Quantitative Data Analysis
DPLS 722-Spring 2015
Saturday 8am-12pm Tilford 405

Instructor: David Sloan, PhD          Email: Dsloan@Whitworth.edu
Dates: 1/17, 1/24, 2/7, 2/21, 3/7, 3/21, 3/28, 4/18

Course Description:
Quantitative data analyses require the use of statistics (descriptive and inferential) to summarize data collected, to make comparisons of data sets, and to generalize results obtained from samples back to the populations from which the sample were drawn. Knowledge about statistics and statistical analysis can help a researcher interpret data for the purpose of providing meaningful insights about the problem being investigated. Prerequisite: DPLS 720. 3 credits

Course Objectives:
• Understand and apply appropriate post-positivist\(^1\) and mixed methods research methodologies.
• Relate, understand, and apply post-positivist methodology to research questions relevant to leadership studies.
• Demonstrate a solid understanding of basic statistics through reading, talking, and writing about core statistical concepts.
• Formulate research questions and corresponding statistical hypotheses that can enhance understanding of a given phenomenon.
• Create and present meaningful leadership related quantitative research ideas to peers through poster presentations.
• Create or use existing databases to seek answers to research questions or to test hypotheses.
• Select appropriate statistical techniques (methods) for a given question or hypothesis statement.
• Apply statistical procedures to test hypotheses using appropriate statistical application(s).
• Correctly interpret statistical application output.
• Communicate findings verbally, visually, and in written format.
Course Texts:


Other Readings
To be Announced

Course Requirements:

**Two Poster Presentations** (40%): Design, test, and write up a mock study using data to complete a quantitative research project. See Blackboard > Assignments > Poster Projects.

**Participation** (10%): Participants will be expected to attend all sessions. If you miss a meeting please inform me via email prior to the missed meeting. Missing more than two meetings will result in an incomplete and require either taking the course again or auditing it at some future time. You will also be expected to collaborate and problem solve with your work group over problem sets and difficult conceptual material.

**Problem Sets** (30%): These assignments must be completed autonomously but can be reviewed and revised in the in-class workgroups. See Blackboard > Assignments > Problem Sets. **You must also post your completed Dretzke file for each class meeting to Blackboard under your name in the following format:** LastNameCourseMeeting#1, LastNameCourseMeeting#2, etc.

**Reading Assignments and Videos** (10%): In this course we will use text based sources and multiple web-based video tutorials – with suggested readings outlined in the course plan below. It is expected that all students will complete all the reading and tutorial assignments prior to each class meeting. **Please post all LFD exercises to Blackboard on or before the class meeting indicated. I will be spot checking the assignments but not be “correcting” them. You will have time to “correct” your own worksheets with colleagues during your workgroup sessions.**

**Article Presentations** (10%): Students will present topics journal articles that apply statistical methods discussed in class. Additional details will be discussed in class.
**Grading:**

The grading emphasizes your individual learning achievement in this course.

- Complete all assignments correctly, participate in class actively: = A
- Complete all assignments, participate in class passively: = A-
- Complete all assignments, minimal class participation: = B

**Course Schedule & Assignments:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Subject</th>
<th>Readings and problems due before class</th>
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| 1st Meeting| Why Statistics?  
Descriptive Statistics | Dretzke Ch. 1-3  
Complete using Excel and post to Blackboard  
Learning from Data (LFD) Ch. 1 & 2  
Chapter 1 - Questions: 3, 5, & 7  
Chapter 2 - Questions: 1, 2, 4, 5 & 6  
Watch:  
http://www.youtube.com/watch?v=DhV-TlQ3nw  
http://www.youtube.com/watch?v=9683wjPNsXk |
| 1/17       |                                  |                                                                                                         |
| 2nd Meeting| Frequency Distributions  
Central Tendency  
Variability     | Dretzke Ch. 4 & 5  
Complete using Excel and post to Blackboard  
LFD Ch. 3 & 4  
Chapter 3 - Questions: 1, 2, 3, & 11  
Chapter 4 - Questions: 1, 2, 8, 9, & 10  
Watch:  
https://www.khanacademy.org/math/probability/descriptive-statistics/central_tendency/v/statistics-intro--mean--median-and-mode (box & whisker plots optional but useful to be familiar with)  
<p>| 1/24       |                                  |                                                                                                         |</p>
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Date</th>
<th>Topics</th>
<th>Assignments</th>
<th>Recommended Resources</th>
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| 3<sup>rd</sup> Meeting | 2/7 | - Probability Distributions  
- Inferential Statistics  
- Same Samples t-tests | Dretzke Ch. 6 & 7  
- Complete using Excel and post to Blackboard  
LFD Ch. 5, & 6  
- Chapter 5 - Questions: 1 & 5  
- Chapter 6 - Questions: 1, 2, & 4  
- Chapter 7 - Questions: 1, 2, & 3 | Watch:  
https://www.khanacademy.org/math/probability/random-variables-topic/random_variables_prob_dist/v/random-variables  
| 4<sup>th</sup> Meeting | 2/21 | - Hypothesis Testing  
- Sampling Distributions  
- Independent Samples t-tests | Dretzke Ch. 8  
- Complete using Excel and post to Blackboard  
LFD Ch. 7 & 8  
- Chapter 7 - Questions: 1, 2, 3, 4, 5, 6, 7, 8, & 9  
- Chapter 8 - Questions: 1, 3, 11 & 12 | Watch:  
https://www.khanacademy.org/math/probability/statistics-inferential/normal_distribution/v/introduction-to-the-normal-distribution (review this video on Z scores)  
https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/hypothesis-testing-and-p-values  
http://www.youtube.com/watch?v=k80pME7mWRM |
| 5<sup>th</sup> Meeting | 3/7 | - Power  
- Parameters  
- ANOVA | Dretzke Ch. 9  
- Complete using Excel and post to Blackboard  
LFD Ch. 9 & 10  
- Chapter 9 - Questions: 1, 2, 3, 4, 5, & 6  
- Chapter 10 - Questions: 1, 2, 3, & 4 | Watch:  
http://www.youtube.com/watch?v=vtMkGAFrJ9E  
http://www.youtube.com/watch?v=HNjvVbs1Jak  
http://www.youtube.com/watch?v=S5or2pQcfEQ  
https://www.khanacademy.org/math/probability/statistics-inferential/confidence-intervals/v/confidence-interval-1 |
<table>
<thead>
<tr>
<th>Meeting</th>
<th>Topic</th>
<th>Reading</th>
<th>Notes</th>
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| 6th     | Hypothesis Testing     | Dretzke Ch. 10<br>
- Complete using Excel and post to Blackboard  | LFD Ch. 11-15<br>
- Chapter 11 - Questions: 1 & 2<br>
- Chapter 12 - Questions: 1, 4, 5, & 7<br>
- Chapter 13 - Questions: 1, 2, 3, & 5<br>
- Chapter 14 - Questions: 1 & 5<br>
- Chapter 15 - Questions: 1, 3, 4  | Watch: <br>
[https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/hypothesis-testing-and-p-values](https://www.khanacademy.org/math/probability/statistics-inferential/hypothesis-testing/v/hypothesis-testing-and-p-values)  |
|         | Correlation            |              |                                                                      |
|         | Regression             |              |                                                                      |
| 7th     | Research Symposium     | Dretzke Ch. 9<br>
- Complete using Excel and post to Blackboard  | LFD Ch. 16-19<br>
- Chapter 16 - Questions: 3 & 4<br>
- Chapter 17 - Questions: 1, 2, 3, & 4<br>
- Chapter 18 - Questions: 1 & 2<br>
- Chapter 19 - Questions: 1  | Watch: <br>
|         |                        |              |                                                                      |
| 8th     | Linear Relationships   | Dretzke Ch. 10-12<br>
- Complete using Excel and post to Blackboard  | LFD Ch. 20-22<br>
- Chapter 20 - Questions: 1, 11, & 12<br>
- Chapter 21 - Questions: 1, 2, 3, & 15<br>
- Chapter 22 - Questions: 1, 5, & 7  | Watch: <br>
[http://www.youtube.com/watch?v=4EXNedimDMs](http://www.youtube.com/watch?v=4EXNedimDMs)  |
|         |                        |              |                                                                      |
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