

Carthage College
Education 5250
Quantitative Methods in Educational Research
Monday & Wednesday 5-- 8PM
June 13, 2016—August 5, 2016

Instructor: Dr. Allen Klingenberg

Email akling2003@yahoo.com or aklingenberg@carthage.edu

Telephone – 262-308-4502 cell

Office hours: 12--1 PM Monday and Wednesday or by individual student arrangement

Office-Straz 176

Texts: Practical Statistics for Educators, 4th edition, Ruth Ravid, Rowman & Littlefield Publishers, INC. 2011. and Study Guide for Practical Statistics for Educators by Ruth Ravid and Elizabeth Oyer, 4th Edition, 2011, Rowman & Littlefield Publishers.

APA Style Manual is also recommended.

Course Description:

In this course, you will acquire skills that will enable you to conduct research in your own classrooms

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and extend your ability to critique research studies using quantitative data. The course includes a discussion of the empirical-quantitative paradigm and its advantages and limitations. The course focuses on the use of quantitative methods that may be used by educators conducting research and reflecting on educational practices. Topics related to assessment, such as norms, reliability, and validity, will also be introduced. You will plan and carry out a small-scale research study on your own area of interest using descriptive and inferential statistics.

In writing the research project report, you should use APA style (*APA Publication Manual*, 6th ed. [2010]).

We will use Excel and we will use the Data Analysis Package or you can do your computations with the help of a calculator. *I will help each individual with the data analysis phase of their project.* The course exam is an open-book exam. On the class session before the exam is due, I will review with you the content and format of the exam. ***I expect your “word of honor” that you will complete the exam on your own, without help from your classmates!*** On all other projects and assignments (e.g., research projects and article critique) collaboration is encouraged and appreciated!

I will give you a **sample research paper** which is likely to help you plan and conduct your research project, as well as write the final report.

April 19

Correlations

8 & handouts

Course Requirements and Grading:

1. Group or Individual research project (50%) (40% for the written report; 10% for the class presentation)
2. Open-book exams (30%)
3. Participation in class discussion about the **four** research article critiques (20%)
4. Attendance is required.

5. **Grading:** 90%-100% = A; 80%-89% = B; 70%-79% = C

NOTE: ALL WRITTEN ASSIGNMENTS MUST BE TYPED AND WRITTEN IN THIRD PERSON!

| <u>Date</u> | | <u>Textbook/Workbook Chapter #</u> |
|---------------------|---|------------------------------------|
| June 13 | Introduction to the course An overview of research designs and paradigms and basic concepts in statistics Analyzing research project data (Straz 251 in New Blg.) | 1, 15, & handouts |
| June 15 | Planning and conducting educational research studies and basic concepts in statistics | 2 & handouts |
| June 20 | Planning the research project Research questions & hypotheses Basic concepts in statistics Organizing and graphing data Article 1 critique due | 3 & handouts |
| | 2 | |
| June 22 | Measures of central tendency and using Excel Data Analysis Package | 4 & handouts |
| June 27 | Measures of variability and presenting Your research questions and hypotheses | 5 & handouts |
| June 29 | The normal curve; standard scores Article 2 critique due | 6 & handouts |
| July 4 | Interpreting Test Scores ** OUTLINE OF Your RESEARCH PROPOSAL DUE (1/2-1 1/2 pages) ** | 7 & handouts |
| July 6 | Student t ration "t test" Paired difference t test Article 3 critique due | 10 & handouts |
| July 11 April 19 | Analysis of Variance Correlations | 11 & handouts 8 & handouts |
| July 13 | Chi-square test | 12 & handouts |

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| July 18 | Correlations and Draft of Chapters one and two due | 8 & handouts |
| July 20 | Prediction and Regression and draft of Chapter three Due | 9 & handouts |
| July 25 | Reliability | handouts |
| July 27 | Validity | handouts |
| Aug 1 | Analyzing Research Findings, Using APA Format Style and Reviewing for Take Home Final. | |
| Aug 3 | Final Paper Due along with Take Home Final Final Presentations | |

HAVE A GREAT SUMMER BREAK

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Individual Research Project

An individual project is required. This involves writing the research questions and hypotheses; planning the study; collecting, analyzing, and interpreting the data; writing the final report; and presenting the project in class. ***Please be sure to check your topic with me before you go ahead with the project.*** The topic of the research project should be chosen by you (and I suggest a mini thesis) and it can be the same topic you investigated in the previous research course (– the qualitative research course) as long as it involves data which can be analyzed. Additional directions and information about conducting the research project can be found in Chapter 15 of the book *Practical Statistics for Educators* (Ravid, 2000). Please check out sample Theses that are available in the library.

A. An outline of the proposed study, including the research questions and hypotheses; a tentative methodology (1/2-1 1/2 page; **double space using future tense**): Indicate the research questions you intend to explore and any predictions (i.e., hypotheses) about the results you expect to find after you collect and analyze your data. The rationale for the study can also be included in this assignment. **(Due: July.)**

B. The written report (7-12 pages, double space, using APA style): **(DUE: on the last session of class which is Aug. 5.)** The written report has several parts: Introduction, Literature Review, Methodology, Results, Discussion, and References. ***Remember to use past tense in writing the research report (as opposed to the Research Proposal which is written in future tense)!*** Additional (and more detailed) information about how to write the research report is found in Chapter 15 of the textbook. The written report should include the following:

(1) **Introduction** (1-2 pages): This is an expansion of the first part of your proposal. It should

introduce your study, and describe the rationale for the study, as well as research questions and hypotheses.

- (2) **Literature Review** (2-5 pages): In the review, you should cite at least 3 sources per team member. The review should synthesize and summarize research related to your topic. The review should be logically organized by subtopics, and the sources used should be clearly listed (e.g., names of authors, dates of publications, and page numbers of quotes). You may want to consider using subheadings when typing your literature review.
- (3) **Methodology** (1-3 pages): This part is an expanded version of the Methodology part of the proposal. The first part in Methodology is **Sample** (or **Participants**), where you should clearly describe the sample used (e.g., how they were selected, demographic characteristics). This is followed by **Instrument(s)** where you described the tests, surveys, or other instruments used to collect your data. **Procedure**, the next section, describes how data was collected. You may also add a section called **Data Analysis**, describing how you coded your data and the statistical tests used to analyze the data.
- (4) **Results**: Here you should report on the study's findings and include tables and charts (1-2 pages). (Please be sure to type the tables and figures using APA style!)
- (5) **Discussion, Conclusions, and Implications** (1-3 pages). Here you interpret the findings from

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your study, relating them back to your hypotheses and research questions, and comparing your findings to those reported by other researchers. Your conclusions should also be included in this part.

- (6) **References** (a minimum of 5 references): List the sources you cited in your report using APA style.

☺ A sample paper will be emailed or provided to all students. There are also sample Theses in the library.

C. Class report: You will have up to 10 minutes (depending on the number of individuals in our class) to present your project to the class. In your presentation, briefly discuss the methods you used and focus your discussion on the results and interpretations (**DUE: On the last session August 5**).

D. Please note: Carthage College seeks to ensure that its programs are accessible to all persons. Students in need of special assistance or an accommodation regarding any of the course requirements as outlined in the syllabus and discussed in class are advised to notify me immediately. We will meet privately to discuss a resolution of your issue, which may or may not include an appropriate referral (e.g., a Writing Specialist, the ADA Accommodations Coordinator). Confidentiality will be maintained regarding your special needs.

If you would like me to mail your final research paper back to you after I finish reading it, please attach to your paper a self-addressed, stamped envelope when you submit your paper to me on the last day.

Article Critiques

This is a whole-class discussion assignment. I will distribute in class one or two articles to be critiqued and the others will be found by you for your group/individual research project. These articles must contain numerical data and would allow you to enhance your skills in critiquing published research. You do need to submit a one-two page paper for this assignment for each article and you may want to follow the points listed below for your analysis.

- a. **Title**: Is it clear? Does it summarize the main idea of the article? If not, can you suggest a better title?
- b. **Abstract**: Is there an abstract? Does it summarize the article accurately?
- c. **Literature Review**: Is the review adequate? Does it provide the necessary background? Are important findings noted? Is it well organized? Does it introduce the problem?
- d. **The Problem Statement** (may be a part of the Literature Review): Is it clear? Does it relate to the literature review? Does it state the purpose and rationale? Are there any hypotheses stated?
- e. **Method** (this section should provide sufficient information for the reader who may want to replicate the study):

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Participants (or: Sample): Is there a clear and detailed description of the participants and how they were selected? Are important characteristics of the sample reported?

Instruments: Are they clearly described? Is there enough information about the measures used to collect the data? Is there information about the reliability and validity of the instruments?

Procedure: Is it clearly and adequately described? Can a reader understand how the study was conducted?

Design (or: Data Analysis): Is there an explanation of the design and data analysis?

- f. **Results**: Are main findings reported? Are they well organized? Are they clearly presented? Are there tables, graphs, or charts that help present the findings?
 - g. **Discussion**: Are the results examined and evaluated? Are there conclusions regarding the original hypotheses? Are there explanations of the results? Are the conclusions justified based on the results? Are there implications for the practitioners? Are there suggestions for further research?
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EDUCATION 5250 Course Objectives

1. Examine alternative ways of knowing via various research paradigms.
2. Understand how practitioner research is situated within the empirical/quantitative paradigm.
3. Be able to gather information on a topic of interest using multiple data sources, including the Internet, and evaluate the credibility of these sources.
4. Be able to analyze and critique educational research and construct a review of that research.
5. Understand the differences among, and assumptions underlying, experimental, correlation and descriptive research.

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6. Understand the processes of statistical testing and hypothesis testing.
7. Know the difference between descriptive and inferential statistics and the procedures used to select samples.
8. Be able to compute introductory-level statistics.
9. Understand measurement concepts, such as norms, reliability, and validity.
10. Know how to select, apply and interpret the appropriate statistical procedures covered in the course, in order to answer research questions.
11. Be able to use Windows-based computer software to analyze statistical data.
12. Be able to design and carry out a research study that includes a problem statement/research question, a limited literature review, the methodology used in the study, the findings and conclusions based on the data.

April 19 Correlations

8 & handouts

13. Share reflections on different aspects of the research process and the research study findings with the other students in the class through in-class discussions as well as electronic dialogue (e.g., Web forums, listservs, online chat, or email distribution lists).
14. Be able to relate the findings of the student's own research study to educational practice.
15. Be able to examine one's own practice, using skills acquired in the course.