Statistically R-Measured Unsuccessful International Business Students in MBA Program

Aleksandar Chonevski

United International College, 3130, Comerce Pkwy, Miramar, Florida, 33025, United States of America

A B S T R A C T

International graduate business students are dropping out of MBA programs at an alarming rate. The purpose of the study was to determine significant predictors of graduate GPA. Scholars suggest that students with higher GPA's will be less likely to dropout; therefore, a set of predictors could be helpful reducing the number of dropouts. United International Business College, of 129 sustainable students was selected to participate in the study. Undergraduate GPA, GMAT scores, GRE scores and TOEFL scores were used to predict graduate GPA's. The multiple regression analysis was conducted to generate a model for predicting graduate GPA's. A significant model was found and results showed that the undergraduate GPA was the most significant predictor. None of the other predictors added significantly to this total.

Perhaps more attention needs to be paid to international undergraduate business students interested in earning a graduate degree so they will remain in school and obtain desired degree.

Keywords: Grade point average, business students, dropout, international students, completion of degree.

1. Abstract

Unfortunately, graduate business schools are losing many students to dropout. This problem is happening especially for the international students in United International College. The purpose of this study is to determine why a business student's GPA along with a high probability of dropout rates correlates with four predictors such as undergraduate GPA, GMAT, TOEFL, and GRE. This study will analyse predictors that might help retain students who are likely to dropout in graduate school so they may complete their business degree. Students who have a higher-grade point average GPA, will be less likely to dropout. In this study, several noteworthy test scores will be used as predictors to generate a model for predicting graduate school GPA: quantitative graduate record examination scores GREQ, graduate management admission test GMAT, undergraduate grade-point average UGPA, and test of English as a foreign language TOEFL. These achievements inform samples of higher education of the factors that contribute to the success of the graduate student.

Nomenclature
GPA – Grade Point Average
GMAT - Graduate Management Admission Test
GRE – Graduate Record Examination
GREQ – Quantitative graduate record examination

1.1 Introduction

Unfortunately, graduate business schools are losing many students to dropout. This problem is happening especially for the international students in a college. The purpose of this study is to determine why a business student's GPA along with a high probability of dropout rates correlates with four predictors such as undergraduate GPA, GMAT, TOEFL, and GRE. This study will analyze predictors that might help retain students who are likely to dropout in graduate school so they may complete their business degree. Students who have a higher-grade point average (GPA) will be less likely to dropout. In this study, several noteworthy test scores will be used as predictors to generate a model for predicting graduate school GPA: quantitative graduate record examination scores (GREQ), graduate management admission test (GMAT), undergraduate grade-point average (UGPA) and test of English as a foreign language (TOEFL). These achievements inform samples of higher education of the factors that contribute to the success of the graduate student.

Research Questions:

1. Is the undergraduate GPA a significant predictor of graduate GPA for international business students?

2. Is the GMAT score a significant predictor of graduate GPA for international business students?

3. Is the GREQ quantitative score a significant predictor of graduate GPA for international business students?

4. Is the TOEFL score a significant predictor of graduate GPA for international business students?

1.2. Literature Review

Limited literature exists to examine the international business school GPA score (Wang, 2013). At the Business College of International University, many students are dropping out for several reasons, the main one being a low GPA. Nearly all aspects of the international student college experience are linked through the GPA. This paper is based on epistemological build out of previous research methods to determine predictors for this significant part of the graduate school experience, graduate school GPA. This study was conducted to determine the predictors of importance and influence that may impact prevention of dropout in the future. Numerous research papers have focused on business predictors of graduate GPA students score. According to Miller (2008) student grades are the best measure of an applicant's potential studies. Therefore, students with better grades will have a higher graduation rate from school and will less likely dropout. This theory is based on a human capital index where Miller argues that GPA a is a measure of student acquired skills and knowledge in the college (Miller & Chia, 2008). Additionally, Onwuegbuzie and Tinto suggest students with higher GPA scores will be less likely to dropout. These findings also support the human capital index theory; this is precisely what Miller and Chia explained. Participants with lower GPA, Tinto (1987) cautions, might have individual student factors, such as personality, which can set students apart from one another and create a "successful – unsuccessful" score of student populations. In so doing, students may bear the brunt of the problem for their lack of satisfactory scores rather than holding the institution equally responsible. Tinto, explains that by creating an institutional curriculum of caring and belonging, which has a universal mission of educating and supporting, students will not dropout. Tinto stated (1999):

"*It is our belief that the price of GPA does preclude the development of learning, but rather it also fits within it in providing support and feedback to instructors in an integrated and comprehensive way*".

Undergraduate business grade point average (UGPA) has also been examined as a criterion for college admission decision making. Researchers

have focused on the viability of undergraduate GPA in predicting business course success. Michael and Mittchel (2017) in the *Journal of Education for Business,* used descriptive analyzes for the undergraduate GPA and successful outcomes of 491 MBA graduates. The results revealed that students with a low undergraduate GPA score performed low in the MBA program. Additionally, the high undergraduate score of business subjects is positively correlated with MBA, and graduate GPA. A higher undergraduate GPA should lead to higher probability for students not to dropout and perform better in schools or colleges.

The graduate management admission test (GMAT) is an assessment commonly used by graduate business schools. According to Lawrence (2012), the interpretation of GMAT scores is very limited. The percentile score only conveys the competitive nature of the score, but it is still used as a method for admitting students into graduate school. The integrated reasoning section uses different test forms designed to measure the same skills, and the results are based on the number of correctly answered questions.

The quantitative portion of the graduate record examination (GREQ) is also a method for admitting students into graduate business schools. A previous study by Williams (1997) pioneered an approach that uses concept orientation to document GREQ scores, and use them systematically in college decision making processes. The findings from his study indicated that colleges used both quantitative and verbal scores to recruit the best and brightest graduate students. Business schools focus much more on the quantitative scores. In addition to personality characteristics, Dollinger, Matyja, and Huber (2008) noted the importance of academic skill profiles (such as verbal ability measured by standardized attitude tests and past academic performance) in evaluating student successes and specific performances on GREQ exams scores. Research has also shown that GREQ scores especially impact the accomplishment of students who may be unprepared for college-level work (Tinto, 1999).

When GRE scores are not up to par, colleges may provide services to facilitate students in building their skills in achievement GREQ scores. There are many courses created to aid students in their learning and writing study strategies. For example, math and writing courses for GREQ are created to build academic skills by reviewing basic concepts that students need to comprehend in higher order concepts.

Another critical component of support programs is instructional tutoring. Tutoring has been found to play a significant role in determining

students' low academic successes, i.e., GREQ score, course completion, and graduation (Hodges, 2001). Rheinheimer and Mann (2000) found

that gender has an effect on tutoring outcomes as their scores. For example, in their study of engineering students, Amenkienan and Kogan (2004) concluded that the use of academic support services had a positive effect on students' academic achievement. They also found that there were differences based on gender, ethnicity, and GPA. A productive learning environment involves establishing and communicating student expectations and providing meaningful feedback (Tinto, 1987). By identifying students who may have insufficient skill levels or personality factors not readily conducive to self-motivated work, institutions can develop and direct a learning environment for all students. The GREQ is used as a part of nominee selection process in departments and also used for the final selection of participant student in business schools including International College, Miramar. The experimental

design method of quantitative research according to Ross and Onwuegbuzie (2012) has argued the intellectual and practical synthesis and provides informative research results. It recognizes the importance of traditional quantitative research and offers a compelling third paradigm choice that will provide the most informative, complete, balanced, and useful research results (Johnson & Onwuegbuzie, 2004 et al.). Researchers have investigated both traditional academic skills of students' analytical, didactic, critical thinking abilities and cognitive components such as personality and motivation (Scepansky & Bjornsen, 2003). Certain factors scores have demonstrated repeated correlation to academic achievement and success. In fact, this use of attributes has been "more predictive in determining successes among students than academic measures alone" (Chamorrow-Premuzic, Furnham, & Ackerman, 2006). Similarly, such measures have explained more of the variance in the success of students with different profiles than academic measures and comparisons alone (Phillips, Abraham, & Bond, 2003). The effect of the two-factor variables in relationship to academic success scores has had varying research results (Ridgell & Lounsbury, 2004).

The Test of English as a foreign language (TOEFL) score, show quantitate scores valued by higher education. This test is obligatory for

international students since English proficiency is key to developing understanding, comprehensive, writing and logic in English speaking countries. Researcher Moglen, (2015), considered the purpose of advising graduate students of northern California University with number of international students. The goal was to explain the positive correlation between the GPA scores and TOEFL test scores a result of changes in the instructional model of English as Second Language (ESL). According to Moglen, findings revealed that TOEFL exam scores, using Pearson *R,* and university placement exam scores 2007-2011, showed moderate correlations between TOEFL and ESL test scores. International students in business school are dropping out more than other students. This noticeable trend is especially true at International College. Many authors have speculated about negative consequences associated with dropout of colleges and the impact on individuals, families and communities (Edmonson & White, 1998, Levin, Belfield, Muennig, & Rouse, 2006; Lochner & Moretti, 2004; Mitra, 2014; Moretti, 2007; Muennig, 2007). Many theories combat dropout as a social issue and necessary in the school system. This investigation started from mid 1980's from Jordan and McPartland (1994) and Watt and Roessingh (1994) who pioneered a framework which articulates how students are either pushed, pulled, or fall out of school.

2. Methods

This study has had attempted to identify predictors of graduate business school GPA. Data was simulated using the means and standard deviations for each DV. Data were collected based on several test predicators from United International College, business students who were participated. This data included four IV predictors from the 129 student's participants: UGPA, GMAT, GREQ and TOEFL sores.

Research Questions

1. Is the undergraduate GPA a significant predictor of graduate GPA for international business students?

Ho1: There is no significant difference between undergraduate GPA predictor and graduate GPA for international business students.

Ho2: There is significant difference between undergraduate GPA predictor and graduate GPA for international business students.

2. Is the GMAT scores a significant predictor of graduate GPA for international business students?

Ho1: There is no significant difference for the GMAT scores as a predictor and graduate GPA for international business students.

Ho2: There is significant difference for the GMAT scores as a predictor and graduate GPA for international business students.

3. Is the GRE quantitative score a significant predictor of graduate GPA for international business students?

Ho1: There is no significant difference for the predictor GREQ score and graduate GPA for international business students.

Ho2: There is significant difference for the predictor GREQ score and graduate GPA for international business students.

4. Is the TOEFL score a significant predictor of graduate GPA for international business students?

Ho1: There is no significant difference for the predictor TOEFL and graduate GPA for international students.

Ho2: There is significant difference for the predictor TOEFL and graduate GPA for international students.

The data was atomized and extracted into an excel spreadsheet for the four IV predictable and analysed. A multiple regression analysis and using-"R" was conducted to create a model for predicting graduate business school GPAs for international students at International College in Miramar.

Descriptive statistics of frequencies, means and standard deviations (sd) were also computed. Responders are asked to indicate how to extend their undergraduate student GREQ scores, dropout and completion is associated with the four predictors, UGPA, GMAT, GREQ and TOEFL scores. Higher scores indicate higher domain. Lower scores indicate a low domain. Instrument was multiple regression analyses conducted. Multiple regression analyses (Cohen and Cohen, 1983) explore to which degree of business graduate combining four predictors (UGPA, GMAT, GREQ and TOEFL) is the most countable and correlated. Follow the stepwise regression to identify the smallest variable that can be predicting business graduate GPA.

2.1 Procedure and Analyses

Procedure was used a multiple regression analysis. To examine of the effect of one DV(s) on a four IV (s). The analyses determined differences found one statistically significant effect which influence on a dependable variable. Linearity or multiple linear regressions requires all variables to be normal which was not the case within the rest of the three predictors. The assumption of linear relationship was tested with scatterplots and was not found a linearity which reveals plots. See figure no 2. The assumption can be check with histogram of residuals or Q-Q plots, can normality be checked and fit into the model, e.g., Kolmogorov-Smirnoff test or the Anderson-Darling test. The assumption is rejected. See figure 3. The multicollinearity acquires when the independent variables are not dependent form each other. We check with Variance Inflation Factor (VIF) is one of the inspection methods (Steven, 2002). VIF=1/T. (T-tolerance=1-R^2. VIF>10). The VIF does not have significant effect. See figure no 3.

Analyses of multiple regression analyses with R value predictors lies between -1 and 1, R-square predictors lies between 0 and 1 and Durbin-Watson statistics, Mahalanobis and Cook's distance will be presented in below in results.

2.2. Results

A regression equation was created for the model using unstandardized partial regression GPA coefficients (b values) as follows: Graduate Business School GPA = 8.479 + (-.526)(GMAT) + (.0002)(UGPA) + (-.177)(GREQ) + (-.008)(TOEFL).

Table 1 – Descriptive statistics & Regression Coefficient for Predicting GPA.

	Zero-Order r					β	b	p-value
Variable	GPA	UGPA	GMAT	GREQ	TOEFL			
GMAT	-.216					-.223	-.526	.011*
UGPA	-.035	.085				.020	.0002	.826
GREQ	-.161	-.026	.256			-.170	-.177	.058
TOEFL	-.118	-.009	-.071	.012		-.117	-.008	.177
						Intercept = 8.479		
Mean	3.33	3.48	499.89	149.91	96.18			
SD	.60	.25	52.17	5.75	8.59			

Significant codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

GMAT Score (standardized β = -.223): This value indicates that as the quantitative GRE score increases by one standard deviation (52.17), graduate student GPA will increase by (-.223) standard deviations. The standard deviation for GPA is 0.60 so this constitutes a change of -0.1338 in GPA (-.223 X .60). Therefore, for every 52.17 points on the GMAT score a decrease of .1338 in GPA is expected. This interpretation is true if the effect of undergraduate GPAs, GRE quantitative scores, and TOEFL scores are held constant.

Undergraduate GPA (standardized β = .020): This value indicates that as the quantitative GRE score increases by one standard deviation (.25), graduate student GPA will increase by .020 standard deviations. The standard deviation for GPA is 0.60 so this constitutes a change of .012 in GPA (.020 X .60). Therefore, for every .25 points in the undergraduate GPA an increase of .012 in graduate GPA is expected. This interpretation is true if the effect of GMAT scores, GRE quantitative scores, and TOEFL scores are held constant.

GRE quantitative score (standardized β = -.170): This value indicates that as the quantitative GRE score increases by one standard deviation (5.75), graduate student GPA will increase by (-.170) standard deviations. The standard deviation for GPA is 0.60 so this constitutes a change of -.102 in GPA (-.170 X .60). Therefore, for every 5.75points on the GMAT score an increase of -.102 in GPA is expected. This interpretation is true if the effect of undergraduate GPAs, GMAT scores, and TOEFL scores are held constant.

TOEFL Score (standardized β = -.117): This value indicates that as the quantitative GRE score increases by one standard deviation (8.59), graduate student GPA will increase by -.117 standard deviations. The standard deviation for GPA is 0.60 so this constitutes a change of -.0702 in GPA (-.117 X .60) Therefore, for every 48.62 points on the GMAT score an increase of .1944 in GPA is expected. This interpretation is true if the effect of undergraduate GPAs, GRE quantitative scores, and GMAT scores are held constant.

Testing of Assumptions in the Multiple Regression Model

The assumption of independence was analysed to determine if there were issues with autocorrelation in the data. A Durbin-Watson test for autocorrelation indicated that the data points were not auto-correlated in a meaningful way. The Durbin-Watson d = 1.866, was outside the two critical values of 1.461 and 1.625, and therefore indicating that there was first order linear auto-correlation in the data. A graphical representation of the studentized residuals

and unstandardized values also indicate the assumption of independence has been violated since there is an observable pattern of points on the graph (Table 1).

The relationship between the dependent and independent variables was analysed to determine linearity of the dataset. The residuals and predicted values of the linear regression model were plotted to reveal systematic patterns data points. The plots were distributed with a roughly constant variance, which indicated there was not an issue with linearity. There was no observable pattern in this plot. This figure shows the relationship between the dependent and independent variables to visualize linearity in the data. The multiple regression model was also tested for normality in the data and to potentially identify outliers in the dataset. Wilks-Shapiro tests for each variable produced significant results ($p < .05$); therefore, the assumption of normality was rejected. Anderson-Darling tests were also conducted to determine normality in the data. The A-D tests also produced significant results ($p < .05$) indicating a problem with normality in the data. A normal Q-Q plot was observed to determine the normality in the data. The points were observed to be in a "S" pattern which indicated a problem with normality in the data. The Mahalanobis distance was calculated to identify multivariate outliers. There were no multivariate outliers found in the dataset. Cook's distance was also calculated and identified no outliers. Although the Mahalanobis and Cook's distances did not reveal outliers in the data, the Wilks-Shapiro tests, the Anderson-Darling tests and the normal Q-Q plot all indicate at the assumption for normality should be rejected. The assumption of homoscedasticity was satisfied for this multiple regression analysis. A plot was generated to observe the variance of the error compared to the predicted values. The values appeared to be consistent throughout the range on the plot, indicating that the predicted values of the model can be trusted. Variance inflation factors were calculated in order to determine the weight of the variables in the multiple regression model. A value of ten was used as the recommended upper bound limit for the VIF value (Stevens, 2002).

3. Concussion

The purpose of the study was to determine the degree of relationships between graduate GPA for business students and undergraduate GPA (UGPA), and success in graduate school, as measured by cumulative graduate GPA, GREQ, GMAT and TOEFL. The results of this correlational analyses differed by degree levels. However, graduate GPA proposed prediction that UGRE scores are valid predictors for all students and was partially supported by the findings from the present study and previous epistemological studies. The significant result associated with UGPA although the correlations were positive, were a stable predictor.

Scatterplot Matrix
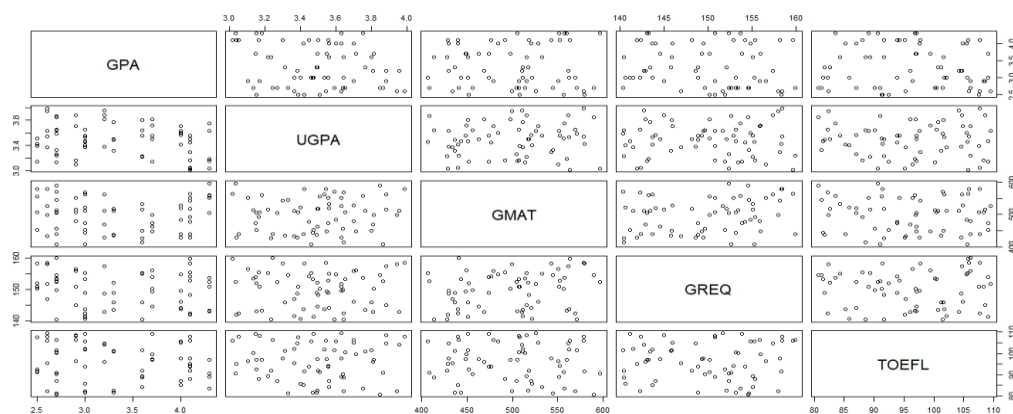
Scatterplot matrix shows plots are not liner.

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