MTE 655: Developing Research Skills Part 1

Lecturer: Camille S. Burnett-Bradshaw
Location: Tuesday, 4:00 – 6:30pm, Fairhaven 156
Contact: cburnett@umassd.edu
Office Hours: Tuesdays, 6:30pm – 7:30pm
Wednesdays, 4:30pm – 5:30pm (via phone – 617-834-0623)

Abstract
This course will focus on building the skill set necessary to conduct research. It will include the exploration, analysis, synthesis, and writing skills critical to the research process. It will also address ethics of research, including issues associated with research on human subjects. As part of the course, students will be introduced to funding resources, and will be expected to identify a problem for which they will conduct a pilot study during the Introductory and Preparatory phases of the program (Years 1 and 2), as well as write a sample grant proposal for their pilot study.

Learning Objectives
• To develop a toolkit of qualitative and quantitative data collection methods;
• To explore the relationship of research questions to a research agenda and the methods used;
• To develop a coherent approach for conducting research around a specific question;
• To further develop understandings of ethical standards for research; and
• To further technical writing abilities related to producing research in mathematics education.

Textbooks
Required:

Additional Resources:

**Course Requirements and Policies**

**In-class participation (20%).**

The format of the class will be a combination of lecture presentation and whole class discussion. Students will be expected to attend all classes and complete all assigned readings and homework assignments prior to class. (Please notify me in advance regarding extenuating circumstances.)

**Homework assignments (40%).**

Written homework assignments are of three types. The first type is intended to synthesize readings and material learned in class. The second type is intended as drafts for each section of your final project. The third type is intended as reflections of readings, material learned in class, or the former types of assignments, and should be a maximum of two-pages double spaced. (Please see [http://www.umassd.edu/studenthandbook/academicregs/ethicalstandards.cfm](http://www.umassd.edu/studenthandbook/academicregs/ethicalstandards.cfm) for a statement on the university’s policy on academic dishonesty, including plagiarism.)

**Final project (40%).**

The final project will be a grant proposal for your pilot study. It is due on Friday, May 15 at 5:00pm. (Your final project must conform to APA 6th edition format, as well as the guidelines set forth by your funding agency.)

You will:

- Select a topic (You should be using the topic determined in MTE 654);
- Select a funding agency;
- Create a draft of each section of your paper as per various homework assignments throughout the semester;
- Present your proposal to your classmates on May 10;
- Revise your proposal as necessary; and
- Submit a final draft of your proposal on May 15.
## Course Calendar

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<th>Date</th>
<th>Topic</th>
<th>Readings</th>
<th>Assignment Due</th>
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| **Tuesday, 01/25** | Introduction Proposals Ethics in Research | AERA Dissertation Grants Call for Proposals [http://www.aera.net/grantsprogram/res_training/diss_grants/DGFly.html](http://www.aera.net/grantsprogram/res_training/diss_grants/DGFly.html)  
Creswell: Writing Strategies and Ethical Considerations (pp. 73-94)  
APA: Writing for the Behavioral and Social Sciences (pp. 9-20) | Reflection: Compare each RFP |
| **Tuesday, 02/01** | Research Designs | Creswell: Selection of Research Design (pp. 3-21)  
Maxwell: Why do this study? (pp 15-32)*  
| **Tuesday, 02/08** | Research Questions | Creswell: Research Questions and Hypotheses (pp. 129-143)  
Maxwell: Research Questions (pp. 65-78)*  
Katzer, Cook, & Crouch: What is Being Studied? (pp. 75-91) | Draft: Creswell: p. 142: Question 1, 2 or 3 |
| **Tuesday, 02/15** | Review of Literature | Creswell: Review of the Literature (pp. 23-47)  
Galvan: Writing Literature Reviews | Synthesis: Creswell: p. 46: Question 1 |
| **Tuesday, 02/22** | No Class: Follow Monday’s Schedule | N/A | N/A |
| **Tuesday, 03/01** | Qualitative Methods – Interviewing | Creswell: Qualitative Procedures (pp. 173-202)  
Seidman: Chapters 1, 2, 3, 4, & 6 (skim 4 & 6) | Synthesis: Write a sample interview protocol |
| **Tuesday, 03/08** | Qualitative Methods – Observations and Audio-Visual Materials | Merriam: Being a Careful Observer pp 87-103**  
Erickson: Definition and Analysis of Data from Videotape: Some Research Procedures and Their Rationales (pp 177-191)**  
Hall: Videorecording as Theory (pp. 647-664)**  
Roschelle: Choosing & Using Video Equipment for Data Collection (pp. 709-731) | Synthesis: Conduct the interview  
Reflection: Compare an observation to a video recording to an interview |
| **Tuesday, 03/15** | Qualitative Methods – Documents Quantitative Methods – Surveys and Experiments | Merriam: Mining Data from Documents, pp 104-118**  
Creswell: Quantitative Methods, pp 145-170  
Scheuren: What is a Survey PDF pamphlet** | Synthesis: Conduct an observation  
Synthesis: Create a survey with 5-10 questions |
<p>| <strong>Tuesday, 03/22</strong> | No Class: Spring Vacation | N/A | N/A |
| <strong>Tuesday, 03/29</strong> | Clinical Interviews | Ginsburg: chapters 2-4 (pp. 30-115) | Reflection: Compare a semi-structured/structured interview to a clinical interview |</p>
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<tr>
<td>Tuesday, 04/05</td>
<td>Teaching Experiments</td>
<td>Handbook of Research Design in Mathematics and Science Education</td>
<td>Draft: Creswell: p. 169: Question 1 or 2, or p. 202: Question 1</td>
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<td>- Ch 11 (Steffe &amp; Thompson) pp 267-306*</td>
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<td>- Ch 12 (Cobb) pp 307-333*</td>
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<td>- Ch 13 (Simon) pp 335-359* (optional)</td>
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<td>Tuesday, 04/12</td>
<td>Mixed Methods</td>
<td>Creswell: Mixed Method Procedures (pp. 203-225)</td>
<td>Reflection: Compare qualitative, quantitative, and mixed methods</td>
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<td>Does it Work materials*</td>
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<td>Tuesday, 04/19</td>
<td>Proposals - Refining the Research Process for the Funder &amp; Turning a Proposal into Articles</td>
<td>Mewborn materials*</td>
<td>Reflection: Identify the research question, consider the methodology, and examine the use of the literature.</td>
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<td>Tuesday, 04/26</td>
<td>Proposals - Quantitative studies in grant proposals and research papers</td>
<td>COSMIC materials*</td>
<td>Draft: Creswell: p. 46: Question 2</td>
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<td>Reflection: Identify the research question, consider the methodology, and examine the use of the literature.</td>
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<td>Tuesday, 05/03</td>
<td>Proposals - Adhering to and Diverging from the Proposal</td>
<td>CoSTAR materials*</td>
<td>Reflection: Identify the research question, consider the methodology, and examine the use of the literature.</td>
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<td>Tuesday, 05/10</td>
<td>Class Presentations and Review of Proposals</td>
<td>N/A</td>
<td>Presentations</td>
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<td>Friday, 05/15</td>
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<td>Final Project Due by 5:00pm</td>
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