci.rutgers.edu/~polcomp/integrity/realifeexamples.html>

Related regulations may also be found in the Rutgers Graduate School of Education Catalog **Important Note:** This syllabus, along with course assignments and due dates, are subject to change. It is the student's responsibility to check Sakai for corrections or updates to the syllabus. Any changes will be clearly noted in course announcement or through Sakai email.

Topic Outline/Schedule & Assignments

Class	Date	Topic	Readings	Assignments
Conceptualizing Design Based Research				
1		General intro to design based research Comparison with other genres of research (e.g., action research)	Derry et al, 2006	
2		Conceptions of Design-based Research	Brown (1992) Allan Collins (1992)	Blog about initial ideas of DBR
3		Design-based research in education: Issues and potential	Cobb et al. (2003) Design-based research collective (2003) Shavelson, Philips & Towne (2003)	Reflect in blog on controversies in DBR; read other blogs
4		Understanding Learning in DBR	Lobato, 2008 Cobb & Gravemeijer, 2008 Hmelo-Silver, Nagarajan, & Chernobilsky (2009)	Annotated bibliography Blog
5		The place of theory in design based research	Bell, 2004 Sandoval, 2004 Barab (2006) Recommended: Greeno, Collins, & Resnick, 1996	Theoretical framework document
Doing Design Based Research				
6		Multiple enactments over time and space	Puntambekar, Stylianou, Goldstein (2007) Zhang et al., (2009) Bannan-Ritland & Baek (2008)	Project variations document
7		Methodology in DBR, Creating a design prototype	Sloane & Kelly (2008) Middleton et al., 2008) Recommended: Quintana et al. (2006)	Students identify relevant readings working in small groups for next 2 classes

Class	Date	Topic	Readings	Assignments
				Elaborated project plan
8		<p>What are you going to do examine in your research design?</p> <p>Testing out of: Scaffolds for existing problem Use of a piece of technology Implementation of a curriculum unit Conversion of a curriculum unit to an inquiry oriented unit, an inter-disciplinary unit and test this out.</p>	Students identified readings	Design prototype for Design Review
9		How will you study the design, what data will you collect on whom and where (hopefully in own worksite)	Students identified readings	Data collection plan
10		Use of video in design based research	Derry et al, 2010; Barron, Pea, & Engle, in press	
11		Use of video in design based research – Data Analysis	Powell, Francisco, & Maher (2003); Jordan & Henderson (1995)	
12		<p>How will you analyze your data</p> <p>Identifying needed data sources Designing measures</p>	<p>Castanheira, Green, & Yeager (2007)</p> <p>Additional reading TBF</p>	Video analysis
13		<p>How will you analyze your data, part 2</p> <p>Looking for unintended consequences</p> <p>Analyzing enactments</p> <p>Qualitative and quantitative approaches</p>	<p>Hmelo-Silver, Nagarajan, & Derry (2006)</p> <p>Chi (2007)</p> <p>Cresse & Hess (in press)</p>	Draft versions of instruments

Class	Date	Topic	Readings	Assignments
14		Working on designs Preparation of IRB paperwork		IRB
15		Summations and project presentations		Research proposal