Ph.D. in Educational Statistics and Research Methods 2018-2019

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, internships, 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, 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 were 20 students in the ESRM Ph.D. program at varying stages of progress in 2018-2019. There were eleven ESRM doctoral students who took at least

one core course during the 2018-2019 academic year and the overall average score was 3.79 with 24 records (see Table 1).

Table 1.
Identifying Research Designs, Conducting Statistical Analyses, Evaluation Procedures

Learning Objectives 1, 2, and 3	Average	Minimum	Maximum
Core Statistical Design Courses	3.67	3.00	4.00
Measurement and Psychometrics	3.67	3.00	4.00
Advanced Statistical Designs	3.91	3.00	4.00

Two students successfully passed the dissertation proposal defense stage in 2018, one student successfully defended her dissertation (currently a biostatistics analyst for the University of Hawaii's Burns School of Medicine), and one is planning to defend summer 2019. Five students were actively working on their dissertation proposal topics.

Active Research, Internships, Workshops, and Awards:

Doctoral students were active in research activities, with seven students participating on 11 presentations at regional, national, and or international conferences. Four students attended our field's primary national conferences in this academic year (i.e., American Educational Research Association, National Council on Measurement in Education). One student also attended the International Meeting of the Psychometric Society, another attended the Association for Psychological Science conference, three attended the Texas Universities' Educational Statistics and Psychometrics Alliance Conference, and one attended the Institute of Education Sciences / Educational Testing Service PIAAC conference.

Our students had access to a number of on-campus trainings including two SAS workshops that were provided at the UofA prior to their administration at the AERA and NCME conferences (eight Ph.D. students attended). We had two additional SAS workshops provided by SAS employees in which at least five of our students attended. One of our Ph.D. students was awarded a travel grant to complete a 3-day workshop on using international educational data conducted by the Institute of Education Sciences.

We had three students apply for internships in 2018, with one student being awarded a summer 2018 internship with College Board and a second awarded an internship with the National Board of Internal Medicine for 2019.

One of our students who is completing this year had a Walton Distinguished Doctoral Fellowship (DDF), and two new students were awarded Doctoral Academy Fellowships (DAF) in 2018-2019. Six of our students were awarded graduate student travel grants for conferences.

ESRM students were on five publications accepted/published this year. A summary of their research presentations, articles, grants, internships, and fellowships are provided in Table 2.

Table 2.
Student Research Proposals, Manuscripts, Grants, and Internships

Learning Objectives 6 and 7	Number
Research Presentations	11
Journal Articles	5
Travel Grants	6
Internships	2*
Fellowships	3**

** 1 accepted for summer 2019*
***2 awarded during the 2018-2019 academic year*

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. In addition, two of our doctoral students assisted ESRM faculty with their courses and Blackboard management.

One doctoral student works for the Nursing department to assist and conduct research analyses, interpret, and write results for faculty. Two graduate students worked on an externally funded grants in 2018-2019. Three of our graduate students served as adjunct instructors for selected courses in 2018-2019. 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. We have had significant faculty and programmatic changes in our program with three faculty leaving (two retirements, one job relocation) and two new faculty hires (one tenure-track, one clinical). Our new faculty team is in the process of program coursework realignment and the development of a more heavily research-intensive degree program. We are designing new program requirements to engage more students in research in years 1 and 2 of the program. We have four of five faculty currently working on internal and external grants, with two of these grants supporting graduate assistant lines. 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. Two of our students presented at this seminar in spring 2019. 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), International Meeting of the Psychometric Society (IMPS), American Psychological Association (APA) and Modern Modeling Methods (M3).