

## INST 7300: Research in Instructional Technology and Learning Sciences

Spring 2017

Thursdays, 1:30-4PM

EDUC 282

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### Instructor

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### Course Description

This course is intended to engage doctoral and other advanced students in Instructional Technology and Learning Sciences in rigorous examination of methodological approaches, theoretical constructs, and topic areas that are of great historical import or are currently being seriously explored in the areas of Instructional Technology and Learning Sciences. It is also a space to work more on additional discipline-specific research skills.

### Course Objectives

- Students will be able to identify theory or theoretical perspectives in a given research study
- Students will be able to explain the epistemological underpinnings and approaches associated with design-based research
- Students can describe current research related to online and technology supported teaching and learning and offer recommendations for promising directions for future research.
- Students will be able to identify two or more current topics of contemporary relevance to Instructional Technology or Learning Sciences and justify why those are of community interest.
- Students will demonstrate relative improvement in their individual ability to conceptualize, describe, or present scholarly research
- Students will think about their own theoretical framework, research questions, methods, and sample.

### Course Format

The course will meet weekly. **Face-to-face attendance is mandatory.** Conference calls or virtual attendance is reserved ONLY for emergency situations that cannot be avoided and are professionally *critical* or related to a personal emergency as would normally be recognized by the university (serious illness, death of a family member).

### Required textbooks and materials

There is one required text for the course:

Maxwell, J. (2013). *Qualitative Research Design: An interactive Approach*. Los Angeles: Sage.

Please note all assignments will be based on the pages in the 3<sup>rd</sup> edition:

<https://www.amazon.com/Qualitative-Research-Design-Interactive-Approach/dp/1412981190>

## Course Requirements

There are 3 types of assignments in this class.

1. **Reading Memo.** This is an informal individual assignment. 10% of grade.

Memos, sometimes called analytic memos, are extremely versatile tools that can be used for many different purposes (Maxwell, 2013). The purpose of these reading memos is to facilitate reflection and analytic insight. I want you to reflect on the main point of the articles, your thoughts about it, identify connections or implications to your own research or the future of the field. This only needs to be 1-3 short paragraphs per reading. I won't have you turn in memos for every reading. However, I hope that you get in the habit of writing memo's on every article you read.

Memos must be submitted electronically prior to the associated week's class meeting to receive credit. These memos should be reflective and thoughtful. They do not need to be prepared in APA style. They should not exceed 2 pages.

2. **Presentations.** This is a group assignment (2-3 people). 30% of grade.

Being able to communicate effectively is an important skill. These assignments are meant to provide deliberate practice of your presentation skills. In this class, there will be 1 group presentations and 1 individual presentation. The presentations are meant to be brief (15-20 minutes) and provide you with the opportunity to communicate about recent research in the Learning Sciences and Instructional Technology and as a result, learn from each other. You will read and present articles that you have not previously analyzed for another class or for an existing research project. In all instances, the article must be pre-approved by the instructor.

Presentation 1: Learning Sciences Methodologies Presentation. There are three chapters on methodologies used in the LS. Students will divide into 3 groups. Each group will read a different chapter and present it to the class.

Presentation 2: Students will present their final research idea taken from Exercise 7.1 in the Maxwell book.

Details on presentation and commentary guidelines are provided via Canvas.

3. **Researcher-in-Training Assignments.** This is an individual assignment. 50% of grade.

One of the most difficult steps of graduate school is coming up with research questions and deciding on your research topic. Regardless of whether you plan a qualitative or quantitative study, the exercises in the Maxwell book are designed to help you figure out who you are as a researcher and what you would like to research. Throughout the term, you will be given in-class guidance and then required to submit or present your own independent efforts related to the 6 exercises in the Maxwell book:

Researcher Identity Memo

- Exercise 3.1: Creating a Concept Map for your study (p.62)
- Exercise 4.1: Developing your research questions (p.84)
- Exercise 5.2: Questions and Methods Matrix (p.119)
- Exercise 6.1: Dealing with Validity Threats (p.136)
- Exercise 7.1: Developing a proposal argument (p.158)

All assignments will be turned in through the Canvas submission system.

**Late submissions**

Late assignments *will not* be accepted except only in the case of a personal or family emergency.

**Grading scale**

There is no curve for the class. Grades will be assigned based on the scale below.

Reading Memos	10%
Presentations	30%
RiT Assignments	50%
Participation	10%

**Plagiarism**

As stated in the USU Student Code, plagiarism is “the act of representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes using materials prepared by another person or by an agency engaged in the sale of term papers or other academic materials.” Plagiarism is harmful both for the author of the original work and for the plagiarizer. Any individuals involved in plagiarizing work will receive an automatic fail for the assignment or project and will be immediately reported to the university administration. You also are not permitted to submit work previously completed for another course or other project for this course.

**Persons with Disabilities**

Students with documented disabilities who are in need of academic accommodations should immediately notify the instructor and/or contact the Disability Resource Center at (435) 797-2444 and fill out an application for services. Accommodations are individualized and in accordance with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1992.

**Incompletes**

In accordance with University policy, incompletes are not to be given for poor performance. There will be no incompletes given except for conditions beyond the student's control, including:

- Incapacitating illnesses that prevent a student from attending classes for a period of at least two weeks
- A death in the immediate family

- Financial responsibilities requiring a student to alter course schedule to secure employment
- Change in work schedule as required by an employer

Other, *unexpected* emergencies may be considered on a case-by-case basis. Regardless of the cause for the incomplete, appropriate documentation of the circumstance is required for an extension to be considered.

### Course Topics

Date	Topic	Readings	Assignments Due
1/12	Intro	Maxwell, Chapter 1 Hoadley, 2004	
1/19	DBR- seminal articles	Brown, 1992 Collins, 1992	Reading Memo
1/26	DBR- defined more clearly	Maxwell, Chapter 2 Collins et al, 2004	Reading Memo
2/2*	Research @ Library. Meet Teagan Eastman in Room 204 in Merrill-Cazier Library.	Maxwell, Chapter 3	Researcher Identity Memo (exercise 2.1, p.34-35 Maxwell).
2/9	Recent examples of DBR.	Collins and Brown wrote their seminal articles in 1992. How are people using DBR today? This week, you will partner with another student and select an article from the list provided in Canvas. In pairs, you will present the article to the class. See the module page for details and readings at the end of the syllabus.	Reading memo Be prepared to present your article in small groups (Jigsaw)
2/16	Learning Analytics/Educational Datamining	Baker & Siemens (2014) Recent article of choice. You will partner and present an article. See module page for details	Exercise 3.1 due: concept map and memo explaining it Be prepared to present your article in small groups (Jigsaw)
2/23	Methodologies in the Learning Sciences Part 1	Maxwell Chapter 4 Class will divide into 3 groups. Each will read and present 1 LS Methods Chapter.	Revised concept map and memo after feedback

<b>Date</b>	<b>Topic</b>	<b>Readings</b>	<b>Assignments Due</b>
		See module for details.	Group Presentations of LS methods
3/2	Methodologies in the Learning Sciences Part 2	Presentations will be spread over 2 classes so that we can do other work in class. Groups only read 1 and present 1 chapter.	Exercise 4.1 due: RQ Group Presentations of LS methods
~Spring Break~			
3/16	Cyberlearning & CSCL	Maxwell, Chapter 5 Recent CSCL article. Students will pair up and read and present a recent article from the IJCSCL. See module for details	Reading memo Be prepared to present your article in small groups (Jigsaw)
3/23	Contemporary Research in JLS	Maxwell, Chapter 5 Students will pair up and read and present a recent article from the JLS. See module for details	Reading memo Be prepared to present your article in small groups (Jigsaw)
3/30	Computational Thinking	Wing (2006) Grover & Pea (2013)	Exercise 5.2 due
4/6	Lit Review Part 1	Maxwell Chapter 6 Kamler and Thomson (2006)	
4/13	Lit Review Part 2	Maxwell Chapter 6 Look at RER: Review of Education Research. Look at some examples of lit reviews.	Exercise 6.1 due  Be prepared to present your article in small groups
4/20	Learning by Making	Maxwell Chapter 7 Optional readings	Optional memo
4/27	Final Class		Exercise 7.1 due, Individual Presentation

\*Please note we will not meet in 282 EDU on this day. We will meet in the library.

## Readings Week 5: Recent Examples of DBR

This is a group assignment. Find a partner and pick one of the 8 articles to present. One article per group. You must get approval first to ensure each group is reading a different article.

[Cole, M., & Packer, M. \(2016\). Design-Based Intervention Research as the Science of the Doubly Artificial. \*Journal of the Learning Sciences\*, \(just-accepted\).](#)

This article uses a variety of principles of cultural-historical activity theory to extend Herbert Simon's (1996) insight into the inherent linkage between the creation of artifacts and design. We argue that design research must grapple with the doubly artificial, as the classrooms in which many educational designs are implemented are themselves already artificial and contingent—the products of design—and the learning that is the focus of investigation is already an adaptation to the classroom environment and so artificial. Focusing our discussion on the mesogenetic character of the temporal characteristics of typical educational design-based intervention research, we present an example of an 18-year-long life span of an intervention that was initially expected to last 3 or 4 years. Crises late in the life of the system, 1 of which rescued the system, 1 of which terminated it, documented through field notes written by undergraduate participants, provide evidence for the dynamics of the system's internal functioning in relation to events occurring in the larger ecology of which it was a part.

[Severance, S., Penuel, W. R., Sumner, T., & Leary, H. \(2016\). Organizing for teacher agency in curricular co-design. \*Journal of the Learning Sciences\*, 25\(4\), 531-564.](#)

Cultural-historical activity theory (CHAT) approaches to intervention aim for transformative agency, that is, collective actions that expand and bring about new possibilities for activity. In this article, we draw on CHAT as a resource for organizing design research that promotes teachers' agency in designing new science curriculum materials. We describe how CHAT informed our efforts to structure a collaborative design space in which teachers and other participants sought to develop new curriculum materials intended to help realize a new vision for science education. Specifically, we describe the tools and routines we deployed to support the design process, and we analyze the ways in which teachers took up elements of our design process as well as how they adapted, resisted, and suggested alternative tools and strategies to help develop new curriculum materials. In so doing, we illustrate ways in which CHAT can serve as a guide both for organizing collaborative design processes and for analyzing their efficacy.

[Gutiérrez, K. D., & Jurow, A. S. \(2016\). Social design experiments: Toward equity by design. \*Journal of the Learning Sciences\*, 25\(4\), 565-598.](#)

In this article, we advance an approach to design research that is organized around a commitment to transforming the educational and social circumstances of members of non-dominant communities as a means of promoting social equity and learning. We refer to this approach as social design experimentation. The goals of social design experiments include the traditional aim of design experiments to create theoretically grounded and practical educational interventions, the social agenda of ameliorating and redressing historical injustices, and the development of theories focused on the organization of equitable learning opportunities. To illustrate how we use social design methodology, we present two examples that strategically reorganized the sociohistorical practices of communities to expand learning as a key goal. We conclude with a discussion of the opportunities this approach creates for learning scientists to form effective research partnerships with community members, as well as the responsibilities it entails for creating a more just society.

[Sannino, A., Engeström, Y., & Lemos, M. \(2016\). Formative interventions for expansive learning and transformative agency. \*Journal of the Learning Sciences\*, 25\(4\), 599-633.](#)

This article examines formative interventions as we understand them in cultural-historical activity theory and reflects on key differences between this intervention research tradition and design-based research as it is conceived in the learning sciences tradition. Three projects, including 2 Change Laboratories, are analyzed with the help of conceptual lenses derived from basic epistemological principles for intervention research in activity theory. In all 3 interventions, learners expansively transformed the object of their activity. The

Change Laboratory cases, however, show that this learning process included productive deviations from the researchers' instructional intentions, leading to significant outcomes, both practical and theoretical, that were not anticipated by the interventionists. Together these cases illustrate that an activity-theoretical formative intervention approach differs from design-based research in the following ways: (a) formative interventions are based on design done by the learners; (b) the collective design effort is seen as part of an expansive learning process including participatory analyses and implementation phases; (c) rather than aiming at transferable and scalable solutions, formative interventions aim at generative solutions developing over lengthy periods of time both in the researched activities and in the research community.

Easterday, M., Rees Lewis, D., & Gerber, E. (2014). Design-based research process: Problems, phases, and applications. In Proc. of International Conference of Learning Sciences (Vol. 14).

Since the first descriptions of design-based research (DBR), there have been continued calls to better define DBR and increase its rigor. Here we address four uncertainties about DBR: (a) the phases of the DBR process, (b) what distinguishes DBR from other forms of research, (c) what distinguishes DBR from design, and (d) the characteristics of DBR that make it effective for answering certain types of questions. We build on existing efforts by defining DBR as an iterative process of 6 phases: focus, understand, define, conceive, build, and test, in which other scientific processes are recursively nested. By better articulating the process of DBR, this definition helps us to better craft, improve, communicate, and teach design-based research.

[Sandoval, W. \(2014\). Conjecture mapping: An approach to systematic educational design research. Journal of the Learning Sciences, 23\(1\), 18-36.](#)

Design research is strongly associated with the learning sciences community, and in the 2 decades since its conception it has become broadly accepted. Yet within and without the learning sciences there remains confusion about how to do design research, with most scholarship on the approach describing what it is rather than how to do it. This article describes a technique for mapping conjectures through a learning environment design, distinguishing conjectures about how the design should function from theoretical conjectures that explain how that function produces intended outcomes.

[Anderson, T., & Shattuck, J. \(2012\). Design-based research a decade of progress in education research?. Educational researcher, 41\(1\), 16-25.](#)

Design-based research (DBR) evolved near the beginning of the 21st century and was heralded as a practical research methodology that could effectively bridge the chasm between research and practice in formal education. In this article, the authors review the characteristics of DBR and analyze the five most cited DBR articles from each year of this past decade. They illustrate the context, publications, and most popular interventions utilized. They conclude that interest in DBR is increasing and that results provide limited evidence for guarded optimism that the methodology is meeting its promised benefits.

[Zheng, L. \(2015\). A systematic literature review of design-based research from 2004 to 2013. Journal of Computers in Education, 2\(4\), 399-420.](#)

Design-based research (DBR) that blends designing learning environments and developing theories has proliferated in recent years. In order to gain insights into DBR, 162 studies related to DBR published from 2004 to 2013 were selected and reviewed. The major findings indicated that most of the studies focused on designing, developing, and redesigning learning environments through interventions. However, how to revise the intervention was not specified in detail. Also, the testing of an intervention was found to be still dependent on the measurement of cognitive outcomes. Furthermore, it was found that most DBR only conducted one cycle of iteration. This review of research not only identifies the progress of DBR, but also provides future directions of DBR for researchers and practitioners.