Quantitative Research Methods

Course Description

The course is designed to provide the student with the knowledge and skills needed to read, analyze and synthesize educational research, and to give the student experience in the development and conduct of a research project. Course content includes instruction in preparation of a research proposal, identification of a research problem, sampling techniques, research design, instrumentation, data collection, and data analysis.

Prerequisites: EDLD 6333, EDLD 6392, EDLD 6384

Rationale

Doctoral students must be knowledgeable and competent in the methodology of educational research in order to complete a doctoral dissertation. This course will provide the student with the opportunity to gain both theoretical and practical knowledge needed to conduct an educational research study. It will also provide the student with the opportunity to review and synthesize professional literature in areas of interest.

Course Objectives/Learning Outcomes

After successful completion of the course, the student should be able to demonstrate knowledge and understanding of:

1. The basic skills required to comprehend and analyze educational research studies in a variety of educational settings.
2. The different types of research design and their appropriate usage.
3. The statistical techniques which are appropriate to use in different research designs.
4. The basic research skills needed to plan and conduct a research study.
5. Ethical standards and considerations in conducting research in an educational setting.
6. The methodology for writing a literature review for a research topic.

State Adopted Proficiencies for Teachers and/or Administrators/Counselors - NA

TExES Competencies - NA
Textbooks


Course Packet (derived from various sources)

Recommended Reading


Frey, B.B. (2015). *100 questions (and answers) about tests and measurement*. LA, CA: SAGE


Salkind, N.J. (2012). *100 questions (and answers) about research methods*. LA, CA: SAGE


Course Topics

Unit 1 - The Scientific Research Process
- Styles of Research
- The Scientific Methods of Problem Solving
- Research Strategies and Variables
- Research Quality
- MaxMinCon Principle
  *Meltzoff, chapters 1-3, 5, 9; Vogt, chapters 1 & 17; Course Packet, Unit 1*

Unit 2 – An Overview of Research Designs
- Experimental Research
- Ex Post Facto Research
- Other Types of Research
- Confounding/Extraneous Variables
- Factorial Designs, Repeated Measures Designs
- Questionnaire Survey
- The Interview as a Research Tool
  *Meltzoff, chapter 6; Vogt, chapters 3, 5, 6, 9, & 15; Course Packet, Unit 2*

Unit 3 - Instrumentation
- Validity (face, content, criterion-related, construct)
- Reliability (test-retest, equivalent forms, internal consistency, Spearman-Brown Prophecy Formula, KR 20 & KR 21 Formulas, procedures to compute Cronbach’s Coefficient Alpha)
- Scaling (Likert, Thurstone, Semantic Differential)
- Commonly Used Tests in Educational Research
- Data Collection Methods
  *Meltzoff, chapter 7; Vogt, chapter 7; Course Packet, Unit 3*

Unit 4 - Exploratory Factor Analysis
- Factor Extraction and Rotation
- Factor Analysis vs. Component Analysis
- Sample Size Estimation
  *Vogt, chapter 13; Course Packet, Unit 4*

Unit 5 - Item Analysis
- Item Difficulty, Item Discrimination, Distractor Analysis
  *Vogt, chapter 16, Course Packet, Unit 5*

Unit 6 - Sampling
- Target vs. Accessible Population
- Probability vs. Non-probability Sampling
- Sample Size Estimation, Using SPSS
  *Vogt, chapter 5; Course Packet, Unit 6*

Unit 7 - An Overview of Data Collection and Data Analysis
- Descriptive Statistics vs. Inferential Statistics
- Univariate vs. Multivariate Statistics
- Parametric vs. Non-Parametric Statistics
  *Meltzoff, chapter 8; Vogt, chapters 2, 4, 8, & 11; Course Packet, Unit 7*
Instructional Methods and Activities

- Lecture/discussion
- Practice problems
- Homework assignments
- Data analysis exercises
- Developing the dissertation proposal

Evaluation and Grade Assignment

Test 1 (units 1-2) 20%
Test 2 (units 3-5) 20%
Test 3 (units 6-7) 20%
Homework Assignments 20%
Dissertation Topic Paper 20%

The Collaborative Institutional Training Initiative (CITI) is the program utilized by TAMU-CC to ensure training is received by all faculty members, staff, and students engaged in human subject research. Go to [http://research.tamucc.edu/compliance/irb_citi.html](http://research.tamucc.edu/compliance/irb_citi.html) and complete the Social and Behavioral Responsible Conduct of Research course. **Provide the instructor with a copy of the completion certificate.**

Due: ______________

Grading Scale:

- 90 – 100 A
- 80 - 89 B
- 70 - 79 C
- 60 - 69 D
- < 60 F

Incomplete, I. “An incomplete notation may be given to a student who is passing but has not completed a term paper, examination, or other required work for reasons beyond the student’s control other than lack of time.”

Course Schedule and Policies

1. Course schedule follows the course topics.
2. Late assignments are not accepted except in extenuating circumstances at the discretion of the instructor. Students who find that they are unable to be at an examination session because of illness or extenuating circumstances should contact the instructor as soon as the condition becomes apparent to arrange fair and practical extensions.
3. The instructor expects complete honesty in the completion of test and assignments. Plagiarism, “the act of taking the work/writings of another person and passing them off as one's own,” is not tolerated.
4. Cell phones must be off. Text messaging is not allowed. No food consumption.
Grade Appeals

As stated in University Rule 13.02.99.C2.01, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disability Accommodations

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall, Room 116. If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

Academic Integrity/Plagiarism

University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in failing the course.

Dropping a Class

I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. This term, _____________ is the last day to drop a class and an automatic grade of “W” will be assigned to the student.
Classroom/Professional Behavior

Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, and the like.

Statement of Civility (can be in place of classroom/professional behavior)

Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state, and federal government. We expect that you will behave in a manner that is dignified, respectful, and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

Statement of Academic Continuity

In the event of an unforeseen adverse event, such as a major hurricane and classes cannot be held on the campus of Texas A&M University–Corpus Christi, this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.
Dissertation Topic Paper

The primary purpose of this learning activity is to begin developing your doctoral dissertation proposal. Specifically, you are asked to identify the problem and formulate the research questions. In other words, you are expected to produce a “rough” draft of chapter 1 of the dissertation proposal. In EDLD 6397 – Dissertation Research, you will write the first draft of the three-chapter (introduction, review of literature, method) dissertation proposal. A typical chapter 1 consists of the following:

1. Title of the study
2. Background and Setting
3. Statement of the Problem
4. Theoretical Framework
5. Purpose of the Study
6. Research questions
7. Operational Definitions (the measurement of major variables)
8. Glossary of terms
9. Delimitations and Limitations
10. Assumptions
11. Significance of the Study
12. References

The dissertation topic paper, at the least, must include items #1 to 6, 11, and 12.

Format: Typed, double-spaced, (APA style)

Due: _____________________