

Ph.D. in Educational Statistics and Research Methods 2016-2017

The University of Arkansas Ph.D. degree program in educational statistics and research methods (ESRM) prepares graduates for conducting theoretical and applied research in the fields of quantitative statistical methods, psychometrics, educational psychology, and education-related fields. Graduates are prepared for employment in higher education; local, state, and national educational agencies; research and policy organizations; and industries with internal data needs. The primary learning goals of the ESRM PhD program are centered around the identification of statistical procedures, analyses of data, communicating findings, critiquing research studies, and collaborating effectively with others.

An assessment of the effectiveness of the program would include students' ability to:

1. Identify appropriate research designs for research questions,
2. Conducting statistical analyses for research hypotheses,
3. Understand the strengths, weaknesses, and appropriateness of different statistical procedures,
4. Critique statistical analyses completed by others,
5. Conduct simulation studies to evaluate statistical procedures under varying conditions,
6. Submit research proposals or manuscripts to professional conferences and journals,
7. Complete oral research presentations,
8. Use effective pedagogical processes to explain statistical design and processes to others.

In order to assess the effectiveness of our student training this year, we aggregated student data from research projects, candidacy exams, dissertation proposals, professional conference presentations, journal articles, grant submissions, academic or professional awards, and job placements.

Assessment Information

Course-Based Data:

The quality of course-based research projects and components of take-home exams provided data for the learning outcomes of identifying appropriate designs, conducting statistical analyses, and identifying strengths, weaknesses, and appropriateness of statistical procedures. Student projects and take-home examinations have been averaged (i.e., their final grades) for core coursework in *Objective 1 – Core Statistical Design Courses*: educational statistics, experimental design, multiple regression, multivariate analysis; *Objective 2 – Measurement and Psychometrics*: measurement and Item Response Theory (IRT); and *Objective 3 – Advanced Statistical Design*: Hierarchical Linear Modeling (HLM), Structural Equations Modeling (SEM), advanced multivariate analysis. The course-based performances were graded a 4 if they earned a mastery level of 90% or higher on their project/assignment/exam, 3 for 80-89%, 2 for 70-79%, 1 for 60-69%, and a 0 for less than 60%. There are ten ESRM doctoral students who took at least one

core course during the 2016-2017 academic year and the overall average score was 3.970 with 33 records.

Identifying Research Designs, Conducting Statistical Analyses, Evaluation Procedures

Learning Objectives 1, 2, and 3	Average	Minimum	Maximum
Core Statistical Design Courses	4.00	4.00	4.00
Measurement and Psychometrics	3.90	3.00	4.00
Advanced Statistical Designs	4.00	4.00	4.00

Seven doctoral students took or retook candidacy exams during 2016-2017 academic year. Three successfully completed on their first try. One passed 3 of 4 sections. She will retake her fourth section in fall 2018. Another three retook sections of the exams and passed.

Active Research:

One student successfully passed her dissertation proposal defense in 2016-2017. Five students are actively working on their dissertation proposal topics.

The doctoral students were active in research activities, and seven students attended national conferences in this academic year. A list of their research presentations, articles, grants, and submissions are provided:

Student Research Proposals, Manuscripts, and Grants

Learning Objectives 6 and 7	Submitted (not including those accepted)	Accepted
Research Presentations	4	7
Journal Articles	2	1
Grants	-	1

Awards:

One of our current students has been awarded a Walton Distinguished Doctoral Fellowship (DDF). Three of our current students have been awarded graduate student travel grants for national conferences.

Training Others and Collaborating with Professionals in Other Fields:

Doctoral students gain experience in using pedagogical methods to explain statistical processes to others through course instruction and tutoring in the statistics laboratory. First, four of our current students have been teaching undergraduate sections of ESRM 2403 Statistics in Nursing in 2016-2017 (6 sections), and tutoring students for masters and doctoral level courses in the statistics lab. Second, one of our doctoral students has been hired by the Nursing department to assist and conduct research analyses and interpret results for faculty. In addition, many of our students who are not departmental G.A.'s assigned to a class have been tutoring students in our applied statistics courses. Our students have also been active in collaborating on research

projects with students and colleagues in other fields within our university (and internationally). This is a valuable practice within our field.

Changes Planned Based on Assessment Findings

Student performance in classes and on skills-based evaluations have been appropriate. The largest area of concern is getting all students active in national presentations and article submissions. Our faculty members are going to work toward facilitating greater participation in summer research studies in preparation for conference proposals to national groups such as the American Educational Research Association (AERA), National Council of Measurement in Education (NCME), American Psychological Association (APA) and Modern Modeling Methods (M3).