UNIVERSITY FRESHMAN RETENTION IN NORTH CAROLINA

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Abstract- On the sixteen campuses of the University of North Carolina, student retention is becoming a strategically critical factor. For the period from 1998 to 2004, the University of North Carolina System had an average campus freshman retention rate of 80.1%. Some campuses have lower average freshman retention rates than other campuses apparently due to the level of freshman high school preparation as reflected by SAT scores. A linear regression model to predict an expected campus freshman retention rate was produced using average campus SAT scores.

Keywords: student retention, SAT, freshman retention, University of North Carolina

INTRODUCTION

State and local tax burdens hit a 25-year high, according to a Tax Foundation study released April 4, 2007 [Dubay, 2]. Taxpayers want to know their tax dollars are well spent. In North Carolina, retention of students at the University of North Carolina campuses is of utmost importance for institutional administrators to ensure efficient stewardship of taxpayers' funds. Retention of students is becoming a fundamental consideration for all university faculty and staff at North Carolina higher education institutions.

The University of North Carolina was chartered in 1789 and was the first public university in the United States [UNC, 5]. The University has grown to sixteen campuses located throughout the state. Accrediting organizations and taxpayer considerations have propelled cost efficiency measures, such as student retention, to the forefront of strategic plans for the state's universities. Over 190,000 students were recently served by University campuses. Of this number of students, about 43,000 were freshman undergraduates [UNC, 5]. Based upon average campus retention rates of 80.1%, over 8,000 freshman students would be expected to drop out in their first year. At a conservative estimate of $10,000 per year in average tuition and expenses per student, this dropout rate could cost as much as $80,000,000 annually to taxpayers in North Carolina.

"Seventy-five percent of students who drop out of college do so during their first two years" of college [Mattson, 4, pg 9]. Factors such as student economic situation [SES], gender, race, high school grade point average and SAT scores have been linked to student retention [Astin, 1; Mattson, 4; Johnson & Molnar, 3]. First year college grade point averages have also been found to be good predictors of retention [Mattson, 4; Johnson & Molnar, 3]. While retention rates predicted by standardized tests have been questioned recently [Mattson, 4; Vogel, 6], combined math and verbal SAT scores may provide a reliable prediction of freshman university student retention.

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METHODOLOGY

Annual average first-time freshman retention rates and combined math and verbal SAT scores were obtained from the system website for all sixteen campuses of the University of North Carolina dating from the Fall semester of 1998 to the Fall semester of 2004. The 112 data points were tabulated in an Excel spreadsheet. Initial observation of a graph of retention rates versus SAT scores did not immediately indicate a detectable pattern over the period of analysis. By manipulating the data, several different graphs of retention rates versus SAT scores were generated to identify trends. The method of least squares was used to create trend lines within the graphs generated. These graphs were then used to determine a linear relationship between first-time freshman retention rates at University of North Carolina campuses and combined SAT scores. Pearson's Correlation Coefficients (r) and coefficients of determination (R^2) were also determined for the data sets. A best fit model was found which considered only combined SAT scores above 1000 points to predict retention rates.

RESULTS

A relatively low coefficient of determination describing the relationship between all retention rate data points and all combined SAT scores was found to be 0.4753. The graph is shown in Figure 1.

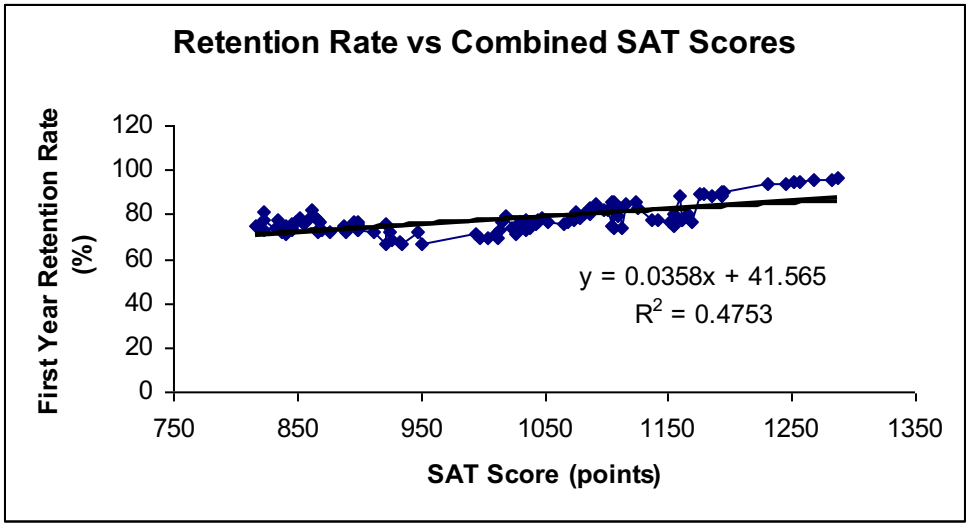

Figure 1

The data set was adjusted to only include average combined SAT scores above 1000 points and another graph, including trend line, was produced to compare retention rates and SAT scores. The coefficient of determination was determined to be 0.7012. The graph is shown below:

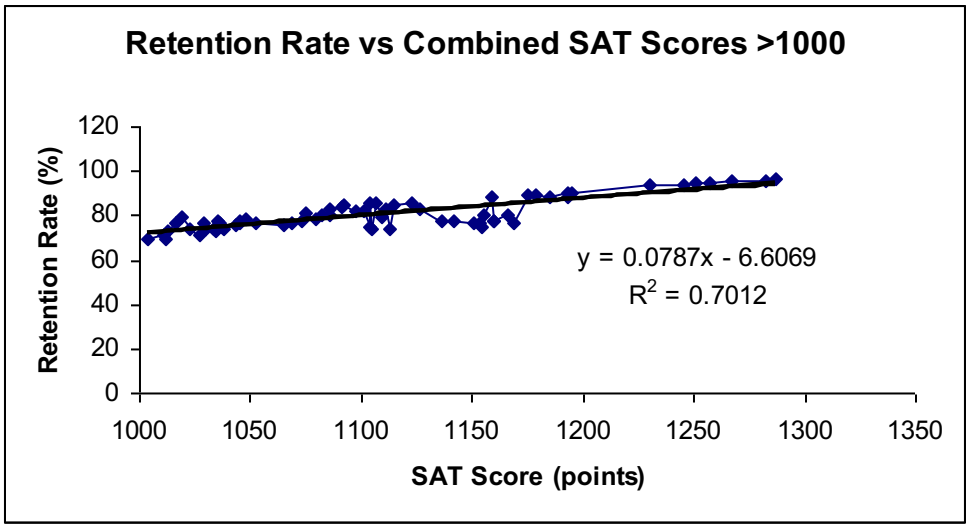

Figure 2

The coefficient of determination for the second scenario shown, Figure 2, is 0.7012. The regression model, y = 0.0787x – 6.6069, provides very good predictions of retention rates when actual scores are plugged into the equation. Administrators at University of North Carolina University institutions with combined SAT scores above 1000 points may use this equation to predict their expected first year freshman retention rates. While predicting retention using the derived equation is not without risks, it may be used to benchmark campus retention.

CONCLUSIONS

In the future, administrators at institutions with SAT scores above 1000 points may produce regression models at their institutions to use to judge their institutions' retention performance. As tuition dollars become more and more limited, policies may be emplaced by public institutions which would limit admittance of students with lower SAT scores or require attendance at two-year institutions prior to entering a university. This measure could save tens of millions of dollars in North Carolina. In addition, administrators may learn methods to retain students from institutions with lower SAT scores but with higher retention rates. For example, the data set included an institution with average freshman SAT scores of 822 and retention rates in excess of 81 percent. This retention rate is much higher than would be predicted by the regression model produced by this study.

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APPENDIX

Retention Rates for entering freshman at UNC Institutions

	1998	1999	2000	20001	2003	2004
Appalachian	81.3	84.8	83.3	81.7	84.4	85.8
East Carolina	79	76.4	78	76.7	78.7	75.9
Elizabeth City	72.9	77.3	81.4	73	76.3	74.7
Fayetteville	74.2	72.6	71	73.9	72.7	75.4
N.C. A and T	75.5	72.3	76.6	76	73.1	72.5
N.C. Central	77	72.3	78.5	81.8	77.8	75.9
N.C. School of the Arts	77.4	79.6	75.2	74.3	76.9	73.9
N.C. State	88	88.9	88.7	89.1	90.2	88.7
UNC-Asheville	77.8	76.8	80.2	77.8	79.9	76.4
UNCC	73.4	73.1	77.7	76.4	77.1	78.7
UNC-CH	93.9	94	95	94.7	95.2	96.5
UNC-Greensboro	74	73.9	74.9	73.8	76.9	77.4
UNC-Pembroke	66.8	67.6	68.6	72.2	67.1	72.3
UNC-Wilmington	80	79.9	81.8	83.9	85.7	83.2
Western Carolina	69.6	71.5	69.4	71	73.9	70.9

Combined Math/Verbal SAT scores for entering freshman at UNC Institutions

	Fall 1998	Fall 1999	Fall 2000	Fall 2001	Fall 2002	Fall 2003	Fall 2004
Appalachian	1075	1092	1086	1101	1111	1115	1123
East Carolina	1019	1016	1035	1029	1036	1048	1043
Elizabeth City	823	823	822	837	817	848	841
Fayetteville	833	867	840	845	868	867	845
N.C. A and T	922	911	896	898	899	899	889
N.C. Central	898	876	860	861	852	834	855
N.C. School of the Arts	1136	1109	1104	1113	1154	1153	1105
N.C. State	1159	1179	1185	1175	1193	1195	1193
UNC-Asheville	1142	1151	1155	1160	1160	1166	1169
UNCC	1013	1034	1073	1052	1065	1069	1079
UNC-CH	1230	1245	1251	1257	1267	1282	1287
UNC-Greensboro	1030	1038	1037	1033	1035	1045	1045
UNC-Pembroke	921	932	927	924	934	950	948
UNC-Wilmington	1082	1086	1097	1091	1106	1104	1126
Western Carolina	998	994	1004	1011	1012	1023	1027
Winston-Salem	845	8387	869	865	868	867	888
U.S. Average [All Test Takers]	1017	1016	1019	1020	1020	1026	1026
N.C. Average [All Test Takers]	982	986	988	992	998	1001	1006
UNC Average	1064	1068	1073	1071	1072	1075	1079