

Relationship Between Admission Factors, GPA, and Retention

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At the request of the Vice President for Admission and Student Financial Planning and the Faculty Senate Admissions and Financial Aid Committee, an analysis was done of the usefulness of pre-college academic performance of enrolled students to predict one-year GPA, retention, and GPA at time of graduation. The objective was to determine the utility of standardized test scores in the admission process. The data for the analysis includes the entering first-year cohorts between Fall 2006 and Fall 2012.

Correlation Among Academic Performance Variables

Table 1
Correlations Among ACT, High School GPA, One-year GPA, and GPA at Graduation (with sample size)

	ACT	High school GPA	One-year GPA
High school GPA	.472 (5681)		
One-year GPA	.412 (5658)	.505 (5801)	
GPA at Graduation	.448 (2137)	.555 (2185)	.824 (2263)

One-Year GPA

A multiple regression analysis was conducted to evaluate how well the variables predicted one-year cumulative GPA. The linear combination of predictor variables was significantly related to one-year GPA, $F(11, 4395) = 185.96, p < .001$. The multiple correlation coefficient was .564, indicating that approximately 31.8% of the variance in one-year GPA can be accounted for by the linear combination of predictor variables. Significant predictor variables in the model include: ACT, High School GPA, Gender, White/Student of Color, On or Off-Campus, Orientation, and STEM.

Table 2
The Bivariate and Partial Correlations of the Predictors with One-Year Cumulative GPA (n = 4846)

Predictors	Correlation between each predictor and one-year cumulative GPA	Correlation between each predictor and one-year cumulative GPA controlling for all other predictors
ACT	.418	.226
High School GPA	.514	.385
Gender	.091	.035
White/Student of Color	.117	.034
Citizenship	-.008	-.029
In or Out-of-State	-.018	-.017
On or Off-Campus	-.084	-.060
Orientation Attendance	.093	.056
Fraternity/Sorority	.011	.002
Athlete	-.077	-.014
STEM	.044	-.107

Two separate regression analyses examined the difference in the relative strength of individual predictors when comparing STEM and non-STEM majors. The model for STEM majors explained 31% of

the variance, while the model for non-STEM majors explained 32% of the variance. Bivariate and Partial Correlations for ACT and High School GPA scores are presented in Table 3.

Table 3

The Bivariate and Partial Correlations of Selected Predictors with One-Year Cumulative GPA by STEM

STEM or Not STEM	Predictors	Correlation between each predictor and one-year cumulative GPA	Correlation between each predictor and one-year cumulative GPA controlling for all other predictors
STEM (n = 1700)	ACT	.424	.262
	High School GPA	.492	.378
Not STEM (n = 2695)	ACT	.415	.206
	High School GPA	.530	.388

Retention

Logistic regression was conducted to determine which independent variables were predictors of retention. Results indicate that five variables (ACT, Fraternity/Sorority, White/Student of Color, Orientation, and One-year GPA) were predictors of one-year retention. However, Nagelkerke r-square value (.159) and odds ratios indicate limited change in retention. It is also important to note that logistic regression is sensitive to high correlations among predictor variables. In a separate model without one-year cumulative GPA, High School GPA was also a significant predictor variable.

In addition, a discriminant analysis was conducted to determine whether the variables could predict retention. Similar to the logistic regression, the variables accounted for a small amount of the variance (9%). Correlation coefficients presented in Table 4 affirm that one-year cumulative GPA, ACT, high school GPA, Fraternity/Sorority, and Orientation are associated with the discriminant function.

Table 4

Correlation Coefficients with One-Year Cumulative GPA Discriminant Function (n = 4395)

Predictors	Correlation Coefficients with Discriminant Function
One-year Cumulative GPA	.896
ACT	.416
High School GPA	.399
Fraternity/Sorority	.361
Orientation	.239
On or Off-Campus	-.129
Athlete	-.096
In or Out-of-State	-.080
STEM	.054
White/Student of Color	.043
Citizenship	-.041
Gender	.013

GPA at Graduation

A multiple regression analysis was conducted to evaluate how well the variables predicted GPA at the time of graduation. The linear combination of predictor variables was significantly related to GPA at time of graduation, $F(11, 1582) = 91.94, p < .001$. The multiple correlation coefficient was .624, indicating that approximately 38.5% of the variance in GPA at time of graduation can be accounted for by the linear combination of predictor variables. Significant predictor variables in the model include: ACT, High School GPA, Gender, Orientation, Fraternity/Sorority, and STEM.

Table 5

The Bivariate and Partial Correlations of the Predictors with GPA at Graduation (n = 1594)

Predictors	Correlation between each predictor and GPA at Graduation	Correlation between each predictor and GPA at Graduation controlling for all other predictors
ACT	.470	.289
High School GPA	.560	.401
Gender	.167	.141
White/Student of Color	.111	.025
Citizenship	-.036	-.048
In or Out-of-State	.024	.020
On or Off-Campus	-.028	-.006
Orientation Attendance	.054	.063
Fraternity/Sorority	-.100	-.062
Athlete	-.090	-.021
STEM	.037	-.093