Indiana University
Jacobs School of Music, Music Education
Quantitative Research in Music Education – E631 30371 – Fall 2017
M, W: 2:30 to 4:00, Simon Library 373 (computer lab)

Instructor Information:
Dr. Peter Miksza
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Course Description:
      This course will provide an introduction to foundational principles and methods of quantitative research in music education. The course will begin with a discussion of the nature of scientific inquiry and its application to music education scholarship. This will be followed by units that cover general guidelines for basic descriptive, correlational, and experimental research designs. An introduction to statistical analysis tools applicable to each design category will be provided as appropriate. Students will be challenged to critique existing research, pose hypothetical designs, analyze data, and create reports with actual data sets. Students will also complete proposal sketches for two original empirical studies, preferably as pilot work that could contribute in some way to their long-term research goals (e.g., public lecture, dissertation, presentation, publication).

Required Texts
- Huck, S. W. (2013). *Reading statistics and research* (6th ed.). New York, NY: Pearson.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2007). *Educational research: An introduction.* New York, NY: Pearson.
- Nicol, A. A. M., & Pexman, P. M. (2011). *Presenting your findings: A practical guide for creating tables.* Washington, DC: American Psychological Association.
- Nicol, A. A. M., & Pexman, P. M. (2011). *Displaying your findings: A practical guide for creating figures, posters, and presentations.* Washington, DC: American Psychological Association.
- APA manual – current edition
- Additional pdf readings and websites will be posted on Canvas

(Strongly) Recommended Text for SPSS Assistance
- Morgan, G. A., Leech, N. L., Gloeckner, G. W., & Barrett, K. C. (2013). *IBM SPSS for introductory statistics* (5th ed.). New York, NY: Routledge

Recommended Foundational Statistics Text
- Agresti, A., & Finlay, B. (2008). *Statistical methods for the social sciences* (4th ed.). New York, NY: Pearson.

Objectives:
Upon completing this course students will be able to…
1. Discuss basic characteristics of scientific inquiry:
    a. Epistemological foundation
    b. Objectivity and transparency
    c. Scientific reasoning
2. Discuss major considerations for observational research designs and critique existing research incorporating such designs.
3. Discuss major considerations for survey research designs and critique existing research incorporating such designs.
4. Discuss major considerations for correlational research designs and critique existing research incorporating such designs.
5. Discuss major considerations for true-, quasi-, and within-subjects experimental designs and critique existing research incorporating such designs.
6. Apply the following statistical topics to analyses of data (using SPSS):
    a. Levels of data/Measurement scales
    b. Basic indices of central tendency and dispersion
    c. Descriptions of distributional characteristics (skewness and kurtosis)
    d. Correlation and covariance
        i. Procedures appropriate for various measurement scales (e.g., phi/Cramer's V, Spearman's rho, Pearson's r)
    e. Descriptive vs. inferential statistics
    f. Parametric vs. Non-parametric inferential analyses
    g. Inference: sampling distributions, null hypothesis significance testing, statistical significance, statistical power, and confidence intervals
        i. Independent and dependent t-tests and their non-parametric equivalents
        ii. One-way ANOVA, repeated-measures ANOVA and their non-parametric equivalents
        iii. Simple and Multiple Linear Regression
    h. Internal/external validity in experimental design vs. measurement
7. Create figures, tables, and written interpretations of findings when given data sets suited to the procedures described above
8. Apply the design concepts and analytical tools discussed in the course to their own research interests and methodological design.

The point breakdown of the course grade is as follows:

Weekly Homework	200 (10 @ 20pts each)
Proposal Project	100
TOTAL	300

Grading (in percentage):

A+	97-100	B+	87-89	C+	77-79	D+	67-69	F	Below 60
A-	93-96	B	83-86	C	73-76	D	63-66		
A-	90-92	B-	80-82	C-	70-72	D-	60-62		

Assignments – in addition to content, writing quality is an important criterion for each assignment:

1. *Homework:* Work will be assigned each week as practice for the methodological principles and analytical approaches discussed and demonstrated in class. This could include some or all of the following types of tasks: analyzing existing studies, proposing hypothetical designs, analyzing data, interpreting data, creating figures and tables.
2. *Proposal Project:* Students will complete proposal sketches for two original empirical studies: a descriptive study and an experiment. Each proposal must articulate (a) an important problem/need for research, (b) a theoretical framework, (c) an annotated bibliography of 5 related studies in lieu of a formal literature review, (d) a purpose statement and research questions/hypotheses, and (e) a methodology. Manuscripts must conform to APA style.

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IU POLICY

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Accommodations for Religious Holidays: Please note the dates recognized by IU at http://www.iub.edu/~vpfaa ("Forms"). A student accommodation request form is available at this site. Please fill one out and bring it to class should the need arise.

Academic Misconduct: The definition of academic misconduct and the procedures to be followed at IU in the case that a problem should occur can be found at http://www.iu.edu/~code/. See both the Code document itself and the IU Bloomington Procedures.

Disabilities
Students requesting accommodations for various types of disabilities are referred to the Office of Disability Services for Students (Franklin Hall 006, 855-7578). Adjustments in course requirements cannot be made until a written evaluation from this office is received. Please see: http://studentaffairs.iub.edu/dss

Date	Topic	Sub-Topics and Readings	Homework Due
Quantitative Research in Music Education – Course Schedule - Miksza		

Date	Topic	Sub-Topics and Readings	Homework Due
Scientific Foundations			
8/21	Introduction	Miksza & Elpus, *Prelude* (pdf) Morgan et al., *Chapter 1*	
8/23	Science	Miksza & Elpus, *Characteristics of science* (pdf) Shaddish, Cook, & Campbell, *Experiments as meta-science – EXCERPT* (pdf)	
8/28	Research Programs and Theoretical Frameworks	Platt, *Strong inference* (pdf) Miksza & Johnson, *Theoretical frameworks in the JRME* (pdf) Morrison, *Forum* (pdf)	
8/30	Introduction to Data Analysis	[Morgan et al., *Chapter 2*]	
9/4	LABOR DAY	NO CLASS	
Descriptive Research Design and Analysis			
9/6	Sampling	Miksza & Elpus, *Descriptive research design* (pdf) Gall, Gall, & Borg, *Chapter 6*	HW1: *Science and SPSS practice*
9/11	Descriptive Research: Observation	Miksza & Elpus, *Descriptive research design* (pdf) Gall, Gall, & Borg, *Chapter 9*	
9/13	Descriptive Research: Observation	Miksza & Elpus, *Descriptive analysis* (pdf) Huck, *Chapter 2* Goolsby, *Time use in instrumental rehearsals* (pdf) [Morgan et al., *Chapter 3*] [Morgan et al., *Chapter 5*]	
9/18	Descriptive Research: Survey	Miksza & Elpus, *Descriptive research design* (pdf) Gall, Gall, & Borg, *Chapter 8*	HW2: *Analyzing observational study data*
9/20	Descriptive Research: Survey	Miksza & Elpus, *Descriptive analysis* (pdf) Huck, *Chapter 2* Buonviri & Paney, *Melodic dictation instruction* (pdf)	

9/25	Statistical Inference	Miksza & Elpus, *Inferential analysis* (pdf)	HW3: *Analyzing survey study data*
9/27	Statistical Inference	Huck, *Chapter 7*	
10/2	Statistical Inference	Huck, *Chapter 8* [Morgan et al., *Chapter 6*]	HW4: *Statistical inference*
Correlational Research Design and Analysis			
10/4	Correlational Research	Miksza & Elpus, *Correlational design and analysis* (pdf)	
10/9	Correlational Research	Huck, *Chapter 3* Miksza, *Relationships among impulsiveness, locus of control, sex, and music practice* (pdf) [Morgan et al., *Chapter 8*]	HW5: *Analyzing correlation study data*
10/11	Correlational Research	Gall, Gall, & Borg, *Chapter 11 (p. 331 - 351, 375-378)*	
10/16	Correlation for Reliability and Validity	Huck, *Chapter 4* [Morgan et al., *Chapter7*]	HW6: *Analyzing non-parametric correlation study data*
Experimental Research Design and Analysis			
10/18	Causal Inference	Miksza & Elpus, *Causation and causal claims* (pdf)	
10/23	Experimental Research	Miksza & Elpus, *Design and analysis of experimental research I* (pdf) [Morgan et al., *Chapter 10*]	HW7: *Causal inference*
10/25	Experimental Research	Gall, Gall, & Borg, *Chapter 12* Huck, *Chapter 10*	
10/30	Experimental Research	Hutton, *A comparative study of two methods of teaching sight singing* (pdf) Gall, Gall, & Borg, *Chapter 12* Huck, *Chapter 10*	HW8: *Experimental design and analyzing data with t-tests*
11/1	Experimental Research	Gall, Gall, & Borg, *Chapter 13* Huck, *Chapter 11* [Morgan et al., *Chapter 11*]	
11/6	Experimental Research	Gall, Gall, & Borg, *Chapter 13* Huck, *Chapter 11*	HW9: *Experimental design and analyzing data with oneway*

			ANOVA and post-hocs
11/8	Experimental Research	Fisher, *Effect of ethnicity on onset of voice change* (pdf) Gall, Gall, & Borg, *Chapter 13* Huck, *Chapter 11*	
11/13	Experimental Research	Miksza & Elpus, *Design and analysis of experimental research II* (pdf) Gall, Gall, & Borg, *Chapter 13* Huck, *Chapter 14*	
11/15	Experimental Research	Johnson, *Effect of rubato magnitude on perception of musicianship* (pdf) Gall, Gall, & Borg, *Chapter 13* Huck, *Chapter 14*	
Regression Analysis			
11/27	Simple Linear Regression	Miksza & Elpus, *Regression* (pdf) [Morgan et al., *Chapter 9*]	HW10: *Experimental design and analyzing data with repeated-measures ANOVA and post-hocs*
11/29	Simple Linear Regression		
12/4	Multiple Linear Regression	Huck, *Chapter 16*	
12/6	Multiple Linear Regression		
FINAL PROJECT DUE December 12th 5:00PM			