



**College of Education and Psychology
School of Education
Ed.D. in School Improvement**

**EDRM 6352.062
Quantitative Research Methods in the Education Setting
Fall 2024**

Instructor: Christopher L. Thomas, Ph.D.

Office: BEP 204

Office Hours: Wednesday 4:00 – 7:00 pm (& by appointment)

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Course Description (as listed in the catalog):

This course focuses on the field of quantitative research and statistics. It focuses on the stages of quantitative research including the development of educational research questions, research designs, conceptual frameworks, methodological stances, data collection and analysis, statistics, instrument design, and implementation in education settings. The course will focus on the interpretation and use of quantitative data with emphasis on the implications for school improvement, educational policy, and research design.

Prerequisite: HRD 6351 or equivalent graduate statistics course at another institution.

Last day to Withdraw from the course: November 4th, 2024

Student Learning Outcomes

After completion of this course, students will be able to:

1. Read and critically evaluate educational research.
2. Identify and describe different types of quantitative research methodology.
3. Discuss the influence of research data on pedagogy and accountability practices.
4. Formulate clearly stated, important research questions
5. Design and conduct research studies with the potential to improve teaching and learning experiences, counseling and support services, school leadership, and educational organizations and structures.

Program Goals

- a. Produce the next generation of educational leaders who understand the philosophical and historical perspectives of school reform, diversity, and learning opportunities for all, and can address educational issues using a variety of strategies.



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- b. Develop critical reasoning and a deep understanding of change theory to address challenges in school improvement contexts. This will include the skills to provide transformative leadership to schools that are failing to meet academic, social, and emotional standards.
- c. Provide opportunities to develop doctoral students' ability to approach challenges in innovative data-driven ways, including the use of interdisciplinary teams, as well as expand their problem solving, creative design, communication, and collaboration skills.
- d. Challenge the norms within educational systems using data and the engagement of other educators and stakeholders in professional learning to lead disruptive change through interdisciplinary work with experts in other educational fields.
- e. Conduct research of practice and responsiveness to improve teaching and learning experiences, counseling and support services, school leadership, educational organizations and structures, and all other educational disciplines.
- f. Prepare the next generation of educators with the knowledge, skills and tools to utilize data to guide school improvement and policy and to improve learning outcomes leading to college and career readiness.
- g. Prepare educators with a deep understanding of assessment and accountability systems.
- h. Produce scholar practitioners that have a P-20 perspective of the education system to address school improvement in the broader perspective including educator preparation, teaching and learning.

Required Resources

Textbooks

Strunk, K. K., & Mwavita, M. (2022). *Design and analysis in educational research using jamovi: ANOVA design*. Routledge.

Free through UT Tyler Library.

Heiman, G. W. (2014). *Basic statistics for the behavioral sciences (7th edition)*. Cengage Learning.

Select readings from this text will be provided by the instructor.

Software:

JAMOVI (v. 2.3.XX Solid) - Available for free at <https://www.jamovi.org/download.html>

Additional Readings (to be distributed by instructor):

Coughlan, M., Cronin, P., & Ryan, F. (2007). Step-by-step guide to critiquing research. Part 1: quantitative research. *British journal of nursing*, 16(11), 658-663.



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Galloway, A. (2005). Non-probability sampling. In K. Kempf-Leonard (Ed) *Encyclopedia of Social Measurement* (pp 859 – 864). Elsevier

Harlacher, J. (2016). An Educator's Guide to Questionnaire Development. REL 2016-108. *Regional Educational Laboratory Central*.

Kraft, M. A. (2020). Interpreting effect sizes of education interventions. *Educational Researcher*, 49(4), 241-253

Labaree, D. F. (2003). The peculiar problems of preparing educational researchers. *Educational researcher*, 32(4), 13-22.

Taylor-Powell, E., & Marshall, M. G. (1998). *Questionnaire Design: Asking questions with a purpose*. Cooperative extension service, university of wisconsin-extension

Thompson, B (1994). The concept of statistical significance testing. *Practical Assessment, Research & Evaluation*, 4(5). Available online:
<http://PAREonline.net/getvn.asp?v=4&n=5>.

Vance, D. E., Talley, M., Azuero, A., Pearce, P. F., & Christian, B. J. (2013). Conducting an article critique for a quantitative research study: perspectives for doctoral students and other novice readers. *Nursing: Research and Reviews*, 3, 67-75.

Supplemental Readings:

Blom-Hoffman, J., Leff, S. S., Franko, D. L., Weinstein, E., Beakley, K., & Power, T. J. (2009). Consent procedures and participation rates in school-based intervention and prevention research: using a multi-component, partnership-based approach to recruit participants. *School mental health*, 1(1), 3-15.

Campbell, D. T., & Stanley, J. C. (1963). *Experimental and quasi-experimental designs for research*. Rand McNally & Company.

Gibbons, B., & Herman, J. (1996). True and Quasi Experimental Designs. *Practical Assessment, Research & Evaluation*, 4
Available at: <https://scholarworks.umass.edu/pare/vol5/iss1/14>

Götz, F., Gosling, S., & Rentfrow, J. (2021). Small effects: The indispensable foundation for a cumulative psychological science.

Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Frontiers in psychology*, 4, 863.

NSF Program Evaluation Handbook



Pope, P., Boleman, C., & Cummings, S. (2005). Questionnaire design: Asking questions with a purpose. Texas A&M University System.

de Winter, J.C.F. (2013). Using the Student's t-test with extremely small sample sizes. *Practical Assessment, Research, and Evaluation*, 18,
Available at: <https://scholarworks.umass.edu/pare/vol18/iss1/10>

Course Policies and Expectations:

Use of Artificial Intelligence: Most assignments in this course will permit using artificial intelligence (AI) tools, such as ChatGPT or Copilot. When AI use is permissible, it will be documented in the assignment description, and all use of AI must be appropriately acknowledged and cited. When using AI tools for assignments, add an appendix showing (a) the entire exchange (e.g., prompts used), highlighting the most relevant sections; (b) a description of precisely which AI tools were used, (c) an explanation of how the AI tools were used (e.g. to generate ideas, elements of text, etc.); and (d) an account of why AI tools were used (e.g. to save time, to surmount writer's block, to stimulate thinking, to experiment for fun, etc.). Using AI tools without appropriate acknowledgment and citation violates UT Tyler's Honor Code, constitutes plagiarism, and will be treated as such.

Course Environment: This is an online course that is delivered through the Canvas Learning Management System. As such, it is imperative that you check Canvas for necessary information and course materials. If you experience technical problems or have a technical question about this course, you can obtain assistance by emailing itsupport@patriots.uttyler.edu. When you email IT Support, be sure to include a complete description of your question or problem including: (1) the title and number of the course, (2) the page in question, (3) If you get an error message, a description and message number, and (4) what you were doing at the time you got the error message.

Written Assignments: All written assignments should be typed (double-spaced, Times New Roman, 12-point font) and submitted by midnight Central Standard Time on the due date. All written assignments should be submitted through the assignment link that I will provide. Please name written assignments using the following convention: last name, first initial, assignment title (ex. Last_F_Assignmenttitle). Assignments completed for other courses may **NOT** be turned in for this course and will be considered **academic dishonesty**.

Email: Questions and concerns about course content and assignments should be submitted to my email. I will make every effort to respond quickly to your emails. Generally speaking, I check email twice a day during the workweek and less frequently on the weekend. If my schedule makes me unavailable to answer emails for an extended period, I will try to post an announcement so that you can plan accordingly. My priority is communicating with you and providing you with the tools needed to be successful in the course, so if there are any problems, we will work to solve them.



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Late Work Policy: Late work refers to any course assignment that is submitted after the stated deadline. **Late work will be accepted in this class. However, there will be a 10% penalty for each late day.** Practically, this means that you will not receive credit for an assignment if you submit it after 10 or more days. Importantly, the late work policy does not apply to discussion board posts. Discussion board posts and replies will not be accepted after the stated deadline.

Student Assignments & Projects:

The course is designed to be delivered in a "module format." This means that there will be a few different modules that you will work through that include their own readings and assignments. The modules will be presented in a standardized format. The following are standard activities that will be included in the modules:

Readings: This course requires a considerable degree of independent reading to ensure that you develop content mastery. There will be two main reading requirements throughout the semester. Specifically, you will be required to read selections from the course textbooks and research articles that I will assign. All research articles will be available on the Canvas site. I will also be posting supplemental readings for some of the topics that we will cover this semester. These readings are optional and are provided for those who would like to explore the course topics in more detail.

Lecture Videos: Each week, I will post short lecture videos to the Canvas site to support the development of content mastery. The topic of each lecture video(s) will be related to key concepts found within the readings for that week. The lecture video(s) for each topic will be available on the Canvas site each Monday morning beginning at 9:00 am Central Standard Time. Please expect that the lectures in this course will be similar in length to those seen in a traditional face-to-face course.

Data Analysis Assignments: Students will be expected to conduct and interpret the results of basic statistical procedures conducted using the JAMOVI software.

Final Project: You will work to design and test a hypothesis using one of the provided real data sets posted on Canvas. The final product will be a paper consisting of introduction, method, results, and discussion sections. Additional information about the final project will be provided later in the semester.



Article Critique: It is important that all educational researchers can critically evaluate the quality of published research. As such, students will be expected to complete **one written critique** of published educational research articles. The focus of this critique will be on the questions that the researcher(s) hoped to answer using statistical methods discussed in the course, the approach selected, and the suitability (or lack thereof) of their application of this method to the question(s) at hand, and the appropriateness of the author's interpretation of the statistical results. More information about the article critique assignment will be posted later in the semester.

Self-Reflections: Research shows that metacognition (the ability to reflect on study success and make changes) is critical for success in doctoral programs. As such, I will be asking you to complete several low-stakes reflections designed to increase your metacognitive ability. I will provide information about these assignments later in the semester.

Discussion Boards: You will participate in **1 discussion board** this semester. The discussion board will allow us the opportunity to do introductions and discuss questions/concerns about the course.

Research Pool Requirement: Students in select course must fulfill a research pool requirement. The research pool requirement must be completed before the final week of the academic semester. The research requirement for these courses can be satisfied in one of two ways. First, students can fulfill the research pool requirement by volunteering to participate in approved research studies offered by the School of Education. Alternatively, students can satisfy the research pool requirement by completing alternative assignments that are equal in time and effort to the research opportunities. Detailed information about the research requirement can be found on the CANVAS page for the course.

Due Date: Unless stated otherwise, all assignments are due before Midnight on Sunday of the week they appear on the course schedule. Stated another way, each week's assignments are due before Midnight on Sunday.

Grade Item	% Of final grade	Total Points
Discussion Board Post	1 %	1 Discussion Boards X 10 points per Discussion = 10 points
Data Analysis Assignments	72%	9 Assignments x 80 points per assignment = 720 points
Article Critique	10%	100 points



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Final Project	10%	100 points
Self-Reflection Assignments	2%	2 reflections x 10 points per reflection
Research Requirement	5%	50 points
Course Total		1000 points

Please note: The number, content focus, and point value of all assessments and assignments are an approximation and may change. Letter Grades: Letter grades will be assigned using the following guidelines:
A: 90.00% of points or above, B: 80.00% -89.999% of points, C: 70.00% - 79.999% of points, D: 60.00% -69.999% of points, F: 59.999% of points or below.



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Proposed Semester Schedule

Date	Topic(s)	Required Reading(s)	Supplemental Readings (Optional)	Discussion Board Post	Assignments
Week 1					
Aug. 26 th – Sept 1 st	Introduction to Quantitative Educational Research	Strunk & Mwavita – Ch. 1 Labaree (2003)	Blom-Hoffman et al, 2009 Ethics resources (Common Rule, FERPA, human subjects research, etc.)	Introductions & Syllabus Reconnaissance	
Week 2					
Sept 2 nd – Sept. 8 th	Research Design, Sampling, levels of measurement	Strunk & Mwavita – Ch. 2 Galloway (2005)	Campbell & Stanley (1963) Gibbons & Herman (1996)		
Week 3					



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Sept. 9 th – Sept. 15 th	Measures of Central Tendency and Variability	Strunk & Mwavita – Ch. 3			
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Proposed Semester Schedule

Date	Topic(s)	Required Reading(s)	Supplemental Readings (Optional)	Discussion Board Post	Assignments
Week 4					
Sept. 16 th – Sept. 22 nd	Introduction to NHST	Strunk & Mwavita – Ch. 4 Thompson, 2004			Data Analysis Assignment #1: Descriptive Statistics Self-Reflection #1
Week 5					
Sept. 23 rd – Sept. 29 th	Single Sample Tests (z – test & one-sample t-test)	Strunk & Mwavita – Ch. 5	Kraft, 2020 Lakens, 2013		



Week 6

Sept. 30 th – Oct. 6 th	Comparing means from 2 independent groups	Strunk & Mwavita – Ch. 6 Strunk & Mwavita – Ch. 7	Winter, 2013		Data Analysis Assignment #2: Single Sample Tests
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Proposed Semester Schedule

Date	Topic(s)	Required Reading(s)	Supplemental Readings (Optional)	Discussion Board Post	Assignments
Week 7					
Oct. 7 th – Oct 13 th	Comparing 3 or more independent means (one-way ANOVA)	Strunk & Mwavita – Ch. 8 Strunk & Mwavita – Ch. 9			Data Analysis Assignment #3: Independent Samples T-Test
Week 8					



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Oct. 14 th – Oct 20 th	Factorial ANOVA (Part #1)	Strunk & Mwavita – Ch. 10 Strunk & Mwavita – Ch. 11			Data Analysis Assignment # 4: One Way ANOVA
Week 9					
Oct. 21 st – Oct 27 th	Factorial ANOVA (Part #2)				

Proposed Semester Schedule

Date	Topic(s)	Required Reading(s)	Supplemental Readings (Optional)	Discussion Board Post	Assignments
Week 10					
Oct. 28 th – Nov 3 rd	Paired samples analysis with 2 measurement points.	Strunk & Mwavita – Ch. 12 Strunk & Mwavita – Ch. 13			Data Analysis Assignment #5: Factorial ANOVA



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Week 11					
Nov 4 th – Nov 10 th	Paired samples analysis with 3 or more measurement points	Strunk & Mwavita – Ch. 14 Strunk & Mwavita – Ch. 15			Data Analysis Assignment #6: Paired Samples T-Test
Week 12					
Nov 11 th – Nov 17 th	ANOVA with between and within subjects' variables	Strunk & Mwavita – Ch. 16 Strunk & Mwavita – Ch. 17			Data Analysis Assignment #7: Repeated Measures ANOVA

Proposed Semester Schedule

Date	Topic(s)	Required Reading(s)	Supplemental Readings (Optional)	Discussion Board Post	Assignments
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Week 13

Nov 18 th – Nov 24 th	Introduction to Measures of Association and Correlation Analysis	Heiman – Chapter 7			Data Analysis Assignment #8: Split-Plot ANOVA
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Week 14: Thanksgiving!

Nov 25 th – Dec 1 st					
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Week 15

Dec 2 nd – Dec 8 th	Survey design, Reliability, and Validity	Harlacher, J. (2016) Taylor-Powell (1998)	Patrick & Berry, 1991 Pope et al., 2005		Data Analysis Assignment #9: Correlation Research Requirement
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Finals Week

Dec 9 th – Dec 14 th					Final Project Self-Reflection #2
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