IS THE GRE PREDICTIVE OF STUDENT SUCCESS

IN PURDUE'S ON-CAMPUS MASTER OF ENGINEERING MANAGEMENT PROGRAM?

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OVERVIEW

Requiring the GRE exam for admission to Purdue's on-campus Master of Engineering Management program is becoming less desirable for many reasons. Research suggests the GRE may be biased in ways that hinder diversity, peer MEM programs moved to GRE optional during the pandemic, and qualified students with work experience are not always willing to invest the time and money to take the GRE. This project creates a dataset to analyze whether GRE scores predict student success and to examine other potential predictive factors.

MOTIVATION AND RESEARCH

The GRE exam has been one of the application requirements for admission to the Master of Engineering Management (MEM) program, waived only for Purdue undergraduates and alumni, since the MEM program's inception 10 years ago.

In their 2014 Nature article, *A Test that Fails*, Casey Miller and Keivan Stassun discuss the magnitude to which women and historically underrepresented minorities underperform on the GRE exam, especially the Quantitative score. They also noted the work of William Selacek showing that the GRE does not accurately predict academic success.

Given the academic research, MEM peer programs moving to GRE optional, and pandemic- and expense- related barriers to taking the GRE, the MEM Admissions Committee was interested in exploring whether a change in GRE requirement could be beneficial for creating a more diverse and successful MEM student body.

PROJECT METHODOLOGY - DATASET CREATION AND ANALYSIS

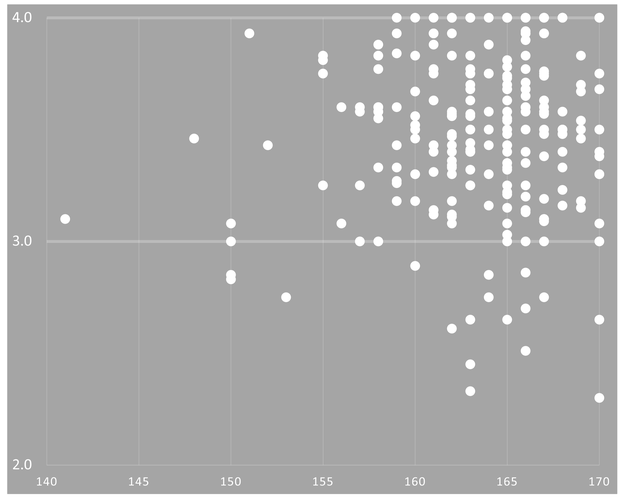
Utilizing student data collected through normal academic processes required obtaining a data usage agreement through the Registrar's Office of Enrollment Management and submitting a human research IRB protocol to the Human Research Protection Program. Pursuing both simultaneously was the most effective approach because neither could be approved without the other.

The protocol was drafted in Cayuse under Category Four Exempt status for secondary research on existing data. Next, I specified the student population, the variables, and their precise database location. The variables were GRE Quantitative, Verbal, AW, and Total scores, first semester and final GPA, undergraduate GPA, first term in masters, age (proxy for years of work experience), gender, ethnicity, citizenship (domestic/international), country of undergraduate institution, Purdue undergraduate indicator, and graduation indicator.

The Registrar approved all variables except ethnicity due to population size and risk of identification. Once the data agreement was signed, I submitted the IRB, and worked with the Graduate School's Information Management and Analysis Office to obtain the data.

Undergraduate GPA was sparsely populated because it is not transferred from the application database to the student databases in the normal course of business. When updating the dataset in the future, I hope to address this issue because one would expect undergraduate success to be predictive. I utilized both graphical and linear regression analysis to examine the data. GPA was regressed on GRE scores, quantitative alone and with verbal as an additional independent variable. GRE scores were regressed on age and gender to explore diversity bias. If available, ethnicity would have been included as one of the independent variables in these regressions.

FIRST SEMESTER GPA and GRE QUANT SCORE



INITIAL RESULTS AND IMPACT

A scatterplot of GRE Quantitative score and first semester GPA illustrates the lack of correlation between the two measures, and most of the lowest GPAs were recorded by students with the highest GRE Quantitative score. As expected based on the graph, GRE Quantitative was not significant in the linear regression analysis. The regressions on age and gender supported diversity-related concerns. While not significant, the coefficient on the female indicator was negative when regressed on GRE score, but positive when regressed on GPA. Also, older students tend to perform less well on the GRE, but better in terms of GPA.

With these initial results as support, the MEM Admissions Committee revised the GRE requirements for the Fall 2023 admission cycle to be GRE optional for students and graduates of U.S. institutions.

Study Protocol: IRB-2022-840. Thanks to Jacqueline McDermott, Ph.D. for serving as PI for the protocol.