

EDC&I 582: Design-based Research Methods in Education – Part I

Spring 2013 Thursdays 4:30-6:50 Miller Hall 320

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PLEASE NOTE: This class is the second half of a two-quarter sequence. It is only open to students who participated in the first portion of the sequence in the fall (EDC&I 581).

COURSE OVERVIEW

“As a design scientist in my field, I attempt to engineer innovative educational environments and simultaneously conduct experimental studies of those innovations. This involves orchestrating all aspects of a period of daily life in classrooms, a research activity for which I was not trained.”

— Ann Brown (1992)

“Rather, the master question from which the mission of education research is derived: *What should be taught to whom, and with what pedagogical object in mind?* That master question is threefold: what, to whom, and how? Education research, under such a dispensation, becomes an adjunct of educational planning and design. It becomes design research in the sense that it explores possible ways in which educational objectives can be formulated and carried out in the light of cultural objectives and values in the broad.”

— Jerome Bruner from *Issues in Educational Research* (1999)

Design-based research methods are a form of educational inquiry that has emerged over the past twenty plus years. Design-based research involves the orchestration and study of complex educational interventions in naturalistic settings. In contrast to methods that are strictly observational, design-based research seek to shape and even engineer learning environments and experiences “in the wild.” Design experimentation might focus on such endeavors as: the creation of a new instructional sequence, the development of a new professional development approach, the development of a new exhibit or the design of a new learning technology. This form of inquiry necessarily involves foundational features of design practice as well as quantitative and qualitative research as appropriate.

This course has two main purposes. First, it introduces students to different design-based research methods in educational research. Second, it provides students with an intensive experience in carrying out their own design-based research studies. Through a combination of readings, lectures, demonstrations, discussions, site visits and class exercises, students will be introduced to the issues and practices associated with design-based research and how different researchers engage in this kind of work. By learning about the work of different researchers, students will also be introduced to distinct forms of design-based research in education. In their

practicum experience, students will apply what they have learned to the design and conduct of their own design-based research studies. While the first quarter of this class focused on identifying a context for design research and engaging in design activities, this second quarter focuses on the use of the design in a real-world context (e.g., not a contrived context) and the study of what takes place. Correspondingly, this course sequence provides students with an intensive experience in carrying out and reporting their own design-based research studies. Since it is also important to be mindful of the methods that we use (and their stage of development), we will also spend some time thinking critically about the status of our design research studies and the epistemological issues more generally associated with design-based research methods as they are currently practiced in education.

This course is not a substitute for coursework on quantitative or qualitative methods. Therefore, it is strongly recommended that students taking the course have some grounding in qualitative or quantitative research traditions. Most important, I will stress how the purposes a scholar intends to achieve (e.g., theory development, theory refinement, authoring of complex interventions, microgenetic analysis of development) strongly determine the appropriate form of inquiry. We will focus on the following data types: Designed and produced tools, artifacts, and structures; Interviews; Participant Observations/Field Notes; Transcribed Video of learning environments; and slightly survey data. We will focus on the following kinds of analysis: Characterizing artifacts, tools and materials; Task structure and participant structure; discursive and interactional practices; Space and place construction and configurations. This class will support the development of students work into case studies, ethnographies, and micro-genetic analysis of learning events.

By the end of the two-quarter class sequence you will be able to:

1. Understand the various forms of design-based research that are being conducted in the field of education.
2. Design a design-based study within one of the emergent forms.
3. Engage in design activities and discussion.
4. Conduct all phases of a design-based study, including original design work, entry into a setting, data collection, data reduction, data analysis, refinement of designs, and the reporting of research results.
5. Assemble and present conclusions from research in a rigorous and cogent form, both orally and in writing.
6. Offer constructive feedback on colleagues' work and incorporate feedback into one's own work.

PRACTICUM

At the heart of this course is the two-quarter practicum experience: each student (or team) will design and carry out a small-scale design research project. Our goal is for students to experience the full cycle of research, from the identification and narrowing of a problem to the final rendering and reporting of results. Where design and research framing activities were the primary focus of the first quarter, the focus in the second quarter will be on the analysis of the enactment of the design in a particular setting that happened in the intervening quarter and the communication of those results.

STUDY GROUPS

It is important to receive external feedback on research and design efforts during the formative stages. The instructors will provide feedback throughout the course in this vein. In addition, we will also form small study groups (of 3 or 4 persons) that will convene periodically to review the direction and progress of each of the design studies underway. Groups will usually meet outside of class to discuss the projects (see schedule below). Please consider these study groups as an additional resource for providing input about your project.

COURSE POLICIES

1. Prerequisite (strongly recommended): at least one graduate course in statistics, quantitative research design, or qualitative methods.
2. Eligibility: second year doctoral standing, or by permission.
3. Course credits: 3 units each quarter; if your project involves intensive design work, an additional 2 independent study units can be taken with the class.
4. Regular attendance and active participation is required. If for any reason you must miss the class, it is your responsibility to notify one of the instructors beforehand (in writing or by email) and to arrange with a fellow student to make up work and/or to obtain class notes and assignments. Students who have 3 or more unexcused absences during the 10 week quarter will receive “no credit” for the course.
5. Policy on R & I: Students may not use their work in this class as the basis for their R & I presentation if it is planned for Winter or Spring quarters this year, unless specifically approved by your advisor. Before using the work from this course for the R & I requirement, students should confer with their advisors and be prepared to engage in additional analyses and/or data collection at their advisor’s discretion.

ASSIGNMENTS

1. **Class Participation Class Discussions.** All class members are expected to actively participate in the discussions each week about the readings and assignments. *Presenting to Class.* Members of class will be asked to present aspects of their unfolding analysis to the group in order to receive constructive feedback. *Study Groups.* Members of class are expected to actively participate in the activities of their assigned study group (3 meetings / quarter at a minimum).
2. **Data Show-and-Tell.** This quarter we’ll operate more like a research group than a typical graduate seminar. In this vein, you will be asked to present a subset of the relevant data to the class for shared analysis several times in your research groups. You might share a video segment from the enactment, transcripts from an interview, or a coding strategy with data instances along with a draft analysis. You should focus on the central point of your paper and frame the issues you are grappling with.
3. **Research Paper Outline & Conjecture Map** (3 to 5 pages, double-spaced) **DUE: 4/25**
Who is your audience for this study? Where might you publish it? What are the central assertions emerging from your analysis? Whose work are you contradicting? Who has found something similar in the past? Why did you need to intervene in order to conduct this study? You will create an outline that will serve as a working

document that summarizes at a high-level the overall structure and substance of your final research paper.

4. **Preliminary Analysis Draft** (5 to 7 pages, double-spaced) **DUE: 5/23** This working document should be a first draft of the main thrust of your analysis. It should involve interweaving research data with interpretation and analysis of that data and some initial discussion of the implications or conclusions. If the study went somewhat as planned, the analysis should speak to the research question you developed from your research proposal process.

5. **Research Paper** (10 to 15 pages, single-spaced) **DUE: 6/13** A culminating product for this class will be a completed research paper detailing your design research study. The paper should be tightly written and needs to take the form of a scholarly research article. I recommend that you follow a template with a 10-page limitation as this is a typical length requirement for peer-reviewed professional conferences, although you should write in the format that will ultimately be the most useful for you professionally. You will only be able to fully detail one or two assertions in sufficient depth in this length of paper, so you will need to selectively focus on particular aspects of your study / questions.

6. **Interactive Poster Presentation** (poster or talk) **DATE: 6/13** The last class meeting will be organized as a combination interactive poster and formal talk session—presentation formats common to many research conferences. Each student or team will need to construct either: (a) a poster and demonstration experience or (b) a formal 12-minute talk so visitors can learn about your design research project. We will selectively invite relevant outsiders to attend this session in order to learn about your work.

GRADING POLICY

We expect all assignments to be completed in a timely fashion. All written work will be held to high standards and should conform to rules of proper grammar, usage, punctuation, and spelling. Because of time pressures, *late papers will not be accepted unless prior written confirmation has been given by one of the instructors.* Assignments will be weighed according to this scheme:

Participation	10%
Data Show-and-Tell	15%
Research Paper Outline	10%
Preliminary Analysis Draft	15%
Research Paper	35%
Presentation	15%

Please double-space all written work and use a 12-pt. font. You should also follow APA guidelines. Unfortunately we cannot accept email attachments or faxes unless prior arrangements have been made with the instructors.

SCHEDULE OF ACTIVITIES, MILESTONES & READINGS

Week 1 – 4/4 – Introductions

- Overview of class and structure of the quarter.
- Getting a pulse on the status of your projects.
- Beginning drafts of conjecture maps.

Required Readings:

1. Collins, A., Joseph, D., & Bielaczyc, K. (2004). Design Research: Theoretical and Methodological Issues. *The Journal of the Learning Sciences*, 13(1), 15-42.
2. William Sandoval (2013): Conjecture Mapping: An Approach to Systematic Educational Design Research, *Journal of the Learning Sciences*, DOI:10.1080/10508406.2013.778204

Week 2 – 4/11 - Qualitative analysis of social settings

Required Readings:

1. Lofland, J., & Lofland, L. H. (1995). Developing Analysis (Chapter 9). In *Analyzing Social Settings: A Guide to Qualitative Observation and Analysis* (pp. 181-203). New York: Wadsworth.
2. Middleton, J., Gorard, S., Taylor, C., & Bannan-Ritland, B. (2008). The “compleat” design experiment: From soup to nuts. *AE Kelly, JY Baek, & RA Lesh, Handbook of design research methods in education: Innovations in science, technology, engineering, and mathematics learning and teaching*. Routledge, 21-46.

Choose two papers to consider for your analysis. Be prepared to explore the papers in smaller discussions.

Case Study:

Stake, R. E. (2003). Case Studies. In Denzin, N. K., & Lincoln, Y. S. (Eds.). (2005). *The Sage handbook of qualitative research*. Sage Publications, Incorporated.

Ethnography:

Nespor, J. (2006). Finding patterns with field notes. *Handbook of complementary methods in education research*, 297-308.

Discourse Analysis:

Gee, J. P., & Green, J. L. (1998). Discourse analysis, learning, and social practice: A methodological study. *Review of research in education*, 23, 119-169.

Week 3 – 4/18 – Some foundations to consider

Required Readings:

1. Gravemeijer, K., & Cobb, P. (2006). Design research from a learning design perspective. In J. Van den Akker, K. Gravemeijer, S. McKenney & N. Nieveen (Eds.), *Educational design research* (pp. 17-51). London: Routledge.

2. Sharon J. Derry , Roy D. Pea , Brigid Barron , Randi A. Engle , Frederick Erickson , Ricki Goldman , Rogers Hall , Timothy Koschmann , Jay L. Lemke , Miriam Gamoran Sherin & Bruce L. Sherin (2010): Conducting Video Research in the Learning Sciences: Guidance on Selection, Analysis, Technology, and Ethics, *Journal of the Learning Sciences*, 19:1, 3-53
3. Corbin, J., & Strauss, A. (2008). Chapter 6 Memos and Diagrams. *Basics of qualitative research 3e. Los Angeles: Sage Publications.*

Suggested work this week: Make preliminary decisions about what type of analysis you are going to pursue and begin analysis. You may also want to “bind” your data set for this round of analysis.

Week 4 – 4/25 – Interaction Analysis

Required Readings:

1. Jordan, B., & Henderson, A. (1995). Interaction analysis: Foundations and practice. *The journal of the learning sciences*, 4(1), 39-103.
2. Sawyer, R.K. (2006). Analyzing Collaborative Discourse. In Sawyer, R. K. (Ed.). (2006). *The Cambridge handbook of the learning sciences* (Vol. 2, No. 5). Cambridge: Cambridge University Press.

Analysis Plan/Outline & Conjecture Map Due

Conduct Analysis!

Data Workshop Sharing: Bring Data and either a diagram or memo that you create that accompanies the data. Please bring 2- copies of the memo or diagram, we will workshop them in small groups.

Week 5 – 5/2: Tools, Materials, Tasks, and Artifacts

Required Readings:

1. Bell, P. (2000). Scientific arguments as learning artifacts: Designing for learning from the web with KIE. *International Journal of Science Education*, 22(8), 797-817.
2. Rosebery, A. S., Ogonowski, M., DiSchino, M., & Warren, B. (2010). “The coat traps all your body heat”: Heterogeneity as Fundamental to Learning. *The journal of the learning sciences*, 19(3), 322-357.

Suggested work this week: Draft Description of your learning design, methods, and data;

Continue analysis of data

Data Workshop Sharing: Bring Data and either a diagram or memo that you create that

accompanies the data. Please bring 2- copies of the memo or diagram, we will workshop them in small groups.

Week 6 – 5/9 – Examples of Case Studies

Required Readings:

1. Lee, C. D. (2001). Is October Brown Chinese? A cultural modeling activity system for underachieving students. *American Educational Research Journal*, 38(1), 97-141.
2. Enyedy, N. (2003). Knowledge construction and collective practice: At the intersection of learning, talk, and social configurations in a computer-mediated mathematics classroom. *The Journal of the Learning Sciences*, 12(3), 361-407.

Continue analysis of data

Data Workshop Sharing: Bring Data and either a diagram or memo that you create that accompanies the data. Please bring 2- copies of the memo or diagram, we will workshop them in small groups.

Suggested work this week: draft analytic procedures; Continue analysis of data.

Week 7 – 5/16 - Examples of Ethnographies

Required Readings:

1. Bricker, L. A., & Bell, P. (2012). "GodMode is his video game name": Situating learning and identity in structures of social practice. *Cultural Studies of Science Education*, 7(4), 883-902.
2. Kirshner, B. (2008). Guided participation in three youth activism organizations: Facilitation, apprenticeship, and joint work. *The Journal of the Learning Sciences*, 17(1), 60-101.

Data Workshop Sharing: Bring Data and either a diagram or memo that you create that accompanies the data. Please bring 2- copies of the memo or diagram, we will workshop them in small groups.

Week 8 – 5/23 – Examples of Microgenetic Analysis

Required Readings:

1. Rosenberg, S., Hammer, D., & Phelan, J. (2006). Multiple epistemological coherences in an eighth-grade discussion of the rock cycle. *The Journal of the Learning Sciences*, 15(2), 261-292.
2. Wagner, J. F. (2010). A transfer-in-pieces consideration of the perception of structure in the transfer of learning. *The journal of the learning sciences*, 19(4), 443-479.

Preliminary Analysis Draft

Data Workshop Sharing: Bring Data and either a diagram or memo that you create that accompanies the data. Please bring 2- copies of the memo or diagram, we will workshop them in small groups.

Week 9 – 5/30 - Mixed Qualitative and Quantitative

Required Readings:

1. Chi, M. T. (1997). Quantifying qualitative analyses of verbal data: A practical guide. *The journal of the learning sciences*, 6(3), 271-315.
2. Bang, M., & Medin, D. (2010). Cultural processes in science education: Supporting the navigation of multiple epistemologies. *Science Education*, 94(6), 1008-1026.

Two of your data groups drafts. Be prepared to provide written and verbal feedback in class.

Week 10 – 6/6 – Space and Place

Required Readings:

1. Leander, K. M., & Rowe, D. W. (2006). Mapping literacy spaces in motion: A rhizomatic analysis of a classroom literacy performance. *Reading Research Quarterly*, 41(4), 428-460.
2. Bang, M., Warren, B., Rosebery, A. S., & Medin, D. (2013). Desettling expectations in science education. *Human Development*, 55(5-6), 302-318.

Week 11 – 6/13 – Interactive Poster Session and Celebration

Interactive poster session & Final Paper Due

Administrative Notes about Teaching at the University of Washington

If you have any concerns about the course or your instructor, please see the instructor about these concerns as soon as possible. If you are not comfortable talking with the instructor or not satisfied with the response that you receive, you may contact Prof. Elham Kazemi (ekazemi@uw.edu) or Deborah McCutchens (mccutch@u.washington.edu).

If you are still not satisfied with the response that you receive, you may contact Dean Tom Stritikus, 221-4791, tstrit@u.washington.edu. For your reference these procedures are posted on the bulletin board just outside Student Services, 206 Miller.

If you would like to request academic accommodations due to a disability, please contact Disabled Student Services, 448 Schmitz, (206) 543-8924 (V/TTY). If you have a letter from Disabled Student Services indicating you have a disability that requires academic accommodations, please present the letter to the Area Secretary to discuss the accommodation you might need for class.