Course Description

MEDD8907 Statistical Analyses for Advancing Educational Equity and Social Justice

Course description

This course is designed to equip students with diverse statistical tools to advance equality, equity, and social justice in education. The specific topics include the concepts of (in)equality, equity, and social justice explored in quantitative studies, categorical variables that characterise different demographic features (e.g. race and ethnicity, gender, socioeconomic status, sexual orientation, immigration status), statistical interaction terms, and fundamental statistical methods for advancing educational equity, including ANOVA (Analysis of Variance), ANCOVA (Analysis of Covariance), MANOVA (Multivariate Analysis of Variance), MANCOVA (Multivariate Analysis of Variance), and regression and logistical regression analysis using categorical variables and statistical interaction terms. This course will illustrate how to use R software to carry out most statistical analyses and graphics covered in this course. This course aims to prepare students with fundamental knowledge and skills necessary to analyse quantitative data, to interpret the results from the analyses, to effectively present results in tables and figures, and to apply appropriate strategies to reveal patterns of educational inequality and advance equity and social justice.

Course objectives

- 1. To prepare students with fundamental knowledge and skills necessary to analyze quantitative data
- 2. To interpret the results from the analyses, to effectively present results in tables and figures
- 3. To apply appropriate strategies to reveal patterns of educational inequality and advance equity and social justice.

Course learning outcomes (CLOs)		Aligned programme learning outcomes (PLOs)	
1.	Identify and pursue critical questions to advance equity and social justice in statistical analyses	PLOs 1-5	
2.	Demonstrate a fundamental understanding of basic and fundamental statistical methods to advance equity and social justice	PLOs 1-4	
3.	Conduct statistical analyses on inequality and social justice and effectively present, explain, and interpret the results for a non-technical audience	PLOs 1-5	
4.	Read, interpret, and critically evaluate statistical methodology, outcomes and interpretations found in educational studies in relation to equity and social justice	PLOs 1-5	
Course assessment methods			
•	Attendance and participation		
٠	Homework		
•	Final project		
Course content and topics			
٠	Introduction to the course and R software		
٠	 Conceptual understandings of equity and social justice in quantitative studies, Data structure 		
•	Categorial variables, and coding of data		
٠	The use of Analysis of Variance (ANOVA) and Analysis of Covariance (ANCOVA)		
•	 The use of Multivariate Analysis of Variance (MANOVA) and Multivariate Analysis of Covariance (MANCOVA) 		

• Regression analysis using categorical predictors and statistical interaction terms

Required / recommended readings and online materials

• Azar, B. (2006) Discussing your findings. http://www.apa.org/gradpsych/ 2006/01/findings.aspx

- Gillborn, D., Warmington, P., & Demack, S. (2018). QuantCrit: Education, policy, "Big Data" and principles for a critical race theory of statistics. Race Ethnicity and Education, 21(2), 158–179.
- Jang, S. T. (2018). The implications of intersectionality of race, gender, and socioeconomic status on Southeast
- Asian female students' educational outcomes: Critical quantitative intersectionality analysis. American Educational Research Journal, 55(6), 1268-1306.
- Jang, S. T. (2019). Schooling experiences and educational outcomes of Latinx secondary school students living at the intersections of multiple social constructs. Urban Education. Advance online publication. doi:10.1177/0042085919857793
- Jang, S. T. (2020). The schooling experiences and aspirations of students belonging to intersecting marginalisations based on race or ethnicity, sexuality, and socioeconomic status. Race Ethnicity and Education. Advance online publication. doi: 10/1080/13613324.2020.1842350
- Jang, S. T., Halse, C., Lee, D. H. L., & Hon, Q. C. K. (2021). Belongingness and national belonging among youth in Hong Kong. Youth & Society. Advance online publication. doi: 10.1177/0044118X211022393
- Jang, S. T., & Alexander, N. A. (2022). Black women principals in American secondary schools: Quantitative evidence of the link between their leadership and student achievement. Educational Administration Quarterly. Advance online publication. https://doi.org/10.1177/0013161X211068415
- Kutner, M., Nachtsheim, C., Neter, J., & Li, W. (2005). Applied linear statistical models. McGraw Hill/Irwin.
- Museus, S. D., & Griffin, K. A. (2011). Mapping the margins in higher education: On the promise of intersectionality frameworks in research and discourse. New Directions for Institutional Research, 2011(142), 5–13.
- Nicol, A. A., & Pexman, P. M. (2010). Displaying your findings: A practical guide for creating figures, posters, and presentations. American Psychological Association.
- Stage, F. K. (2007). Answering critical questions using quantitative data. New Directions for Institutional Research, 2007(133), 5-16.
- Tabachnick, B. G., & Fidel, L. S. (2013). Using multivariate statistics. Pearson.
- Teranishi, R. T. (2007). Race, ethnicity, and higher education policy: The use of critical quantitative research.
- New Directions for Institutional Research, 2007(133), 37–49.

Other additional course information

Nil