Research and evaluation of educational technology

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**Educational Technology 0858-618, Spring 2012**

**Keywords:** research methods, good questions, design research, ethnography, statistics, quantitative research, epistemology, technology research, mixed methods, action research

**Description:** In this course, students investigate methods for determining if a given technology contributes to a stronger educational experience. Reviewing the body of research on educational technology, students will probe the merits of different methodologies. Students learn how to develop good research questions and choose methodologies to conduct their own investigations.

## Goals

**Spring 2013 Seminar Topic: Girls & Programming**

This research seminar exposes students to the general methods of social science research used in education settings as well as to the specific research paradigms common to technology research. They need these skills to be effective consumers of research; to make informed technology choices and to stay abreast of current trends. Further, they will be able to develop methodologically sound frameworks to test and evaluate the effectiveness of their own technology initiatives in the field.

This course has two main goals:

1. to develop students’ abilities to read and write about scholarly research in the area of educational technology, and
2. to foster their ability to conduct formal academic research and less formal evaluations of educational technology.

Students will be able to:

* read common statistical terms and measures (e.g. ANOVA)
* comprehend the major trends and questions in educational research, with a focus on technology
* use data mining and business intelligent techniques to spot trends in data and implement continuous improvement
* read and evaluate qualitative educational research
  + ethnographic approaches
  + interviews
  + action research and design research
  + conversation and discourse analysis
  + mixed methods
* implement online surveys
* use digital tools for analyzing data (spreadsheets, SPSS, SQL databases)
* use digital tools for visualizing and reporting numerical information
* design measures to evaluate the success of technology initiatives

## Online Resources

* Celly: <http://cy.tl/UlBZ4q>
* Course Wiki <http://aws.curinga.com/wiki>
* Zotero Group: Girls, Women & Computer Science <https://www.zotero.org/groups/girls_women__computer_science>
* Google Scholar <http://scholar.google.com>
* Adelphi Libraries <http://libraries.adelphi.edu>

## Required texts

*None*

## Bibliography & readings

Baker, R. S.J.D. 2009. The state of educational data mining in 2009: A review and future visions. *Journal of Educational Data Mining*, *1* (*1*)3–17.

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Haertel, Geneva D. 2003. *Evaluating Educational Technology: Effective Research Designs for Improving Learning.* Teachers College Press. ISBN 0807743305.

Haslanger, S., Tuana, N., & O’Connor, P. (2012). [Topics in Feminism](http://plato.stanford.edu/archives/win2012/entries/feminism-topics/). In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2012.).

Kelly, A. 2004. Design research in education: Yes, but is it methodological? *Journal of the Learning Sciences*, *13* (*1*)115–128.

Ladson-Billings, G (ed.). 2006. *Education research in the public interest: Social justice, action, and policy.* New York NY: Teachers College Press. ISBN 0807747041.

McMillan, James H. 2007. *Educational Research: Fundamentals for the Consumer (5thEdition).* Boston MA: Allyn & Bacon. ISBN 0205508308

NSF. (n.d.). [Women, Minorities, and Persons with Disabilities in S&E](http://www.nsf.gov/statistics/women/). US National Science Foundation (NSF).

Reeves, T. C. 2005. Design research: A socially responsible approach to instructional technology research in higher education. *Journal of Computing in Higher Education*, *16* (*2*)96–115.

Tufte, E. 2006. *Beautiful Evidence.*Graphics Press. ISBN 0961392177.

Tufte, E. 1997. *Visual & Statistical Thinking: Displays of Evidence for Decision Making.*Graphics Press. ISBN 0961392134.

Willis, Jerry. 2008. *Qualitative research methods in education and educational technology.*Information Age Publishing. ISBN 9781930608542.

## Class Sessions

### Ways of knowing

### Types of research

#### Readings due:

Haslanger, S., Tuana, N., & O’Connor, P. (2012). [Topics in Feminism](http://plato.stanford.edu/archives/win2012/entries/feminism-topics/). In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (Winter 2012.).

NSF. (n.d.). [Women, Minorities, and Persons with Disabilities in S&E](http://www.nsf.gov/statistics/women/). US National Science Foundation (NSF).

Haraway, D. (1988). [Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective](http://www.staff.amu.edu.pl/~ewa/Haraway,%20Situated%20Knowledges.pdf). *Feminist Studies*, *14*(3), 575–599. doi:10.2307/3178066

#### Assignments Due:

* Create an account on [Zotero](http://zotero.org)
* Set up Zotero on your computer
* Add 2 good and relevant scholarly sources to our group: [Girls, Women & Comp. Sci](https://www.zotero.org/groups/girls_women__computer_science)

### Quantitative Research

#### Readings due:

Boote, D. N. 2005. Scholars before researchers: On the centrality of the dissertation literature review in research preparation. *Educational Researcher*, *34* (*6*)3.

### Participants and subjects

### Survey-based research

### Experimental design

### Qualitative Research

### Action Research & Design Research

### Case Studies & Ethnogrpahy

### Research ethics

### Research Design Workshop 1

### Research Design Workshop 2

### Data and continuous improvement

### Final presentations

Students will present their research designs and receive feedback from the instructor and their peers.

## Assignments and Grades

### Assignment 1 — Review of literature (40%)

This semester, we will collaboratively author a “review of literature” related to gender studies of teaching computer science and related engineerign topics.

Through this assignment, students will be evaluated on their ability to understand, analyze, and synthesize research from a range of sources using a variety of research methodologies.

Collaboratively we will create an outline and scope for the review. Individual studentst will be responsible for sub-topics within the report. The group will share responsibility for editing and revising the document.

**The final report will be completed by session 6.**

## Assignment 2 — Research design & Pilot (60%)

For the final assignment, each student will develop a novel research study to explore an area of educational technology. Students will be encouraged to develop research that they can implement in their current work positions or in their upcoming fieldwork. The research design will be evaluated on:

* the importance of the research question
* the clarity of the proposed study
* the appropriateness of the methodology chosen
* the feasibility of the study

**Due dates:**

* hypothesis & research question(s): session 7
* research proposal/protocol: session 10
* results: final session