Ph.D. in Educational Statistics and Research Methods 2017-2018

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 twelve ESRM doctoral students who took at least one

core course during the 2017-2018 academic year and the overall average score was 3.864 with 22 records.

Identifying Research Designs, Conducting Statistical Analyses, Evaluation Procedures

Learning Objectives 1, 2, and 3	Average	Minimum	Maximum
Core Statistical Design Courses	3.50	3.00	4.00
Measurement and Psychometrics	4.00	4.00	4.00
Advanced Statistical Designs	3.86	3.00	4.00

Three doctoral students took or retook candidacy exams during 2017-2018 academic year. One successfully completed all four sections of the written exams on the first try. Two passed 3 of 4 written sections and the first try, and successfully completed their fourth section upon a retake. All three students passed the oral examination component.

Active Research, Internships, and Awards:

One student successfully defended her dissertation in 2017-2018 and one student successfully passed her dissertation proposal defense. Five students were actively working on their dissertation proposal topics.

Doctoral students were active in research activities, with four students attending five national conferences in this academic year with two students attending two conferences (e.g., American Educational Association, National Council on Measurement in Education, NCME Inaugural Assessment Conference, Modern Modeling Methods, Association for Psychological Science). ESRM students were on 5 publications accepted this year. A listing of their research presentations, articles, grants, internships, and submissions are provided:

Student Research Proposals, Manuscripts, Grants, and Internships

Learning Objectives 6 and 7	Submitted (not including those accepted)	Accepted
Research Presentations	5	7
Journal Articles	-	5
Grants	-	-
Internships	8 *(technically one of these was awarded also, but the student chose the College Board internship)*	1
Fellowships	-	1*

** awarded during the 2017-2018 academic year*

One of our current students has a Walton Distinguished Doctoral Fellowship (DDF), and one new incoming student has been awarded a Doctoral Academy Fellowship (DAF). The DDF student was also awarded an NSF Fellowship grant last year and conducted her work this year in

Japan (during the 2017 summer). Five of our students were 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. Four of our graduate students teach undergraduate sections of ESRM 2403 Statistics in Nursing, and tutor students for masters and doctoral level courses in the statistics lab. One doctoral student works for the Nursing department to assist and conduct research analyses, interpret, and write results for faculty. One graduate student worked on an externally funded grant in 2017-2018 with a second student obtaining a new grant position beginning in summer 2018. One graduate student is teaching adjunct courses for our program while also working with faculty in engineering on grant activity. Our students have 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. There are significant faculty and programmatic changes in progress for our program. We are in the process of hiring a new faculty member and an instructor to replace retiring faculty. We have obtained funding for four new grants in which one has funding for multiple graduate students over the next six years. Our faculty have begun teaming with faculty from Community Health Promotions, Exercise Science, and Kinesiology in conducting weekly seminars/meetings with students to conduct and present on collaborative research. We plan to facilitate 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).