

MATH 5392: Qualitative Research in Mathematics Education
Spring 2019

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Office Hours: Mondays 2:00 – 3:00, Thursday 1:00 – 2:00, or by arrangement

Section Information: MATH 5392-001

Time and Place of Class Meetings: Online format – all course information and activities will occur on Blackboard (elearn.uta.edu)

Description of Course Content: This course will explore the qualitative research technique of case study, and examine applications of case studies in mathematics education research, including some seminal articles in mathematics education research literature.

Student Learning Outcomes: Upon successful completion of this course, you will be able to:

1. Understand the elements of case study research design and know its appropriate evaluation criteria
2. Understand the advantages, challenges, and limitations of case study research
3. Interpret and critique existing mathematics education case study research and describe it clearly
4. Understand the relationship between case study research and theory development

Required Textbook:

- Yin, R. K. (2017). *Case study research and applications: Design and methods*. Sage publications.

Bibliography (tentative menu):

Borko, H. (2004). Professional development and teacher learning: Mapping the terrain. *Educational researcher*, 33(8), 3-15.

Bower, H., & Griffin, D. (2011). Can the Epstein model of parental involvement work in a high-minority, high-poverty elementary school? A case study. *Professional School Counseling*, 15(2), 77-87.

Bowers, J., Cobb, P., & McClain, K. (1999). The evolution of mathematical practices: A case study. *Cognition and instruction*, 17(1), 25-66.

Brookhart, S. M., Andolina, M., Zuza, M., & Furman, R. (2004). Minute math: An action research study of student self-assessment. *Educational studies in Mathematics*, 57(2), 213-227.

Cobb, P. (1995). Cultural tools and mathematical learning: A case study. *Journal for research in mathematics education*, 362-385.

Flores, S. M., & Horn, C. L. (2009). College persistence among undocumented students at a selective public university: A quantitative case study analysis. *Journal of College Student Retention: Research, Theory & Practice*, 11(1), 57-76.

- Fong, K., & Visher, M. G. (2013). Fast Forward: A Case Study of Two Community College Programs Designed to Accelerate Students through Developmental Math. *MDRC*.
- Franklin, T., & Peng, L. W. (2008). Mobile math: Math educators and students engage in mobile learning. *Journal of computing in higher education*, 20(2), 69-80.
- Fraivillig, J. L., Murphy, L. A., & Fuson, K. C. (1999). Advancing children's mathematical thinking in everyday mathematics classrooms. *Journal for research in mathematics education*, 148-170.
- Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching*, 42(5), 62-66.
- Hoyles, C. (1992). Mathematics teaching and mathematics teachers: A meta-case study. *For the learning of mathematics*, 12(3), 32-44.
- Huggins, K. S., Scheurich, J. J., & Morgan, J. R. (2011). Professional learning communities as a leadership strategy to drive math success in an urban high school serving diverse, low-income students: A case study. *Journal of Education for Students Placed at Risk*, 16(2), 67-88.
- Lampert, M. (1990). When the problem is not the question and the solution is not the answer: Mathematical knowing and teaching. *American educational research journal*, 27(1), 29-63.
- Lipka, J., Hogan, M. P., Webster, J. P., Yanez, E., Adams, B., Clark, S., & Lacy, D. (2005). Math in a cultural context: Two case studies of a successful culturally based math project. *Anthropology & Education Quarterly*, 36(4), 367-385.
- Maher, C. A., & Martino, A. M. (1996). The development of the idea of mathematical proof: A 5-year case study. *Journal for Research in Mathematics Education*, 194-214.
- O'Connor, M. C. (2002). "Can any fraction be turned into a decimal?" A case study of a mathematical group discussion. In *Learning Discourse* (pp. 143-185). Springer, Dordrecht.
- Moschkovich, J. N. (2004). Appropriating mathematical practices: A case study of learning to use and explore functions through interaction with a tutor. *Educational Studies in mathematics*, 55(1-3), 49-80.
- Niess, M. L. (2005). Preparing teachers to teach science and mathematics with technology: Developing a technology pedagogical content knowledge. *Teaching and teacher education*, 21(5), 509-523.
- Puchner, L. D., & Taylor, A. R. (2006). Lesson study, collaboration and teacher efficacy: Stories from two school-based math lesson study groups. *Teaching and teacher education*, 22(7), 922-934.
- Recker, M. M., Dorward, J., & Nelson, L. M. (2004). Discovery and use of online learning resources: Case study findings. *Journal of Educational Technology & Society*, 7(2).
- Thompson, A. G. (1984). The relationship of teachers' conceptions of mathematics and mathematics teaching to instructional practice. *Educational studies in mathematics*, 15(2), 105-127.
- Thompson, L. R., & Lewis, B. F. (2005). Shooting for the stars: A case study of the mathematics achievement and career attainment of an African American male high school student. *The High School Journal*, 88(4), 6-18.
- Weber, K. (2004). Traditional instruction in advanced mathematics courses: A case study of one professor's lectures and proofs in an introductory real analysis course. *The Journal of Mathematical Behavior*, 23(2), 115-133.
- Wood, T., Cobb, P., & Yackel, E. (1991). Change in teaching mathematics: A case study. *American Educational Research Journal*, 28(3), 587-616.

Course Grades:

Weekly Readings Responses	40%
Discussion Facilitation	10%
Discussion participation	20%
<u>Critique of a Case Study</u>	<u>30%</u>
Total	100%

A	≥ 90%
B	80% - 89%
C	70% - 79%
D	60% - 69%
F	70% - 79%

Course Assignments:

1. Weekly Reading Response. Each week, you will be assigned readings from the textbook and from a menu of mathematics education research articles. For each reading, you will submit a response to the reading on Blackboard. Many of the reading responses will follow the “3-2-1 Response” format. The 3-2-1 Response consists of 1) three key ideas that emerged as most salient/significant to you from the reading; 2) two ideas/topics from the reading that you would like to explore or discuss further; and 3) one element/issue/concept that is emerging as a “problem of practice” or challenge in your understanding or application of case study research methods.
2. Discussion facilitation (two students in collaboration): For each cluster of readings, we will have an online discussion on Blackboard. I will facilitate the discussion for the first set of readings. Pairs of students will facilitate our learning around many of the subsequent readings. Each pair will be responsible for facilitating a discussion on Blackboard that will deepen our understanding and uncover insights from the case study work we read.
3. Discussion participation: Each student is expected to make regular contributions to the issues being addressed in Blackboard discussions through questions, critiques, illustrations, suggestions and other forms of feedback. Participation grades will be based on the quality rather than the number of comments or questions; on evidence of informed/insightful contributions to the issues being addressed.
4. Critique of a Case Study. This paper requires you to select, then critique a case study (or case studies) on a topic of interest to you. The case study may be reported in an article, a series of articles, a book, a dissertation and/or a technical report. The first step of the assignment involves submitting a copy of the case along with a one-page statement regarding why this case warrants a careful review. This step is due March 23. The second step of the assignment involves identifying the criteria used to appraise the case study research; the third step involves applying those criteria in an essay review of the work. In step two, draw on course readings (or other independent readings) to set up the “lens” you will use to evaluate this work. In step three, systematically apply this lens to the case study of interest, then develop a critical analysis and appraisal of the case study research. Be sure to provide reasons for your judgements and be explicit about the evidence that supports your analysis of the work. Due May 4, your critique (steps two and three) should be completed in 5-10 pages, double spaced, 12 point font.

As the instructor for this course, I reserve the right to adjust this course plan in any way that serves the educational needs of the students enrolled in this course. – Theresa A. Jorgensen

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session.

The last day to drop a class is March 29.

It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Disability Accommodations: UT Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including *The Americans with Disabilities Act (ADA)*, *The Americans with Disabilities Amendments Act (ADAAA)*, and *Section 504 of the Rehabilitation Act*. All instructors at UT Arlington are required by law to provide “reasonable accommodations” to students with disabilities, so as not to discriminate on the basis of disability. Students are responsible for providing the instructor with official notification in the form of **a letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting:

The Office for Students with Disabilities, (OSD) www.uta.edu/disability or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

Counseling and Psychological Services, (CAPS) www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

Non-Discrimination Policy: *The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.*

Title IX Policy: The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. *For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Jean Hood, Vice President and Title IX Coordinator at (817) 272-7091 or jmhood@uta.edu.*

Academic Integrity: Students enrolled all UT Arlington courses are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington’s tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code in their courses by having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University. Additional information is available at <https://www.uta.edu/conduct/>.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Campus Carry: Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>

Student Feedback Survey: At the end of each term, students enrolled in face-to-face and online classes categorized as "lecture," "seminar," or "laboratory" are directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback via the SFS database is aggregated with that of other students enrolled in the course. Students' anonymity will be protected to the extent that the law allows. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: for semester-long courses, a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

The English Writing Center (411LIBR): The Writing Center Offers free tutoring in 20-, 40-, or 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Our hours are 9 am to 8 pm Mon.-Thurs., 9 am-3 pm Fri. and Noon-6 pm Sat. and Sun. Register and make appointments online at <http://uta.mywconline.com>. Classroom Visits, workshops, and specialized services for graduate students are also available. Please see www.uta.edu/owl for detailed information on all our programs and services.

Emergency Phone Numbers:

In case of an on-campus emergency, call the UT Arlington Police Department at

817-272-3003 (non-campus phone)

2-3003 (campus phone)

You may also dial 911.

Non-emergency number 817-272-3381
