Quantitative Research Methods

I. 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.

Prerequisite: EDLD 6333, EDLD 6392, EDLD 6384

II. 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.

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

IV. TExES Competencies - NA

V. 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.
VI. 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
VII. Instructional Methods and Activities

1. Lecture/discussion
2. Practice problems
3. Homework assignments
4. Data analysis exercises
5. Work on developing dissertation proposal

VIII. Evaluation and Grade Assignment

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<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Test 1</td>
<td>25%</td>
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<tr>
<td>Test 2</td>
<td>25%</td>
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<tr>
<td>Homework Assignments</td>
<td>20%</td>
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<tr>
<td>Dissertation Topic Paper</td>
<td>25%</td>
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<tr>
<td>Protection of Human Participants Tutorial Course</td>
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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%20Instructions.pdf](http://research.tamucc.edu/compliance/irb/CITI%20Instructions.pdf) and complete the *Social and Behavioral Responsible Conduct of Research* course. **Provide the instructor with a copy of the completion report.**

**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.”

IX. Course Schedule and Policies

1. Course schedule follows the course topics (see VI).
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.
X. Textbooks


XI. Bibliography, Online Sources


http://www.nottingham.ac.uk/education/MARS/papers/styles.pdf

http://elite.tamu.edu/

http://www.learnerassociates.net/dissthes/
XII. Grade Appeals

As stated in University Rule 13.02.99.C2, 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.

XIII. Disability Accommodations

If you have disability-related needs and/or are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the office of Disability Services (361-825-5816) and then inform the instructor. Every attempt is made in the course to conform to the University’s policies on disabilities.

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, methodology) 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 (how major variables are measured?)
8. Glossary of terms
9. Delimitation 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: _____________________