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Syllabus

InsT 7200 Quantitive Methods

Justification

Why do instructional technology students need a course in Quantitive Methods in addition to those offered by the College of Education? There are two answers to this question. First, formulating research questions in the context of instructional design and development poses some unique challenges for our students. Most of instructional technology focuses on developing products. Is it possible to also do experimental research in the context of delivering instruction? How does one formulate questions for this context? How does one design research studies that can be conducted as instruction in being delivered? What are some of the unique variables that have been studied in instructional psychology? What additional variables need to be studied? All of these questions are unique to the field of instructional technology and deserve a separate course where these questions can be addressed.

Second, our students need to be introduced to the basic ideas of experimental research and statistical analysis so that they can make informed decisions about whether to complete their additional methodology requirements in the fundamental subjects or in some other methodology. This course is designed to present just enough about basic research design to help them make this decision in an informed way. This aspect of the course does overlap with the existing courses to some minor degree. However, it is not intended that it replace any of what is taught in the college of education methods courses but rather to facilitate our students decision to take these courses.

Approach

The fundamental objective of this course is to teach you how to ask questions about instructional variables that lend themselves to an empirical research investigation. Much of instructional technology involves design and development. It is sometimes difficult to see how to conduct experimental research in the context of these design and development efforts. The goal of this course is to help you look at instructional design and development in such a way that you can identify variables and can be isolated and submitted to experimental research, often in the context of delivering instruction.

Instructional situations involve many confounding variables. A major emphasis of this course will be to help you find and eliminate these confounding variables in the research studies you design and conduct in the context of instruction.

You will also obtain a very brief overview of experimental research design and statistical analysis. The emphasis in this course is primarily on asking meaningful research questions in the context of instructional design and delivery. Detailed instruction in statistical analysis techniques or research design will not be featured in this course. Hopefully, this course will demonstrate to you the need for skill in statistical analysis and research design and inspire you to make these analysis tools your methodology of choice for your PhD.

On-line components

Much of the work of this course will be conducted on-line at groups.yahoo.com. You will need to subscribe to the class group site. Send an email message as instructed below to subscribe. You can then post messages as per the first direction below. The group site has a calendar that you can consult. You can post files to the group site or post links to other URLs. All assignments should be posted either to this site or posted to your personal web site with a link indicated on the group site. All on-line discussion will be conducted via the group site. Feedback on you work, my primary responsibility, will be posted as

messages to the group site. All messages will be sent to you by email. Reminders from the calendar will also be sent to you via email.

Some of the files posted to the group site will be in PDF format. If you don't have Adobe Reader you can download a free copy from www.Adobe.com.

Schedule

Date	Lecture/Discussion	Assignment Due	Reading Assignment Due
9/5/01	Lecture: Research Review and Critique		5 Studies Campbell & Stanley, ETS (2)
9/12/01		Post research reviews Respond to reviews	
9/19/01	Discussion: Review Lecture: Extending Research		
9/26/01		Post research extensions Respond to extensions	
10/3/01	Discussion: extension Lecture: Research Treatments & measures		Merrill (1), ETS (1),
10/17/01		Post research treatments and measures Respond to treatments and measures	
10/24/01	Discussion: Treatments & measures Lecture: Experimental Design and data analysis		
10/31/01	Lecture: Research report		
11/21/01		Post data analysis and research report Respond to analysis and report	
11/28/01	Discussion: Analysis and report		
12/12/01		Post essay on Instructional Research	Reasearch reviews

Assignments

1. Five Studies. Find five experimental studies that investigate variables related to instructional design or development. Obtain copies of these papers. Do not include case studies. Do not include theory papers. Do not include studies that include only qualitative data. Do not include research reviews.

Prepare a one page written review for each of the five studies.

Write a one page critique for each of the five studies.

- Post your reviews and critiques to the group site as per the schedule.
- Respond on-line to the review and critique of at least two other students.
2. Prepare a design for a research extension for two of the studies. Describe any new treatments in detail. Describe any new measurements in detail.
- Post your extensions to the group site as per the schedule.
- Respond on-line to the extension of at least two other students.

You will be required to design, conduct, analyze the data, and write a research report for an experimental study. You may work together with one other student on this project if you wish. Keep this study simple. You should have only two groups. Each group should have at least 10 subjects but they needn't be larger than 15. You should be able to analyze the data using simple statistics that do not require a computer program.

3. Prepare treatments for your experimental study. Post your treatments to the web as per the schedule. Critique the treatments for two other students.
4. Prepare measures for your experimental study. Post your measures to the web as per the schedule. Critique the measures for two other students.
5. Administer your treatments and measures to a group of students. Summarize and analyze the data. Post your analysis to the web as per the schedule. Critique the analysis for two other students.
6. Write a research report in final form ready for publication in an appropriate journal. Obtain and follow the publication guidelines for the selected journal. You may want to submit your report for publication (if you are an A student). Post your report to the web as per the schedule. Critique the report of two other students.
7. Read several research reviews that review experimental research related to instructional design or development. One key word is "instructional psychology". There are probably others. You may want to start this reading assignment early in the semester.

Write an essay for designers-by-assignment (non-professionals) based your reading. This might be a list of suggested practices derived from the research. Prepare your essay for publication. You might want to submit your essay for publication (if you are an A student). Post your essay to the group site as per the schedule. Critique the essay for at least one other student.

Reading Assignments

Merrill (1). Merrill, M. D. (1994). Chapter 3 Teachers should not waste time writing behavioral objectives. In M. D. Merrill *Instructional Design Theory*. Educational Technology Publications, 33-46.

ETS (1) ETS (1963). *Multiple Choice Questions: A Close Look*. Educational Testing Service.

ETS (2) Diederich, Paul B. (1960). Short-cut Statistics for Teacher-made Tests. Evaluation and Advisory Service Series No. 5. Educational Testing Service.

Campbell, Donald T. and Stanley, Julian C. (1963). *Experimental and Quasi-Experimental Designs for Research*. Houghton Mifflin. You can obtain from Amazon or Barnes Nobel.

Annual Review of Psychology. Issues on Instructional Psychology over the past 30 years. List of those reviews will be posted to the group site.