

CSTE 7380  
Instructional Technology Research Methods  
Fall 2017

**Instructor Contact Information**

Name: Dr. Peter A. Cooper  
Office: AB1 Room 214C  
Email: cooper@shsu.edu  
Phone: 936.294.1569  
Skype: peter.cooper

**Required Text**

Cohen, L. Manion, L & Morrison, K Research Methods in Education. 7<sup>th</sup> Ed. ISBN13: 978-0-415-58336-7. The book also has a Kindle edition and can be rented for under \$15. A prior version of the text is available as a free University e-book.

**Required Tools**

- Reliable Internet Connection with access to SHSU Blackboard
- Familiarity with, and access to Microsoft Office products, in particular MS-Word, Excel, and PowerPoint
- Electronic access to SHSU's Newton Gresham Library.
- Zoom

**Optional Tools**

- Skype and/or Facetime
- Google Hangouts

**Course Description**

**This course focuses on the research questions, approaches, and measures typically employed by instructional technology researchers. Credit: 3.**

This course is designed specifically for graduate students in the EdD in Instructional Technology. The course provides an in-depth examination of research concepts, methodologies, tools, and analytic processes, as they apply to instructional technology research. The course requires significant reading and writing, and focusses on the development of research design skills and decision making.

The course requires the development of a research proposal that, in an ideal situation, will align closely with potential dissertation research later in the degree program.

**Online Course Management**

This course is an online course. As such it does not rely on a traditional didactic approach to information dissemination. Students are expected to participate in seven synchronous online sessions, to engage in self-motivated learning and research, and to support each other through constructive criticism and resource sharing.

Taking an online research methods course is a challenge. It is important that students approach the course with a positive and energetic attitude.

## **Course Goals**

1. Developing your understanding of diverse philosophical, conceptual, and procedural approaches to research design
2. Developing your skill in identifying and classifying appropriate research literature
3. Developing your skill in interpreting research methodologies in existing research and their appropriate application and implementation
4. Developing your skill in developing a research proposal

## **Course Objectives**

At the end of this course the ideal student will be able:

1. Discuss the philosophical bases for educational research
2. Describe real-world educational problems and derive appropriate research questions and hypotheses to address those problems
3. Distinguish between quantitative, qualitative, and mixed methods approaches to education research
4. Describe specific research designs and provide situations in which they are appropriately utilized
5. Describe, evaluate, and categorize existing educational research literature.
6. Describe methods of data collection and their attributes
7. Identify appropriate measurement scales and procedures for scoring/recording data
8. Identify and describe appropriate sampling techniques
9. Describe mechanisms to test for and ensure reliability and validity
10. Identify the ethical and legal environment association with instructional technology research
11. Describe the process of developing a research proposal

## **Student Competencies**

1. Research Methods Competencies
  - a. Locate, summarize, and categorize existing instructional technology research
  - b. Formulate testable hypotheses from a research question
  - c. Apply appropriate research methodologies to test hypotheses
  - d. Distinguish between independent, dependent, extraneous, and confounding variables
  - e. Apply techniques for operationalizing variables
  - f. Construct and apply tests to evaluate internal, external, construct, and statistical validity in quantitative research
  - g. Construct and apply tests to evaluate descriptive, interpretive, theoretical, internal and external validity in qualitative research
  - h. Design instruments to collect research data
  - i. Identify types of variables and data
  - j. Identify appropriate statistical tests for specific research methodologies
  - k. Explain the limitations of generalization from the results of research
2. Technology Competencies
  - a. Use Microsoft Word to develop APA compliant documents
  - b. Use Microsoft Excel to perform basic statistical analyses and graphical data representations
  - c. Use NGL Library electronic resources to identify research literature
  - d. Use NGL Library research resources to develop annotated bibliographies and citations
  - e. Utilize electronic systems to store, analyze, and interpret research data
3. Ethical Competencies
  - a. Identify potential ethical, political, and legal concerns associated with a research design
  - b. Describe approaches to managing ethical concerns in human subjects research
  - c. Develop and submit a successful research proposal to the University's Institutional Review Board
  - d. Describe ethical, political, and legal concerns associated with electronic research
  - e. Describe ethical concerns in preparing research reports

#### 4. Research Communication Competencies

- a. Provide constructive criticism of writing to peers in the course
- b. Collaborate with peers in identifying appropriate research reports
- c. Critique research reports, from government agencies, research institutes, and academic journals.
- d. Present a summary of a research proposal

#### Teaching Strategy

You are all doctoral students, and, as such, will be experiencing a very different approach to instruction in this class. I do not intent to use lectures as the primary instructional method. Instead, I will direct you to address grand challenges, where you are provided with an end goal, and you need to map your own path to achieving that goal.

We will have synchronous evening sessions every other week, providing you an opportunity to

Ask questions if you are experiencing a problem or need clarification

Provide information to classmates to support their development of solutions to the grand challenges

#### Course Content

- Week 1: Aug 23-27  
Introduction, Syllabus, Expectations  
Reading: Course text pp 1-29.  
Reading: Latham G. & Carr, N. Authentic learning for pre-service teachers in a technology-rich environment. *Journal of Learning Design*. 2015 Vol 8 Issue 3, p67-77.  
Reading: Tatar, E., Zengin, Y, & Kagizmanli, T. What is the relationship between technology and mathematics teaching anxiety? *Journal of Educational Technology & Society*. 2015. Vol 18(1) pp67-76.  
Reading: Leinonen, T., Keune, A., Vermaans, M., & Toikkanen, T. Mobile apps for reflection in learning: a design research in K-12 education. 2016. *British Journal of Educational Technology*. Vol 47(1). Pp 182-202.  
Assign: Download and install Zotero. Develop annotated bibliographies for this week's readings. Compare and contrast with peers in blackboard discussion group.
- Week 2: Aug 28-Sept.2. Critical Educational Research, Evaluation, Causation  
Reading: Course text. pp 31 – 71.  
Reading: Huat See, B., & Gorard, S. (2015). The role of parents in young people's education—a critical review of the causal evidence. *Oxford Review Of Education*, 41(3), 346-366.  
Reading: Hayward, E. e. (2012). Evaluating measurement tools in science education research. *Cultural Studies Of Science Education*, 7(4), 979-983.  
Reading: de Lange, N. N., Mitchell, C. C., & Moletsane, R. M. (2015). Editorial: Critical perspectives on digital spaces in educational research. *Perspectives In Education*, 33(4), 1-5  
Reading: Bleske-Rechek, A., Morrison, K. M., & Heidtke, L. D. (2015). Causal Inference from Descriptions of Experimental and Non-Experimental Research: Public Understanding of Correlation-Versus-Causation. *Journal Of General Psychology*, 142(1), 48-70.  
Assign: Develop annotated bibliographies for this week's readings. Compare and contrast with peers in blackboard discussion group.  
Session: Synchronous session
- Week 3: Sept 3 - 9. Ethics  
Reading: Course text pp 73 – 112

Readings: Identify four research publications through SHSU's Engine Orange (Library Electronic Search system) with relevance to the following topics:

Ethics in Educational Research

Designing Research Questions in Educational Technology

Assign: Locate the Institutional Review Board (IRB) portion of the SHSU website and determine the procedure necessary for a graduate student to obtain authorization to conduct a survey of SHSU students.

Develop annotated bibliographies for this week's readings. Compare and contrast with peers in blackboard discussion group.

Week 4: Sept 10-16. Planning Educational Research

Reading: Course text pp 115 – 214

Reading: Borrego, M., Foster, M. J., & Froyd, J. E. (2014). Systematic Literature Reviews in Engineering Education and Other Developing Interdisciplinary Fields. *Journal Of Engineering Education*, 103(1), 45-76.  
doi:10.1002/jee.20038

Assign: For a field of potential research interest to you, describe the area of interest, derive two possible research questions you might investigate, describe how you might operationalize those research questions. Identify the research methodology you consider most appropriate for your research questions and explain your reasoning.

Session: Synchronous session

Week 5: Sept 17-23. Styles of Educational Research, Part I

Reading: Course text pp. 217 – 254

Assign: For your specific area of research interest identify 3 research articles that use a naturalistic, qualitative or ethnographic research style. Develop annotated bibliographies.

For your specific area of research interest identify 3 research articles that use a historical/documentary research style. Develop annotated bibliographies.

Week 6: Sept 24-30. Styles of Educational Research, Part 2

Reading: Course text pp. 256-302

Assign: For your specific area of research interest identify 3 research articles that use a survey/ longitudinal/trend research style. Develop annotated bibliographies.

For your specific area of research interest identify 3 research articles that use a case study research style. Develop annotated bibliographies.

Session: Synchronous session

Week 7: Oct 1-7. Styles in Educational Research, Part 3

Reading: Course text pp 303-374

Assign: For your specific area of research interest identify 2 research articles that use an ex post facto research style. Develop annotated bibliographies.

For your specific area of research interest identify 2 research articles that use an ex post facto research style. Develop annotated bibliographies.

For your specific area of research interest identify 2 research articles that use an experimental or quasi experimental research style. Develop annotated bibliographies.

For your specific area of research interest identify 2 research articles that use a meta-analysis research style. Develop annotated bibliographies.

For your specific area of research interest identify 2 research articles that use an Action Research style. Develop annotated bibliographies.

- Week 8: Oct 8-14. Instrumentation Part 1  
Reading: Course text pp 375-442  
Assign: Prepare an outline of a potential research proposal. A rubric for the outline will be provided in Blackboard but should include, at minimum, your research question(s), operationalized questions, hypotheses, null hypotheses, identification and justification of your proposed research style, and identification and justification of your proposed data collection instrument.  
Session: Synchronous session
- Week 9: Oct 15-21. Instrumentation Part 2  
Reading: Course text pp 444-494  
Assign: Using feedback from the synchronous session, update your research proposal and prepare an IRB submission of the research proposal.
- Week 10: Oct 22-28. Instrumentation Part 3  
Reading: Course text pp 496-533  
Assign: Using your research proposal as the basis, identify 2 research articles that utilize questionnaires for data gathering. Prepare annotated bibliographies.  
Using your research proposal as the basis, identify 2 research articles that utilize interviews for data gathering. Prepare annotated bibliographies.  
Using your research proposal as the basis, identify 2 research articles that utilize accounts for data gathering. Prepare annotated bibliographies.  
Session: Synchronous session
- Week 11: Oct 29-Nov 4 Data Analysis Part 1  
Reading: Course text pp. 535-572  
Assign: Using your research proposal as the basis, identify 2 research articles that utilize observation for data gathering. Prepare annotated bibliographies.  
Using your research proposal as the basis, identify 2 research articles that utilize parametric for data gathering. Prepare annotated bibliographies.  
Using your research proposal as the basis, identify 2 research articles that utilize non-parametric tests for data gathering. Prepare annotated bibliographies.
- Week 12: Nov 5-11. Data Analysis Part 2  
Reading: Course text pp 574 – 620  
Assign: Using your research proposal as the basis, identify 2 research articles that utilize personal constructs for data gathering. Prepare annotated bibliographies.  
Using your research proposal as the basis, identify 2 research articles that utilize role-playing for data gathering. Prepare annotated bibliographies.  
utilize questionnaires for data gathering. Prepare annotated bibliographies.  
Session: Synchronous session
- Week 13: Nov 12-18. Data Analysis Part 3  
Reading: Course text pp 622-695  
Assign: Utilizing your research proposal as a basis, identify and justify the appropriate statistical test to analyze your potential data
- Week 14: Thanksgiving. No Activity
- Week 15: Nov 26-Dec 2. Data analysis Part 4.  
Reading: Course text pp 697-699  
Assign: No assignment this week (really? You sure?)

## Grading Scheme

- Total 1000 points

A 900 +  
B 800-899  
C 700-799  
D 600-699  
E ≤ 600

Students with disabilities covered by the Americans with disabilities Act should go to the Counseling Center and Services for Students with Disabilities (SSD) in a timely manner to obtain the documentation required. Students are responsible for initiating the process of documenting the need for an accommodation under the ADA act.