

TED 6320

Quantitative Research Methods I

Fall 2023

Course Instructor

Dr. Liru Hu

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Office Hours: Monday 8:30-9:10 pm (after each session) or Friday 10:00-11:30am (by appointment)

Course Information

TED 6320

Quantitative Research Methods I

3 Credit Hours

Fall semester (Mondays 5:30-8:20pm) **Education Building 405**

Required

Course Description and Purpose

The course is designed for research postgraduate students who need an introduction to quantitative methods in education. It will start with a conceptual introduction to the common issues and the fundamentals of quantitative research in education (including common research topics and questions addressed by quantitative research methods, key steps in designing a quantitative study, and reliability & validity, sampling and hypothesis testing issues). The course will cover a range of inferential statistics and students will learn about these topics in the context of a variety of published research studies. Through the course, students are expected to develop the knowledge and skills needed to read and evaluate published research using quantitative methods. Students are also expected to be able to perform basic data analysis using standard statistical packages (e.g., SPSS) and to interpret the analysis results appropriately.

Course Requirements

Format. This course will be conducted in a hybrid format. Additional online arrangement will be conducted in special cases and will be notified in advance.

Attendance. Your attendance and active participation are vital for your final score. To achieve full participation points, you can only miss one session (with instructor approval) and one online discussion activity at most. Missing 2 consecutive weeks or failing to communicate will result in automatic course withdrawal. Please inform the instructor of any planned absence beforehand. Consistent attendance demonstrates commitment and professionalism, playing a pivotal role in your successful course completion. If you anticipate missing more than three classes, consider taking the course at a different time. Additionally, if you're unable to meet all requirements, it's your responsibility to adhere to the university's course drop deadlines.

Workload Policy. A 3-credit class is required to have 45 contact hours. Additionally, you may expect to have approximately 1-3 hours of homework for every class session for class readings and the preparation of materials. Assignments in some chapters in the textbook may be easily finished within couple hours; however, the material in the later chapters does increase in difficulty and the time burden in tackling some of the assigned exercises increases accordingly. Please, make appropriate adjustments!

Due Date. Timely completion of all coursework is essential for this class to run smoothly. The credit of late submissions will be deducted by 50% and by 100% after the solutions are released or the end of the course. Students have a single opportunity to waive the late submission penalty, but this is reserved for emergent cases. Approval from the instructor must be sought before the due date. Please ensure that you carefully read all instructions for each assignment, particularly the due dates and times.

Course Preparation. Students must be ready for every class. This entails: 1) Reading assigned chapters and materials and 2) Finishing any assigned class or homework tasks, if applicable.

Key References

American Psychological Association. (2020). *Publication manual of the American Psychological Association (7th ed.)*. Washington, DC. <https://apastyle.apa.org/products/publication-manual-7th-edition>

Field, A. (2018). *Discovering Statistics using SPSS, (5nd Ed.)* London: SAGE Publications.

Huck, S. W. (2012). *Reading statistics and research (6th ed.)*. Boston: Pearson. <http://readingstats.com>

Johnson, B., & Christensen, L. (2020). *Educational Research: Quantitative, qualitative, and mixed approaches (7th ed.)*. Thousand Oaks: Sage.

Patten, L. M., & Newhart, M. (2018). *Understanding research methods: An overview of the essentials (10th ed.)*. Routledge.

Student Learning Outcomes

By the end of this course, students should become knowledgeable about the concepts of commonly used quantitative approaches in educational research; develop the ability to critically evaluate published quantitative research studies in one’s field; and develop skills in conducting statistical data analysis and interpreting analysis results.

Table 1. Student learning outcomes and assessment

Student Learning Outcomes		Assessments
	By the end of course, the student will be able to:	To evaluate these outcomes, the faculty member will use the following assessment procedures:
1.	Students will learn methods of descriptive statistics, specifically learn what the difference between qualitative and quantitative research is, what variables are and how one can compute measures of central tendency (mean, median and mode) and variability (standard deviation and variance).	a. Chapter quizzes, b. Participation in oral/online discussion of statistical techniques, c. Individual report for course project
2.	Understand, interpret, and critically evaluate statistical methods in published articles.	a. Group presentation performance, b. Participation in oral/online discussion of statistical techniques, c. Individual report for course project
3.	Perform data analyses and interpretation of results.	a. Chapter quizzes, b. Participation in oral/online discussion of

	statistical techniques
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Course Evaluation and Grading

1. Chapter quizzes (30%). The student will be able to build a working knowledge of statistical concepts through the assessment of chapter content. The format of the test will include multiple choice questions and short computational problems. These exams will be via **Blackboard Learning System** emphasizing concepts and computational applications. You will have two attempts and the highest score will be kept.

2. In-class and online participation (20%). Students need to attend each session on time, finish the required reading before class, and actively participate in in-class and online discussions. They are expected to share relevant resources, pose questions, and help each other. To receive a full participation score, every student has only one chance to be absent from class with approval from the instructor and one chance to miss an online discussion, with completion of a late make-up.

3. Group presentation (20%). The students will be grouped in 2 to 3 and will be responsible for sharing how a chosen article uses a specific statistical method. They need to choose and annotate an appropriate journal article using a specified quantitative method. They should share the selected article with the class one week before their session and present their findings in class for around 25 minutes followed by a 15-minute whole-class discussion.

Guiding questions for group presentation

What are the research questions and designs?

How does the study use a specified quantitative method?

Are there flaws in the analyses?

If yes, what are they?

How can we correct these flaws?

If no, what can we learn from their analyses?

Are the interpretations/discussions of the results inappropriate?

If yes, why are they inappropriate?

How could we improve it?

If no, what can we learn from their interpretations?

4. Individual course project (30%). Each student will annotate a published quantitative research article, preferably in their own research field. Annotation should be 1,000 - 2,000 words. Each student selects an empirical journal article that employs quantitative methods from the course syllabus. Annotation includes summary of research question and study design, critique of analysis methods, result interpretation, findings, and other possible issues. Submit work on assigned due date in APA7 format.

Guiding questions for writing the annotation

What are the research questions?

What are the research designs?

Are there flaws in the analyses?

If yes, what are they?

How would you correct these flaws?

If no, what do you learn from their analyses?

Are the interpretations/discussions of the results inappropriate?

If yes, why are they inappropriate?

What would you have written instead?

If no, what do you learn from their interpretations?

Table 2. General scoring criteria for assignments

Aspects	Score levels					Aspects
	5	4	3	2	1	
CONTENT						CONTENT
Excellent, outstanding performance						Unsatisfactory performance
Question/Task very clearly understood						Question/Task misunderstood
Full coverage of topic						Key aspects of topic neglected
All basic and higher order goals met						Goals not met (basic or higher order)
Very high level of skills						Basic skills not demonstrated
LOGIC & COHERENCE						LOGIC & COHERENCE
Concepts very clearly understood						Concepts not understood
Argument always logical						Illogical argument
Highly logical structure & development						Assignment rambles & lacks structure
LANGUAGE						LANGUAGE
Meaning very clear						Meaning often unclear
Fluent, accurate grammar and vocabulary						Unacceptable grammar & vocabulary use
FORMAT						FORMAT
Very high standard of presentation						Poor presentation
COMMENTS:						

Final grade. A standard scale will be used in order to determine final grades. The scale is as follows: 90% or above – A, 80% to 89.9% - B, 70% to 79.9% - C, 60% to 69.9% - D, below 60% - F.

Grade	Earned Points
A	90-100
B	80-89
C	70-79
D	60-69
F	Below 60

Course Instructional Methods

The instructional methods pertinent to the efficient delivery of the material will focus on the following didactical processes and procedures:

1. Introduction and exposition of new material via instructor-led presentation using chapter syntheses of significant chapter content through MS Powerpoint presentations.
2. Instructor-led illustration of chapter material using educational and data-driven problems from textbook exercises or other relevant sources.
3. Student-led sharing of articles using specific statistical techniques with opportunities to collaborate in groups.
4. Student-led question and answer sessions.

5. Instructor-led summary and discussion of presented chapter material or evaluation of material taught.

Class Policies / Statements

Civility in the Classroom. Maintain a focused classroom for effective learning. Unless approved by the instructor, refrain from cellphone use, eating, offensive remarks, internet browsing, reading unrelated materials, sleeping, or other distractions. Inappropriate behavior, including offensive comments related to gender, ethnicity, etc., will not be tolerated and could result in being asked to leave. Show courtesy to classmates and instructors.

Discussion. Maintain a respectful and academically productive discourse in both our in-class and online learning environment. Our course fosters safe, respectful social learning. Embrace diverse ideas while upholding respect for others. Participate fully and openly, considering these guidelines:

- Keep discussions confidential, creating a judgment-free zone.
- Share within your comfort level, considering the lasting nature of electronic records.
- Use proper language, avoid shortcuts, and adhere to academic writing standards in online discussion.
- Address ideas, not individuals; avoid harassment or inappropriate content.
- Refrain from just simplistic answers or redundant responses;
- Engage each member in the discussion;
- Contribute thoughtfully, considering following discussion strategies: express one's idea clearly with examples or illustrations; explain or elaborate one's ideas; reference readings and classmates; invite others to explain or elaborate their ideas; build on others' ideas; challenge others with evidence like counter-examples; evaluate each other with reasons or suggestions; encourage others by acknowledging their significance, progress or good points; summarize discussions; reflect on individual or group performance.

American with Disability Act. The university is committed to the principle that in no aspect of its programs shall there be differences in the treatment of persons because of race, creed, national origin, age, sex, or disability, and that equal opportunity and access to facilities shall be available to all. If you require special accommodations in order to participate; please contact me, as soon as possible for necessary accommodations. The student should present appropriate verification from **UTEP Center for Accommodations and Support Service (CASS)**. No requirement exists that accommodation be made prior to completion of this approved university process.

Honor Code. For those courses where student is assigned to generate reports, literature reviews, and research projects, I take our standards of professional ethics seriously, as I expect all members of the academic community to do. Any form of cheating or plagiarism will result in student being referred to the Office of Student Life. Student will be informing of the action taken by the instructor with instructions to be followed by the student.

Standards of Academic Integrity. Uphold academic integrity by avoiding cheating, plagiarism, or any unfair advantage. Scholastic dishonesty includes unauthorized collaboration, submitting others' work, or trying to gain unfair benefits. Plagiarized assignments receive a 0 grade with a 20% deduction. Properly cite borrowed ideas or text. Violations, detailed in the Handbook of Operating Procedures, may lead to disciplinary measures such as probation, failing grades, suspension, or dismissal. All coursework must be original; coursework reflects your thoughts, not rule circumvention. Instances of academic misconduct lead to referral to the Dean of Students Office and potential suspension or expulsion from UTEP.

Technical Assistance. For technical problems with our online course site or related computer/Internet applications, please contact the UTEP Helpdesk: M - F: 7AM - 8PM, Sat: 9AM - 1PM, Sundays 11- 4 PM. On campus phone: 915.747.5257. Off campus: 915.747.4357. If you are on campus, you may also visit the

ATLAS lab located within the Undergraduate Learning Center (UGLC building) or the Technology Support Center in Room 300, Library.

UTEP Support Services

UTEP Library. Access a wide range of resources including online full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students. This is the resource we will be using extensively in this class.

Help Desk. Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.

University Writing Center (UWC). The University Writing Center (UWC): Virtually everyone needs help with writing academic English. There is no shame in it. The UWC [Library Building, Rm. 227: (915) 747-5112] provides online consultations to all UTEP students at no cost. They also have walk-in services, if you are local. It is a terrific resource! If I suggest you attend the Writing Center, it is because I think you will benefit from it. Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.

Final Word

- 1) I reserve the right to change procedures, readings and topics as necessary, with ample warning.
- 2) Incomplete work doesn't automatically lead to an "Incomplete" grade. An "I" grade might be considered for unforeseen life events, but it's better to avoid this situation. The grading system shifts if requirements aren't completed. Arrange to finish course material for your final grade.
- 3) My aim is to help you thrive in this course. If any special circumstances impact your participation (e.g., language, religion, family, neurological differences, immigration), inform me for tailored solutions. I'll provide support. Consider UTEP Center for Accommodations and Support Services as a resource.
- 4) Seek help when needed. If you're struggling to grasp expectations, course material, or assignments, take initiative. Reach out early via email or office hours. Don't wait until last minute or end of semester. I'm here to assist you in ensuring your success in the class.

Calendar

The calendar is a *guide* and *may be changed* as needed to meet the needs of students. Changes will be communicated via Blackboard Announcements and in class. Stay attentive to your email and Blackboard for vital updates. Assignment and reading specifics are in weekly coursework modules.

Table 3 Tentative Class Activity Schedule - Fall 2023

Session	Format	Topic	Date
1	Online	Course introduction	8/28/23
2		(Labor Day Holiday)	9/4/23
3	F2F	Introduction to quantitative research in education	9/11/23
4	Online	Variables in quantitative research	9/18/23
5		(20th Class Day)	9/25/23
6	F2F	Fundamental concepts in inferential statistics	10/2/23
7	Online	t-test I	10/9/23
8	F2F	t-test II (group presentation)	10/16/23

9	Online	ANOVA I	10/23/23
10	F2F	ANOVA II (group presentation)	10/30/23
11	Online	Correlation I	11/6/23
12	F2F	Correlation II (group presentation)	11/13/23
13	Online	Regression I (invited speaker)	11/20/23
14	Online	Regression II	11/27/23
15	F2F	Regression III (two group presentations)	12/4/23
