Features

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How Well Does the GRE Work for Your University?
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A Longitudinal Study of Non-Cognitive Variables in Predicting Academic Success of First-Generation College Students
Siu-Man "Raymond" Ting

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The University of Texas at Austin

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Editor’s Note

It is said that we live in interesting times, and certainly we live in interesting professional times. Although the outcome of the affirmative action criteria review by the Supreme Court of the admissions policies practiced by the University of Michigan is unknown at the time I write this editor comment, what is known is that the impact of the decision will have wide and lingering repercussions. It will challenge or support admissions practices within higher education and create a stage for debate and decision for the foreseeable future. It is a reminder to me of the value of C&U as a vehicle for research, comment, and information so necessary to the higher education professional.

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  Saira Burk, C&U Managing Editor, AACRAO, One Dupont Circle, NW, Suite 520, Washington, DC 20036; Tel: (240) 683-8885; E-mail: burkis@aacrao.org
The following discussion will proceed first with a literature review on market analyses, market segmentation, and the identification of choice factors important to students. This will be followed by the methods and findings on one institution’s image and market position, its competition, and market segments. The analysis concludes with a discussion of the results and how the information is relevant to practitioners. This research contributes to the college choice literature by identifying several factors that are important to consider in college choice surveys and, therefore, expands upon the work of Paulsen (1990).

Market Analysis

Clark and Hossler (1990) explain how institutions position themselves in the educational marketplace. For example, a college can position itself “as an elite college…, a low-cost pathway to upward mobility…, [or] church-related school” (Clark and Hossler 1990, p. 78). According to Kotler (1982) an institution markets itself by “designing the organization’s offerings in terms of the target markets’ needs and desires, and… using effective pricing, communication, and distribution to inform, motivate, and service the markets” (p. 6).

Colleges and universities use various means to market their services. Although the junior year is typically when students “become familiar with the characterstics of different colleges and universities,” students may begin receiving information in their sophomore year of high school (Bradshaw, Espinoza, and Hausman 2001; Chapman 1981, p. 63). Institutions may use the American College Testing Program Student Profile (ACT Profile) information to contact high school students as well as parents when the student lists the institution on his or her choice set. Staff may participate in college visit days with students at local high schools, or contact high school counselors or employers in the area. In addition, the college Web site has become one of the most helpful or influential sources of information (Seymour 2000); student visits to campus have been shown to be an influential factor in student college choice (Jonas and Popovics 1990; Kellaris and Kellaris 1988); and receipt of the semester course schedule in the mail has proven to be highly effective (Lucas 1984). Colleges and universities also inform students via college guides, brochures, and college catalogs sent in the mail (Johnson, Stewart, and Eberly 1991; Jonas and Popovics 1990; Stoyanoff 1980). Other possibilities involve activities or events on campus, literature at work or in the high schools, advertisements in the newspaper, on radio and television, student telemarketing, scholarship interviews, early registration programs, and use of alumni networks (Abrahamson and Hossler 1990; Lucas 1984). The institution may also contact students who applied but failed to enroll at the institution, using data from admission applications.

To effectively publicize services, an institution must first understand its student markets. An understanding of student markets often involves survey research. Institutions may develop their own in-house survey or use one of the standardized instruments available such as the Admitted Student Questionnaire (ASQ) or Cooperative Institutional Research Program Freshmen Survey (CIRP). The Admitted Student Questionnaire Plus (ASQ Plus) also allows institutions to obtain student ratings on competing institutions. The ACT Profile and the College Board’s Student Descriptive Questionnaire (SDQ) include information on college choice; however, the number of questions regarding institutional characteristics is more limited as compared with the ASQ or CIRP. Students do not rate the importance of college characteristics on the SDQ, whereas this rating comprises the basic design of other instruments. The National Center for Education Statistics (NCES), in its National Educational
Longitudinal Study (NELS), also requests information on college choice factors. Matthews and Hadley (1993) developed the Student Perceptions of Institutional Quality (SPIQ) instrument to compare state institutions on several measures of quality.

The typical information sought from surveys not only includes student perceptions about colleges and universities, but also data on high school preparation, student characteristics, majors, interests, financial aid offers, institutions where students plan to attend, the effectiveness of recruiting methods, sources of information used by students, and the influence of people in the choice process, etc. Researchers may not only ask how important various factors are in a student’s choice of an institution, but also the extent to which a specific institution is believed to have these attributes—the expectancy value model (Braxton 1990; Cook and Zallocco 1983; Muffo and Whipple 1982). Other researchers have used the ideal point preference model to measure a student’s concept of an “ideal college” and then compare institutions against it (Braxton 1990; Coombs 1964; Kuntz 1987).

When the same student rates two competing institutions, the researcher can calculate a difference score. This score is valuable in prediction and is used to display a balance sheet on competing institutions (Litten 1979; Welki and Navratil 1987). The difference is a descriptive statistic showing whether a competitor is outdrawing another institution or attracting more students who have both institutions in their choice set (Coombs and Maguire 1980; Lolli and Scannell 1983).

Advanced statistics provide further understanding of the data. Researchers may employ regression, discriminant, probit, and logit analysis to predict matriculation at the institution (Maguire and Lay 1981; Perry and Rumpf 1984; Smith and Matthews 1990; Trusheim, Crouse, and Middaugh 1990; Welki and Navratil 1987). Factor analysis (which combines several measures into a construct) is used to identify market segments or to combine several related questions into one factor for prediction (Absher and Crawford 1996; Douglas, Powers, and Choroszy 1983; Maguire and Lay 1981). Multi-dimensional scaling produces a visual map of institutions, which shows the similarity or dissimilarity among competing institutions (Braxton 1990; Coombs 1964; Kuntz 1987; Leister 1975; Litten 1979). Regardless of the methods, the ultimate goal is to gain a clear picture of an institution’s image and its position relative to competitors.

Market Segmentation

The purpose of segmentation is to identify differences in the attitudes and perceptions of students in each distinct group to either emphasize those aspects most attractive to the particular segment, or to “adjust the characteristics of the college” in an effort to make the institution more appealing (Paulsen 1990, p. vi). Kotler (1982) identifies several types of segmentation: demographic, geographic, psychographic, and behavioral. The first two involve creating subgroups based on location or student characteristics. “Attitudes and lifestyles” distinguish students in psychographic segments (Braxton 1990, p. 88). “Behavioral segmentation entails the division of markets into groups based on their knowledge, attitude, or use of a particular product” (Braxton 1990, p. 88).

Several studies have been conducted that differentiate among student groups, with demographic segmentation being the most common. For example, research shows that Black and/or Hispanic students are more responsive to grants and scholarships and are more cost conscious in their college selection than White students (Cibik 1982; Johnson, Stewart, and Eberly 1991; Lewis and Morrison 1975; Litten 1982; Smith and Matthews 1990; St. John and Noell 1989). Cibik (1982) reports that, “Black, Mexican American, and American Indian groups all indicated that the ‘percentage and kinds of minority students at the college’ was more important to them” (p. 101). American Indian students rated admission requirements higher in importance than did other groups. In a study by Hearn (1984), Blacks “were less likely to attend…more selective institutions” (p. 25). He also found a substantial difference in income levels between Black and White students.

Summarizing several studies, Paulsen (1990) reports that academically gifted students are more likely to attend highly selective and out-of-state institutions. The choice factors more important to these students include academic reputation, quality of the student body, availability of honors programs, and scholarship awards (Baksh and Hoyt 2001; Bradshaw, Espinoza, and Hausman 2001; Keller and McKewon 1984; Litten 1982; Litten and Brodigan 1982; Litten, Sullivan, and Brodigan 1983; Maryland Commission 1996). Paulsen (1990) also states that students from low- and middle-income groups are less likely to attend selective and more costly institutions as compared with high-income students.

Research also examines student preferences by age, sex, and religious affiliation. For older and part-time working adults, location and vocational training appear to be more important (Amarillo College 1980). Daigle (1982) finds that older, non-traditional students “are attracted primarily by practical concerns (program availability...convenience, close to home, and work)” (p. 15). However, these studies conflict regarding the importance of cost to older students. Johnson, Stewart, and Eberly (1991) and Lewis and Morrison (1975) cite several choice factors by gender, but a clear pattern does not seem to emerge from the results. Litten and Brodigan (1982) explore religious differences, but the results may be primarily influenced by the economic status of the groups (Paulsen 1990).

Psychographic and behavioral segmentation appear to be less common. Gilmour, Spiro, and Dolich (1981) and Litten (1982) evaluated college choice by grouping students according to parental education level and attendance at private high schools. Hossler, Braxton, and Coopersmith (1989) evaluated students based on their social class. However, demographic segmentation by income level achieved similar findings. Absher and Crawford (1996) used factor analysis to group students as practical-minded, advice seekers, campus magnets, good-timers, and warm friendlies. These students had characteristics that led them to select particular institutions.

Reviewing additional studies using geographic segmentation, Paulsen (1990) reports that students living outside of the local market area are more likely to attend when they are male, the parents have higher levels of education and exhibit higher income levels, and students have higher educational aspirations.
and academic ability. Hodges and Barbuto (2002) report that a campus visit may be more of a factor in the college choice decision of rural students than for urban students.

Identifying College Choice Factors

Although the literature review provided an understanding of the marketing framework and analytical methods, it raised concerns about the limited number of choice factors used by many institutions when surveying students. The authors found 27 studies with less than ten choice factors. This was contrasted against studies with 20 or more choice factors (Absher and Crawford 1996; Cibik 1982; Douglas, Powers, and Choroszy 1983; Jonas and Popovics 1990; Maryland Commission 1996; Metlay et al. 1974; Tatham 1979).

Standardized instruments have a limited set of factors. The ACT Profile has six factors with an “other” category. The ASQ Plus details thirteen choice factors on college characteristics with the possibility of entering other individualized factors. The NELS has fifteen choice factors (excluding parents’ prior attendance and counting questions centering on location once). The CIRP survey lists seventeen choice factors for rating institutional characteristics (excluding those focusing on the influence of relatives, teachers, high school counselors, private counselors, and the Web site). The SPIQ has eighteen factors (counting measures for quality of faculty once).

A more comprehensive set of factors could result in improved prediction of student college choice and a more accurate picture of those institutional characteristics students believe are important in the college selection process. Therefore, the choice factors used by institutions for in-house college choice surveys were identified in the literature.

The literature review resulted in a total of 22 studies (including the current study) using ten or more factors (Table 1). Using these studies, the number of times a factor placed in the number one spot, top three, top five and top ten was summarized. The factors were then sorted in a spreadsheet so that the factors appearing most frequently in the number one spot were listed first, followed by those factors appearing most frequently in the top three, top five, and top ten. Only choice factors from studies with fifteen or more factors were listed in the top ten category. The studies varied in terms of the scale that students used to rate institutions; thus, the final ranking was used to summarize the findings, regardless of the underlying scale. Standard categories were inductively developed from the alternative ways to ask questions. The studies used different survey methods, sampling methods, and sample sizes, and were conducted on different student populations. The results represent the ratings of 30,614 students in eighteen states.

Nine factors placed in the number one category across several studies (the most frequent listed first): academic reputation, location, quality of instruction, availability of programs, quality of faculty, costs, reputable program, financial aid, and job outcomes. The next twelve most important factors across the 22 studies were: variety of courses offered, size of the institution, surrounding community, availability of graduate programs, student employment opportunities, quality of social life, class size,

Table 1: College Choice Studies Summary

<table>
<thead>
<tr>
<th>Author(s), Year</th>
<th>Factors</th>
<th>Institution Type</th>
<th>Location</th>
<th>Respondents</th>
<th>Survey Method</th>
<th>Sampling Method</th>
<th>Sampling Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absher and Crawford, 1996</td>
<td>23</td>
<td>Community colleges</td>
<td>Alabama</td>
<td>College students</td>
<td>In-class</td>
<td>Random</td>
<td>675, NR</td>
</tr>
<tr>
<td>Alaska Commission, 1983</td>
<td>13</td>
<td>High schools</td>
<td>Alaska</td>
<td>HS seniors</td>
<td>—</td>
<td>Population</td>
<td>3,505, 60%</td>
</tr>
<tr>
<td>Amarillo College, 1980</td>
<td>11</td>
<td>Community college</td>
<td>Texas</td>
<td>College students</td>
<td>Mailed</td>
<td>Population</td>
<td>3,013, 76%</td>
</tr>
<tr>
<td>Brookdale Community College, 1983</td>
<td>12</td>
<td>High schools</td>
<td>New Jersey</td>
<td>HS seniors</td>
<td>In-class</td>
<td>Random</td>
<td>712, NR</td>
</tr>
<tr>
<td>Canale, Britt, and Donahue 1996</td>
<td>11</td>
<td>Local high schools</td>
<td>New York</td>
<td>HS juniors/seniors</td>
<td>—</td>
<td>—</td>
<td>543, NR</td>
</tr>
<tr>
<td>Cibik, 1982</td>
<td>30</td>
<td>High schools</td>
<td>Arizona</td>
<td>HS students</td>
<td>HS visits</td>
<td>Random</td>
<td>708, NR</td>
</tr>
<tr>
<td>Cook and Zallocco, 1983</td>
<td>15</td>
<td>Colleges</td>
<td>Ohio</td>
<td>Freshmen</td>
<td>—</td>
<td>—</td>
<td>241, NR</td>
</tr>
<tr>
<td>Cunningham and Fickes, 2000</td>
<td>18</td>
<td>State college</td>
<td>Pennsylvania</td>
<td>Non-attendees</td>
<td>Mailed</td>
<td>Population</td>
<td>851, NR</td>
</tr>
<tr>
<td>Current Study, 2002</td>
<td>24</td>
<td>State college</td>
<td>Utah</td>
<td>New freshmen</td>
<td>Phone mailed</td>
<td>Random</td>
<td>494, 45%</td>
</tr>
<tr>
<td>Daigle, 1982</td>
<td>16</td>
<td>Colleges</td>
<td>California</td>
<td>College students</td>
<td>In-class</td>
<td>Random</td>
<td>8,564, NR</td>
</tr>
<tr>
<td>Douglas, Powers and Choroszy, 1983</td>
<td>28</td>
<td>High schools</td>
<td>Arizona</td>
<td>Gifted HS seniors</td>
<td>Mailed</td>
<td>Population</td>
<td>165, 52%</td>
</tr>
<tr>
<td>Johnson, Stewart and Eberly, 1991</td>
<td>13</td>
<td>University</td>
<td>Midwest</td>
<td>Freshmen</td>
<td>Orientation</td>
<td>Population</td>
<td>3,708, 55%</td>
</tr>
<tr>
<td>Jonas and Popovics, 1990</td>
<td>21</td>
<td>Independent college</td>
<td>Wisconsin</td>
<td>Freshmen</td>
<td>Mailed</td>
<td>Population</td>
<td>100, 43%</td>
</tr>
<tr>
<td>Lucas, 1984</td>
<td>18</td>
<td>Community college</td>
<td>Illinois</td>
<td>College students</td>
<td>Mailed</td>
<td>Random</td>
<td>440, 88%</td>
</tr>
<tr>
<td>MacKenzie, 1985</td>
<td>15</td>
<td>University</td>
<td>California</td>
<td>Admitted students</td>
<td>Phone</td>
<td>Random</td>
<td>726, 78%</td>
</tr>
<tr>
<td>Maryland Commission, 1996</td>
<td>21</td>
<td>High schools</td>
<td>Maryland</td>
<td>HS seniors</td>
<td>Mailed</td>
<td>Population</td>
<td>366, 61%</td>
</tr>
<tr>
<td>McCullagh, 1989</td>
<td>17</td>
<td>University</td>
<td>Iowa</td>
<td>Undergraduates</td>
<td>In-class</td>
<td>—</td>
<td>205, NR</td>
</tr>
<tr>
<td>McMaster, 1984</td>
<td>14</td>
<td>Community college</td>
<td>New Jersey</td>
<td>Non-attendees</td>
<td>Mailed</td>
<td>Population</td>
<td>228, 22%</td>
</tr>
<tr>
<td>Metlay et al., 1974</td>
<td>32</td>
<td>University</td>
<td>New York</td>
<td>Freshmen/ transfers</td>
<td>Phone</td>
<td>Population</td>
<td>1,211, 29%</td>
</tr>
<tr>
<td>Smith and Matthews, 1990</td>
<td>14</td>
<td>University</td>
<td>Southwest</td>
<td>Freshmen</td>
<td>Phone</td>
<td>Random</td>
<td>544, 71%</td>
</tr>
<tr>
<td>Tatham, 1979</td>
<td>20</td>
<td>Local high schools</td>
<td>Kansas</td>
<td>HS juniors &amp; seniors</td>
<td>Mailed</td>
<td>Population</td>
<td>2,000, NR</td>
</tr>
<tr>
<td>Terkla and Wright, 1986</td>
<td>12</td>
<td>University</td>
<td>Massachusetts</td>
<td>Admitted students</td>
<td>Mailed</td>
<td>Population</td>
<td>1,615, 55%</td>
</tr>
</tbody>
</table>

1 Only factors measuring institutional characteristics are included in the total.
2 The sample size is listed first followed by the response rate, NR = response rate not reported.
admission to graduate school, extracurricular programs, friendly/ personal service, affiliation (with another reputable institution), admission requirements, and attractiveness of campus facilities.

Several of these choice factors are not included on standardized instruments discussed above. Factors included on the standardized instruments also never made the top ten ranking for studies in the review. Due to these results, the researchers believe that more work is needed to fully develop a standardized instrument for studying college choice. The authors also believe that in-house instruments provide useful information that supplements national data sets.

Methods
The Office of Institutional Research (OIR) at Utah Valley State College (UVSC) (a large, predominantly White, open-admissions four-year institution) developed its own in-house instrument. The process entailed collecting surveys from other institutions, developing a draft instrument, and reviewing it with the student recruitment officers on campus. The OIR did not include the following relevant choice factors, which were found to be important in other studies: job outcomes, surrounding community, admission to graduate school, friendly/personal service. Despite failing to include these variables, the OIR study ranks among research considering the most college choice variables (twenty or more).

ACT provided data on all high school students who completed the ACT exam and had UVSC in their choice set during the 1999–2001 school years. The data were joined with information from the National Student Loan Clearinghouse (NSLC) [now known as the National Student Clearinghouse], the Utah State Board of Regents (USBR), and a private university in the area (BYU) to identify the college that students selected for their college career. These data were also joined with other information available from the UVSC Student Information System (SIS).

The final sample for the survey was taken from all 2001 Utah high school graduates who had UVSC in their choice set and attended college in the state. Of the 1,098 randomly selected prospective students, the OIR obtained responses from 494 students (45 percent overall response rate). The OIR selected four samples using stratified random sampling by geographic area with the following results: (1) live outside Utah County, matriculants ($N = 148$, response rate 44 percent), (2) live outside Utah County, non-matriculants ($N = 131$, response rate 58 percent), (3) live in Utah County, matriculants ($N = 129$, response rate 52 percent), and (4) live in Utah County, non-matriculants ($N = 106$, response rate 48 percent). The goal was to achieve at least 100 respondents in “each major subgroup and 20 to 50 in each minor subgroup” as recommended by Sudman (1976) and Borg and Gall (1989, p. 233). The OIR gave non-matriculants a free Blockbuster movie pass to encourage their response to the mailed survey and follow-up phone calls.

The analysis utilized market segmentation. Students were grouped by geographic location, gender, degree aspirations ($1 =$ bachelors or higher, $0 =$ other), and academic ability using composite ACT scores: (1) $\leq 19$ Low Ability, (2) 20–23 Average Ability, and (3) $\geq 24$ High Ability. Low-, middle-, and high-income students were defined as students whose parental income was: (1) $\leq 36,000$, (2) $36,000$ to $60,000$, and (3) $60,000$ or more. Sample sizes were too small for meaningful analysis by ethnicity. This research also focuses on recent high school graduates; therefore, segmentation by age is not evaluated in the study.

There was no difference in the average ACT score when comparing respondents and non-respondents, and there were only small differences between the groups in the average age of students, sex, and high school GPA. Therefore, it is believed that the random samples are generally representative of students with UVSC in their college choice set.

The results are presented first using descriptive statistics to illustrate student ratings of college choice factors. Important findings using demographic segmentation are presented in the analysis using ANOVA and t-tests. Individual t-tests were not run unless the ANOVA was significant (Keppel 1991). If the Levene’s Test for Equality of Variances showed significance, equal variances were not assumed for the t-tests and the results of the non-parametric tests are reported. This research is exploratory reporting both significance levels: $p \leq 0.05$ and $p \leq 0.01$.

To avoid excessive presentation of tables, results on all choice factors are presented only by geographic origin. The major differences for other groups are then highlighted without presentation of tables. A choice factor is highlighted if the following criteria are met: (1) There is at least a half point difference in the averages among the groups, (2) The factor places in the top ten ranking for at least one of the groups, and (3) The difference between means test is significant at the .05 or .01 level.

Choice Factors Important to Matriculants
UVSC students rate the cost of tuition and ability to work while attending school as two of the most important factors in their choice to attend UVSC (Table 2). Receiving a scholarship is another financial consideration rated among the top ten. Despite rising tuition, the cost of tuition at UVSC is lower than other four-year options in the state, which appears to be an important characteristic of the college in attracting students. The availability of a student’s major or program also rates in the top ten. A good quality program at a competitive price is a fitting description of what students are looking for at UVSC. The variety of course offering times (night, weekend, Internet, etc.), small class sizes, and safety of the campus also rate in the top ten, regardless of where the student originated in the state.

There were generally small differences in factors considered important between students living in Utah County as compared to students from outside the county. One expected difference is that students from outside the county value the ability to commute home on weekends ($t = 7.552, p \leq 0.01$); yet, the students prefer living away from home ($t = 8.889$). Thus, the availability of housing becomes more important for out-of-county students ($t = 8.023, p \geq 0.01$). Students living in the local area generally place greater importance on their ability to live at home while attending college ($t = 10.371, p \leq 0.01$). Prior high school concurrent enrollment credit is more of a factor for students from Utah County ($t = 4.059, p \leq 0.01$).

Significant differences also existed among other market segments. The safety of the campus is substantially more important to females ($t = 1.98, N = 169$) than males ($t = 2.82, p = 5.67, p \leq 0.01$, $t = 2.82, p \leq 0.01$).
N = 106). Campus safety fails to make the top ten for males attending the college. High-ability students are less concerned with the variety of course offering times (2.70, N = 56) as compared to low-ability (2.10, t = 2.966, p < 0.01, N = 124) and average-ability students (1.99, t = 3.389, p < 0.01, N = 96). Gifted students also rate the cost of tuition as less important (2.38) as contrasted with low-ability (1.72, t = 3.452, p < 0.01) and average-ability students (1.67, t = 3.474, p < 0.01). Receiving a scholarship is ranked as the most important college choice factor for high-ability students attending UVSC (1.80), but it fails to make the top ten for low-ability students (2.43, t = 2.700). Scholarship offers are less important to high-income students (2.63, N = 92) as compared to middle-income (2.03, t = 3.025, p < 0.01, N = 100) and low-income students (2.01, t = 2.735, p < 0.01, N = 72). The ease in obtaining financial aid/loans is more important to low-income students (2.33, t = 3.198, p < 0.01) and middle-income students (2.60, t = 2.104, p < 0.05) as compared with high-income students (3.03). There are no substantial differences in college choice factors when separating students by degree aspirations and whether they came from a small town (population less than 10,000).

**Results for Competing Institutions**

The ACT data file included a total of 6,718 high school graduates in 2001 who had UVSC in their choice set, with 1,491 (22 percent) ultimately attending the college. Students attended primary competing institutions as seen in Figure 1.

The addition of four-year degrees at the BYU Idaho campus could have a substantial impact on UVSC college enrollment in the future.

**Table 2: Important Choice Factors for UVSC Matriculants**

<table>
<thead>
<tr>
<th>Choice Factors</th>
<th>Within County</th>
<th>Outside County</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to live at home or commute daily</td>
<td>1.63</td>
<td>3.29</td>
<td>1.66*</td>
</tr>
<tr>
<td>Ability to work while attending school</td>
<td>1.74</td>
<td>2.12</td>
<td>0.38</td>
</tr>
<tr>
<td>Availability of your major/program of study</td>
<td>1.90</td>
<td>2.18</td>
<td>0.28</td>
</tr>
<tr>
<td>Cost of tuition</td>
<td>1.91</td>
<td>1.77</td>
<td>0.13</td>
</tr>
<tr>
<td>Prior credits taken awarded at the school</td>
<td>1.96</td>
<td>2.59</td>
<td>0.63*</td>
</tr>
<tr>
<td>Variety of course offering times (night, weekend, internet, etc.)</td>
<td>1.97</td>
<td>2.37</td>
<td>0.40</td>
</tr>
<tr>
<td>Quality of program in your intended major</td>
<td>2.21</td>
<td>2.29</td>
<td>0.08</td>
</tr>
<tr>
<td>Receiving a scholarship</td>
<td>2.22</td>
<td>2.20</td>
<td>-0.01</td>
</tr>
<tr>
<td>Safety</td>
<td>2.33</td>
<td>2.28</td>
<td>-0.05</td>
</tr>
<tr>
<td>Small class sizes</td>
<td>2.34</td>
<td>2.30</td>
<td>-0.04</td>
</tr>
<tr>
<td>Quality of faculty/faculty commitment to teaching</td>
<td>2.45</td>
<td>2.16</td>
<td>-0.29</td>
</tr>
<tr>
<td>Type of institution (private, public, 4-year, 2-year, etc.)</td>
<td>2.45</td>
<td>2.54</td>
<td>0.09</td>
</tr>
<tr>
<td>Ease in obtaining financial aid/loans</td>
<td>2.47</td>
<td>2.86</td>
<td>0.39</td>
</tr>
<tr>
<td>Admissions policy</td>
<td>2.52</td>
<td>2.55</td>
<td>0.03</td>
</tr>
<tr>
<td>Availability of graduate programs</td>
<td>2.65</td>
<td>2.66</td>
<td>0.01</td>
</tr>
<tr>
<td>Knew more about it than other schools</td>
<td>2.69</td>
<td>3.01</td>
<td>0.32</td>
</tr>
<tr>
<td>Overall reputation of the school</td>
<td>2.86</td>
<td>2.64</td>
<td>-0.22</td>
</tr>
<tr>
<td>Availability of special programs for academically talented students</td>
<td>2.89</td>
<td>2.97</td>
<td>0.08</td>
</tr>
<tr>
<td>Religious considerations</td>
<td>2.98</td>
<td>3.04</td>
<td>0.06</td>
</tr>
<tr>
<td>Friends attending school there</td>
<td>3.02</td>
<td>3.09</td>
<td>0.08</td>
</tr>
<tr>
<td>Attending a small school (&lt;4,000 students)</td>
<td>3.11</td>
<td>3.19</td>
<td>0.08</td>
</tr>
<tr>
<td>Work study or part-time employment opportunities at the school</td>
<td>3.15</td>
<td>3.35</td>
<td>0.21</td>
</tr>
<tr>
<td>School traditions, activities, or social scene</td>
<td>3.22</td>
<td>3.12</td>
<td>-0.10</td>
</tr>
<tr>
<td>Impressions from a campus visit or other personal contacts</td>
<td>3.28</td>
<td>3.12</td>
<td>-0.16</td>
</tr>
<tr>
<td>Athletic programs offered</td>
<td>3.36</td>
<td>3.47</td>
<td>0.12</td>
</tr>
<tr>
<td>Parent(s) felt it was the best choice</td>
<td>3.39</td>
<td>3.41</td>
<td>0.02</td>
</tr>
<tr>
<td>Other relatives attended school there</td>
<td>3.40</td>
<td>3.37</td>
<td>-0.03</td>
</tr>
<tr>
<td>Ability to commute home on weekends</td>
<td>3.54</td>
<td>2.23</td>
<td>-1.32*</td>
</tr>
<tr>
<td>Teacher or counselor recommended it</td>
<td>3.57</td>
<td>3.90</td>
<td>0.33</td>
</tr>
<tr>
<td>Availability of housing</td>
<td>3.64</td>
<td>2.44</td>
<td>-1.21*</td>
</tr>
<tr>
<td>Availability of sororities/fraternities, other clubs and organizations</td>
<td>3.74</td>
<td>3.91</td>
<td>0.17</td>
</tr>
<tr>
<td>Living away from home</td>
<td>3.88</td>
<td>2.45</td>
<td>-1.43*</td>
</tr>
<tr>
<td>Parents attended school there</td>
<td>4.20</td>
<td>4.68</td>
<td>0.48</td>
</tr>
<tr>
<td><strong>Sample Size</strong></td>
<td>129</td>
<td>148</td>
<td>—</td>
</tr>
</tbody>
</table>

*Significant p < 0.01, Scale: 1 = Very Important to 5 = Not Important

**Figure 1: Attendance at UVSC Compared to Primary Competing Institutions**
Table 3: Choice Factors—Students Attending Other Four-year Institutions

<table>
<thead>
<tr>
<th>Choice Factors</th>
<th>Average Ratinga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability of your major/program of study</td>
<td>1.72</td>
</tr>
<tr>
<td>Quality of program in your intended major</td>
<td>1.84</td>
</tr>
<tr>
<td>Type of institution (private, public, 4-year, 2-year, etc.)</td>
<td>1.88</td>
</tr>
<tr>
<td>Overall reputation of the school</td>
<td>2.01</td>
</tr>
<tr>
<td>Quality of faculty/faculty commitment to teaching</td>
<td>2.20</td>
</tr>
<tr>
<td>Receiving a scholarship</td>
<td>2.22</td>
</tr>
<tr>
<td>Safety</td>
<td>2.30</td>
</tr>
<tr>
<td>Cost of tuition</td>
<td>2.31</td>
</tr>
<tr>
<td>Ability to work while attending school</td>
<td>2.37</td>
</tr>
<tr>
<td>Religious considerations</td>
<td>2.46</td>
</tr>
<tr>
<td>Variety of course offering times (night, weekend, internet, etc.)</td>
<td>2.54</td>
</tr>
<tr>
<td>Knew more about it than other schools</td>
<td>2.58</td>
</tr>
<tr>
<td>Availability of housing</td>
<td>2.61</td>
</tr>
<tr>
<td>Ease in obtaining financial aid/loans</td>
<td>2.62</td>
</tr>
<tr>
<td>Impressions from a campus visit or other personal contacts</td>
<td>2.66</td>
</tr>
<tr>
<td>Prior credits taken awarded at the school</td>
<td>2.78</td>
</tr>
<tr>
<td>Availability of special programs for academically talented students</td>
<td>2.80</td>
</tr>
<tr>
<td>Living away from home</td>
<td>2.81</td>
</tr>
<tr>
<td>Admissions policy</td>
<td>2.82</td>
</tr>
<tr>
<td>Availability of graduate programs</td>
<td>2.82</td>
</tr>
<tr>
<td>Ability to commute home on weekends</td>
<td>2.88</td>
</tr>
<tr>
<td>Work study or part-time employment opportunities at the school</td>
<td>2.97</td>
</tr>
<tr>
<td>School traditions, activities, or social scene</td>
<td>2.99</td>
</tr>
<tr>
<td>Ability to live at home or commute daily</td>
<td>3.01</td>
</tr>
<tr>
<td>Small class sizes</td>
<td>3.15</td>
</tr>
<tr>
<td>Friends attending school there</td>
<td>3.28</td>
</tr>
<tr>
<td>Other relatives attended school there</td>
<td>3.32</td>
</tr>
<tr>
<td>Parent(s) felt it was the best choice</td>
<td>3.35</td>
</tr>
<tr>
<td>Teacher or counselor recommended it</td>
<td>3.61</td>
</tr>
<tr>
<td>Athletic programs offered</td>
<td>3.68</td>
</tr>
<tr>
<td>Attending a small school (&lt; 4,000 students)</td>
<td>3.94</td>
</tr>
<tr>
<td>Parents attended school there</td>
<td>3.95</td>
</tr>
<tr>
<td>Availability of sororities/fraternities or other clubs and organizations</td>
<td>4.14</td>
</tr>
</tbody>
</table>

Sample Size: 147

* Scale: 1 = Very Important to 5 = Not Important

Table 4: Importance of Information Sources (N = 483)

<table>
<thead>
<tr>
<th>Sources</th>
<th>Not Used</th>
<th>Percent</th>
<th>Average Ratinga</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web site</td>
<td>74</td>
<td>15.38%</td>
<td>2.41</td>
</tr>
<tr>
<td>Campus visit</td>
<td>116</td>
<td>24.07%</td>
<td>2.53</td>
</tr>
<tr>
<td>College catalogue or schedule</td>
<td>79</td>
<td>16.42%</td>
<td>2.60</td>
</tr>
<tr>
<td>Personal contact</td>
<td>162</td>
<td>33.68%</td>
<td>2.66</td>
</tr>
<tr>
<td>College guide books</td>
<td>134</td>
<td>27.86%</td>
<td>2.74</td>
</tr>
<tr>
<td>Direct mailings</td>
<td>64</td>
<td>13.25%</td>
<td>2.77</td>
</tr>
<tr>
<td>Visits to high schools</td>
<td>137</td>
<td>28.36%</td>
<td>2.83</td>
</tr>
<tr>
<td>Special event attendance</td>
<td>124</td>
<td>25.67%</td>
<td>2.93</td>
</tr>
<tr>
<td>Publications at high schools</td>
<td>109</td>
<td>22.57%</td>
<td>2.95</td>
</tr>
<tr>
<td>College night</td>
<td>219</td>
<td>45.63%</td>
<td>3.36</td>
</tr>
<tr>
<td>Advertisements in journals</td>
<td>227</td>
<td>47.10%</td>
<td>3.46</td>
</tr>
<tr>
<td>Radio, TV, newspaper</td>
<td>232</td>
<td>48.33%</td>
<td>3.58</td>
</tr>
</tbody>
</table>

*Scale: 1 = Very Important to 5 = Not Important

The enrollment patterns for several student subgroups at the institutions identified in Figure 1 (on the previous page) demonstrate that UVSC attracts a good share of students across various income groups, from rural versus urban areas, students of color, and students pursuing a wide variety of majors. However, UVSC is less successful in attracting high-ability students who are most likely to attend BYU. UVSC is also more likely to attract students working more hours while pursuing a college education. Analysis of the ACT data emphasized the possible benefits of using the data to recruit students desiring specific majors, minority students, or high-ability students, particularly among the substantial number of students (1,738, or 26 percent) who failed to attend any college. The ACT Profile also provided data on the four-year majors desired by prospective students that the college could offer in the future.

The choice factors important to non-matriculants at other four-year institutions provide additional insight for student recruitment. Measures of quality fail to make the top five for UVSC matriculants, and only one measure of quality reaches the top ten (Table 2). However, three measures of quality (quality of program in your intended major, overall reputation of the school, and quality of the faculty/faculty’s commitment to teaching) place in the top five for non-matriculants (Table 3). Thus, students attending elsewhere place a greater emphasis on quality rather than on location and cost issues.

Non-matriculants were asked what UVSC could do to encourage them to attend or improve. The most common responses are categorized as follows (in rank order): offer more scholarships, increase mailings (shows interest and provides needed information), improve the academic reputation of UVSC, offer a wider variety of majors, visit more high schools, and offer more four-year degrees.

Student Sources of Information

Study results point out that the Web site is one of the most influential sources of information for prospective students, followed by a campus visit (Table 4). The least influential sources of information are advertisements in journals, newspapers, radio, or television.

Conclusion

This research emphasizes the need to consider additional choice factors and improve available standardized instruments. In addition to identifying important choice factors from a review of the literature, the current study finds that flexibility in course offering times or delivery methods (night, weekend, Internet etc.) affects student college choice. The literature review did not result in any other studies considering this factor. Other contributions of this study include the finding that campus safety is an influential consideration, particularly for females. High school concurrent enrollment credit also appears to encourage selection of the institution.

The relevance of academic reputation, quality of faculty and instruction, location, costs, scholarship offers, financial aid, and student employment opportunities confirms findings in several studies cited in the literature. The relative importance of various student sources of information adds to prior research, confirm-
ing the findings of Seymour (2000) that the Web has become an important marketing tool for institutions.

The marketing framework was also found to have utility in analyzing the college choice decisions of prospective students. Major competitors were identified along with the need to improve the academic reputation of the college, add specific majors, and increase scholarship offers to attract more students choosing to attend other institutions. Other institutions can successfully use this framework to understand their student markets.

References


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- Jobs Online
- FERPA Online Guide
- Transfer Credit Practices Online
- Resource Center
- Publications Library
- Virtual Member Guide
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How Well Does the GRE Work for Your University? An Empirical Institutional Case Study of the Graduate Record Examination Across Multiple Disciplines

Abstract

This case study was designed to demonstrate how an institution could use readily available archival data to produce a simple, yet informative validity study as a necessary step in understanding the effectiveness of the selection process. Results indicated the GRE does not significantly predict graduate school success across all disciplines tested, but demonstrates some utility for specific disciplines. Additionally, prior undergraduate GPA was the best predictor of future CGPA. Implications and limitations are discussed.

There is an increasing demand in the job market for individuals holding graduate degrees. Subsequently, the number of students entering graduate school and receiving graduate degrees is the highest it has ever been in the United States (Henderson, Clarke, and Reynolds 1996). Indeed, graduate training is critical for most professional fields and can have a significant impact on one’s career as related to income, promotion, and status. This heightened demand for access to graduate school has produced an increased interest in the selection criteria employed by universities. Thus, it is likely that the microscope of public opinion will scrutinize universities regarding admissions practices. As several recent exposés in popular news magazines might suggest (e.g., Kantrowitz and Wingert 2003), administrators would be well advised to study their admissions practices carefully and understand the full range of their selection criteria.

Beyond public feelings about university admission systems, inadequate selection systems are likely to do a great disservice to both the university and student. Poor decisions can result in inefficient uses of resources for the university, lost time and financial burdens for the student, and an overall weakening of the particular profession. Thus, developing a selection system that is both valid and administratively feasible presents a real challenge. As with most selection decisions, decisionmakers are drawn to objective predictors of success that are easily comparable and quickly diminish the applicant pool. The Graduate Record Examination (GRE) has been the objective predictor of choice for the past 50 years.

The majority of universities in the United States require applicants to take at least the general GRE test for admission into graduate programs in the Humanities, Sciences, Social Sciences and Arts (e.g., Norcross, Hanych and Terranova 1996). Most institutions utilize the GRE in a “top-down” selection approach employing minimum standards (cut-offs) for consideration (Oltman and Hartnett 1984, 1985). Moreover, the GRE tends to be the most heavily weighted criterion used by selection committees (Chernyshenko and Ones 1999; Ingram 1983).

However, Educational Testing Service (ETS), the developer and publisher of the GRE, does not endorse this practice. On the contrary, ETS’s Guide to the Use of Scores (1997) explicitly rejects the practice, commenting, “A cut-off score below which every applicant is categorically rejected without consideration of any other information should not be used” (p. 9). Additionally, ETS recommends that using an overall GRE composite score as a predictor is inappropriate unless the institution demonstrates predictive validity evidence. Despite these clear recommendations, universities continue to utilize both GRE cutoffs and composite...
scores as the primary criteria for selection (Chernyshenko and Ones 1999; Rem, Oren and Childrey 1987). Universities may be using the test inappropriately; however, a more fundamental issue remains for most universities regarding the overall utility of the GRE’s prediction of graduate school success at the local level. Although large reviews (e.g., Kuncel, Hezlett and Ones 2001) show the GRE to be predictive of graduate school success, these data are aggregated and cannot inform administrators about the GRE and their own institution.

A Case Study
A growing need then exists for institutions to conduct a local, comprehensive review of the GRE. In the present case study, we discuss our attempt to conduct such a review at a large Midwestern private university. As with most graduate schools, the university graduate school represents diverse disciplines and degrees. Although the selection process for each discipline varies considerably, the GRE is used across the board as a standardized predictor and is required for admission. Like many universities, this university has never completed a comprehensive (i.e., across all disciplines) criterion-related validity study to demonstrate the usefulness of the GRE. With that in mind, the purpose of the present case study is three-fold:

- To attempt to understand the utility of the GRE across multiple disciplines;
- To demonstrate how a simple validity study using institutional data archives can yield powerful information for decisionmakers; and
- To add to the growing academic literature regarding the usefulness of the GRE in predicting graduate school success.

The relevant literature regarding the GRE and typical measures of graduate school success are reviewed below. The authors, however, do not attempt to summarize all the potential predictors of student success (e.g., Wolfe and Johnson 1993), describe barriers to student success (e.g., Tisue and Whitaker 1999), or demonstrate how the GRE might be used as a measure of learning or in conjunction with other outcome variables (e.g., Guadalupe 1999). Rather, there is a focus on variables graduate schools readily collect during the admissions process and throughout students’ graduate careers that would allow for accessible data analysis in completing a review of this nature.

GRE and Graduate School Grades
The GRE was primarily developed to predict academic success in graduate school through the demonstration of basic learned abilities such as verbal and quantitative skills. Thus, the verbal (GRE-V), quantitative (GRE-Q) and analytical (GRE-A) subtests are intended to measure abilities necessary for achieving academic success often measured in terms of the first-year graduate grade point average (GGPA). A number of meta-analyses have attempted to address this relationship and found moderately poor relationships between the GRE and grades (e.g., Morrison and Morrison 1993). However, Kuncel, Hezlett and Ones (2001) completed a large meta-analysis of 1,753 independent samples that showed GRE-V, GRE-Q and GRE-A were all significant (corrected coefficients ranged from 0.24 to 0.47) predictors of both first-year GGPA and graduating GGPA. Across most studies, the literature suggests that the GRE subtest seems to adequately predict first-year GGPA.

Validity Across Academic Disciplines
Mixed results exist for specific fields of study and GRE validity. For example, Thornell and McCoy (1983) used scores on GRE-V, GRE-Q and GRE-TOTAL (GRE-T) from Education, Humanities, Fine Arts, and Mathematics/Science to predict GGPA. Findings revealed significant validity coefficients ranging from 0.36 in Fine Arts to 0.48 in Mathematics/Science for GRE-T. Kuncel, Hezlett, and Ones (2001) showed that the GRE was a significant predictor of GGPA across similar broad discipline categories such as Humanities, Social Science, Life Science, and Math-Physical Science. Using a sample of psychology students, Sternberg and Williams (1997) found low correlations between first-year GGPA and GRE-V (r = 0.18, p < 0.05), GRE-Q (r = 0.14 ns) and GRE-A (r = .17, p < .05) and no relationship between GRE and secondyear GGPA. Although the Sternberg and Williams study has received some criticism, other studies revealed similar findings in the disciplines of psychology (House and Johnson 1998; Ingram 1983), education (Kluever and Green 1992) and public administration (Oldfield and Hutchinson 1997). Taken together, the GRE seems to yield acceptable validity when aggregated across broad disciplinary categories, and slightly less than acceptable predicative validity within specific disciplines.

Beyond GGPA, a limited number of studies have examined the relationship between the GRE and other criterion measures including degree completion and undergraduate academic record. For instance, House and Johnson (1993) combined GRE scores with undergraduate GPA (UGPA) and undergraduate GPA for the last 60 credit hours taken (Last 60) in a stepwise logistic regression. The regression failed to significantly predict degree completion. Schneider and Briel (1990) produced a comprehensive validity report in conjunction with the GRE Validity Study Service and found slightly stronger effects. Size adjusted correlations for UGPA and Last 60 credits were 0.33 and 0.32 respectively. Kuncel, Hezlett, and Ones (2001) found that the GRE was predictive of comprehensive exam scores, publication citation counts, and faculty ratings but generally not predictive of research productivity, time to completion, and degree attainment.

Finally, recent research suggests the GRE may be gender, race, and age specific. House (1997) found that for American Indian/Alaska Native students GRE-V, GRE-Q, and GRE-T (GRE total score) were not significant predictors of GGPA; however, significant correlations were found between GRE-Q (r = 0.47, p < 0.05), GRE-T (r = 0.40, p < 0.05), and degree completion. Examining race and gender, Hughey (1995) found that mean scores for men were higher on all GRE scores; however, these differences were not significant. Additionally, findings indicate that the correlation between undergraduate grade point average (UGPA) and scores for White men and women combined were significant; however, the coefficients for African American men and women were non-significant. With respect to age, House (1989) found that GRE scores tended to over-predict the GGPA of younger students (24 years and younger) and under-predict (25 years and older) the GGPA of older students.
By and large, the research reviewed above demonstrates that the GRE is a moderately strong predictor of graduate school success. As Kuncel, Hezlett, and Ones (2001) remarked, “…we found no evidence to support the position that admission decisions that rely on the GRE or UGPA will result in inferior and limited graduate success” (p. 177). Despite the glowing review, the authors believe, as does ETS, that understanding the utility of the GRE at the institutional level is informative and critical. More importantly, we hope to provide a rather simple methodology for other institutions that become compelled to examine the GRE. To do so, this study examined the GRE’s contribution in predicting graduate school success, as measured by students’ GPAs after the first year and at graduation, while controlling for demographic characteristics (i.e., age, race, and gender) and incoming GPA (undergraduate or master’s).

**Method**

**Participants**

Participants were recruited for the study by retrieving graduate student records over the past five years from a large private Midwestern university’s database. Only those students who had been enrolled in the university for a minimum of two years were eligible for the study. The number of students meeting these criteria totaled 2,192. Most students were female (65 percent) and White (80 percent). (See Table 1). The average age of the students was 31 years (sd = 9.08; median = 28) however, age ranged from 20 to 65 years.

As seen in Table 1, students entered the university with a high mean UGPA (3.45) and GRE scores (GRE-V mean = 485; GRE-Q mean = 515; GRE-A mean = 532). Their academic performance continued to be superior, as the average first-year GPA was 3.65 and their graduating GPA was even higher (mean = 3.71). Sixty percent of the students were working towards a master’s degree, 30 percent towards a doctorate, and 10 percent were undecided. A variety of majors were represented. Education and Nursing were the two largest majors, comprising 30 percent of the students registered in these programs. Community Mental Health, Health Administration, and Psychology were the next largest majors, encompassing 17 percent of the students.

**Procedure**

University records on every student were kept in an active database. As previously stated, participants were recruited by retrieving students’ records who had enrolled in the university over the past five years; however, every student needed to be enrolled for at least two years to participate in the study. Without this criterion, insufficient information would be recorded on the student to aid in analyses. Information such UGPA, current GPA, major, and GRE scores were downloaded from the database. Other demographic variables were also downloaded, including race, gender, and age.

Many students were missing data on undergraduate GPA. In this case, the original students’ records (i.e., submitted during the application process) were consulted and when possible, recorded from transcripts. In those cases where the student entered the university with a master’s degree, the master’s degree GPA was recorded.

The decision to admit the student is often based on the most recent GPA; using the master’s GPA is consistent with this practice.

**Analyses**

Several analyses were run to determine how well GRE scores predict graduate school success. First, correlation coefficients were calculated between first-year GPA and graduating GPA with GRE-Q, GRE-V, and GRE-A. Second, two multiple regression models were tested. Graduate school success was measured in two different ways. The students’ GPA was used at two different points in their academic career, the first-year GPA and graduating GPA. The first-year GPA was assessed one year from the term they entered the university, regardless of whether they were enrolled for two terms. This enabled the measure of first-year GPA to be consistent for every participant. In order to estimate the regressions, two variables had to be dummy coded. That is, degree sought and race had to be dichotomized. Degree sought was categorized as master’s or doctoral. Race was recoded into two variables, White or other and African American or other.

The independent variables used to predict graduate school success were consistent across both regression models. The equation for the regression is as follows:

<table>
<thead>
<tr>
<th>Table 1: Demographic Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Race</td>
</tr>
<tr>
<td>White</td>
</tr>
<tr>
<td>Black</td>
</tr>
<tr>
<td>Asian</td>
</tr>
<tr>
<td>Hispanic</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td>Age in Years</td>
</tr>
<tr>
<td>Prior GPA</td>
</tr>
<tr>
<td>GRE Scores</td>
</tr>
<tr>
<td>Verbal</td>
</tr>
<tr>
<td>Quantitative</td>
</tr>
<tr>
<td>Analytic</td>
</tr>
<tr>
<td>First-year GPA</td>
</tr>
<tr>
<td>Graduated GPA</td>
</tr>
<tr>
<td>Years to Graduate</td>
</tr>
<tr>
<td>Master’s</td>
</tr>
<tr>
<td>Doctorate</td>
</tr>
<tr>
<td>Degree pursued</td>
</tr>
<tr>
<td>Master’s</td>
</tr>
<tr>
<td>Doctorate</td>
</tr>
<tr>
<td>Undecided</td>
</tr>
<tr>
<td>Major</td>
</tr>
<tr>
<td>Community MH</td>
</tr>
<tr>
<td>Education</td>
</tr>
<tr>
<td>Health Admin.</td>
</tr>
<tr>
<td>Nursing</td>
</tr>
<tr>
<td>Psychology</td>
</tr>
<tr>
<td>Undecided</td>
</tr>
</tbody>
</table>
Graduate School Success =
GRE scores + Degree sought (master’s or doctoral) +
entering GPA (undergraduate or master’s) + age + gender +
White + African American

The regression models were tested for different majors to
determine whether the prediction of the GRE varied by the type
of major sought. Although several majors were recorded in the
database, not all majors had a sufficient number of students to
test the models. Only those five majors listed in the table had at
least 100 students with which to test the models.

Results

Correlations

Several bivariate correlations were calculated between the GRE
scores, GPA, and demographic characteristics. As seen in Table
2, all of the correlations are significant. However, the magni-
tudes of the correlations are not strong. For example, the corre-
lations between GRE scores and graduating school success range
from 0.07 to 0.24. According to Nunnally and Bernstein (1994),
a correlation of at least 0.30 is required for predictive validity.
None of the correlations meet that requirement. Interestingly,
the GRE scores are more strongly correlated with the demo-
graphic characteristics.

Regressions

Two regression models were tested across all disciplines to
examine how well GRE scores predict graduate school success.
The GRE scores are not significantly related to the two measures
of graduate school success in the regression models, while con-
trolling for extraneous factors. However, when analyzed by
majors, significant relationships do emerge.

Across Disciplines. The first regression model tested for how
well the GRE scores predicted graduating school success, as mea-
sured by the first-year GPA. Explaining 21 percent of the vari-
ance in first-year GPA, the overall model was significant
\( F(9,1310) = 38.39; \ p < .001 \). (See Table 3). However, only two
variables significantly predicted first-year GPA: degree pursued,
and incoming GPA. Those students seeking a doctoral degree had
a higher first-year GPA than students seeking a master’s degree.
As expected, those students who entered the university with a
higher GPA also had a higher first-year GPA. The three GRE
scores (GRE-V, GRE-Q, and GRE-A) did not predict GPA for
students in their first year.

The second regression model included the same independent
variables, but students’ graduating GPA measured graduate
school success. The overall model explained a significant amount
of the variance (35 percent) in GPA at graduation \( F(9,616) = 36.63; \ p < .001 \). (See Table 3). Five variables were significantly related
to the graduating GPA: degree pursued, prior GPA, gender, White,
and African American. As in the previous model, degree pur-
sued and prior GPA had a positive relationship with graduating
GPA. Gender was significantly related to graduating GPA with
females graduating with a higher GPA than males. Race was also
significantly related to graduating GPA, where Whites obtained
a higher GPA and African Americans achieved a lower GPA.

By Disciplines. Separate regression models were tested for
each of the five disciplines mentioned in Table 1. For graduate
school success as measured by first-year GPA, GRE-A was a sig-
nificant predictor for Education and Psychology majors as can be
seen in Table 4. GRE-Q and GRE-A significantly predicted first-
year GPA for Nursing majors. None of the GRE scores were sig-
nificantly related to first-year GPA for Community Health or
Health Administration majors. Interestingly, when all of the
remaining majors were combined, GRE-V was a significant pre-
dictor of first-year GPA.

The second group of models used graduating GPA as a measure of
success. Only Community Health and Nursing have GRE scores
that significantly predicted graduating GPA. For Community
Health majors, GRE-V was a significant predictor. GRE-Q was
significantly related to graduating GPA for nursing majors.

<table>
<thead>
<tr>
<th>Variables</th>
<th>GRE-V</th>
<th>GRE-Q</th>
<th>GRE-A</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>coeff</td>
<td>N</td>
<td>Coeff</td>
</tr>
<tr>
<td>Graduating GPA</td>
<td>744</td>
<td>0.21</td>
<td>744</td>
</tr>
<tr>
<td>First-Year GPA</td>
<td>1820</td>
<td>0.24</td>
<td>1821</td>
</tr>
<tr>
<td>Incoming GPA</td>
<td>1628</td>
<td>0.26</td>
<td>1630</td>
</tr>
<tr>
<td>Age</td>
<td>2083</td>
<td>0.09</td>
<td>2085</td>
</tr>
<tr>
<td>Gender (^1)</td>
<td>2083</td>
<td>-0.15</td>
<td>2085</td>
</tr>
<tr>
<td>Race (^2)</td>
<td>2083</td>
<td>0.34</td>
<td>2085</td>
</tr>
</tbody>
</table>

Table 2: Correlation Coefficients

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>First-Year GPA</th>
<th>Graduating GPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta (^1)</td>
<td>t stat</td>
<td>Beta (^1)</td>
</tr>
<tr>
<td>GRE-V</td>
<td>.0002</td>
<td>1.83</td>
</tr>
<tr>
<td>GRE-Q</td>
<td>.0001</td>
<td>1.22</td>
</tr>
<tr>
<td>GRE-A</td>
<td>.0002</td>
<td>1.34</td>
</tr>
<tr>
<td>Degree Pursued</td>
<td>.0870</td>
<td>4.06 (^c)</td>
</tr>
<tr>
<td>Prior GPA</td>
<td>.2780</td>
<td>12.46 (^c)</td>
</tr>
<tr>
<td>Age</td>
<td>.0020</td>
<td>1.58</td>
</tr>
<tr>
<td>Gender</td>
<td>.0360</td>
<td>1.80</td>
</tr>
<tr>
<td>White</td>
<td>.0160</td>
<td>0.53</td>
</tr>
<tr>
<td>Non-White</td>
<td>-.0850</td>
<td>-1.92</td>
</tr>
</tbody>
</table>

\(^1\) Unstandardized beta estimates are reported in order to compare the estimates across models
\(^2\) p < .05
\(^c\) p < .01
\(^*\) p < .001

By Disciplines. Separate regression models were tested for
each of the five disciplines mentioned in Table 1. For graduate
school success as measured by first-year GPA, GRE-A was a sig-
nificant predictor for Education and Psychology majors as can be
seen in Table 4. GRE-Q and GRE-A significantly predicted first-
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success. Only Community Health and Nursing have GRE scores
that significantly predicted graduating GPA. For Community
Health majors, GRE-V was a significant predictor. GRE-Q was
significantly related to graduating GPA for nursing majors.
Discussion

The present case study was designed to more fully understand how the GRE might impact entrance and success in graduate programs at a Midwestern university. In general, GRE scores were not highly significant predictors of graduate school success as measured by the criteria employed. As mentioned before, the GRE is designed to measure academic success in the form of predicting first-year graduate grades. At this university, none of the subtests significantly predicted first-year graduate GPA. This is surprising given the strength of the Kuncel, Hezlett, and Ones (2001) findings. However, compared to the uncorrected correlation coefficients found in Kuncel, Hezlett, and Ones, the present study coefficients are of a much smaller magnitude.

As seen in Table 3, the strongest predictor of graduate school success was students’ prior GPA, followed by degree pursued. Grades are often a reflection of other abilities beyond general mental abilities (e.g., motivation, opportunity) and tend to be stable over time. Thus, it is not surprising that prior undergraduate GPA is a strong predictor of students’ graduate GPA, both in their first year and at graduation. This gives credence to the theory that one of the best predictors of future behavior is past behavior.

When the sample is separated by disciplines, some interesting findings emerged. Clearly, the GRE is not universally predictive and by breaking out the sample, the authors were able to obtain a more complete picture of the GRE’s usefulness. Although these findings do not overwhelmingly support the use of GRE at this university, they do suggest that the test has some utility for specific disciplines. Before making such a decision, more research is necessary, especially with disciplines not represented in the present study. Unfortunately, due to limited sample size in certain disciplines, not all disciplines could be examined.

Implications

The data suggest that the only way to truly understand the GRE’s utility for a single university is to conduct an institution validity study that allows for comparison and evaluation across disciplines. Although national norms and even aggregated university data may reveal some important information, a discipline-specific study provides administrators with rich information not available from ETS or the current academic literature. For instance, our institutional data only partly reflect the overall positive findings of the large Kuncel, Hezlett, and Ones (2001) meta-analysis. Thus, published research is a necessary but insufficient source of information in understanding the usefulness of the GRE to any given institution.

Conducting a validity study at the institution level also allows administrators to select important moderators to examine (e.g., age, race, prior GPA) that might increase the accuracy of decision-making (e.g., including prior GPA in a regression equation) or allow for increased sensitivity to the impact of the GRE on minority and non-traditional students’ candidacy. Further, examining these data can greatly add to an institution’s ability to streamline its admissions process and yield the most “bang for the buck.” For instance, departmental administrators in disciplines where the GRE seems to lack predictability of graduate student success might choose to utilize (or weight more heavily) a discipline specific predictor (e.g., GRE Subject Tests) or combination of predictors in place of the GRE general test.
Clearly, objective predictors such as the GRE provide fast and comparable data that aid greatly in decision-making. Our data do not suggest, nor are we advocating for (see limitations below), the disposal of such objective measures. In fact, research suggests that even small differences in predictive validity can have great utility over time (Boudreau 1991). Thus, in the long run, studying the impact of the GRE usefulness should improve selection decisions. Suffice it to say, the authors hope the present study highlights the importance of understanding the nature of the GRE’s role in predicting success.

Given the discussion, it is important to note that validity studies of the GRE present major psychometric challenges, and that this study is no exception. Students in the present sample were ones who had been accepted and enrolled in courses. This creates range restriction and generally attenuates the reported correlations on two fronts: the lack of variability in grades (i.e., most students receive an A or B in graduate courses) and lack of variability in GRE scores due primarily to the use of minimum cutoff scores. Unfortunately, our data archives did not collect selection ratios that would allow us to estimate the means and standard deviations of those students who applied but did not enroll. Thus, although some of the results may seem quite marginal, it is likely that without such range restrictions, the magnitude of the relationships would be substantially larger (see Chernyshenko and Ones 1999, for a full discussion of the GRE and range restriction).

In addition, predictor-relationship criteria are likely to be underestimated due to unreliability in both the predictor and criterion. Much of this can be attributed to the well-known “criterion problem,” which refers to the difficulty in fully defining graduate school success. Thus, the present study’s use of GPA may be extremely “noisy” with respect to its psychometric properties. In addition, using grades as a measure of success implies that success in graduate school is based solely on academic achievement. Undoubtedly, classroom ability is only one component of graduate school success and other abilities (e.g., social skills, research creativity, and tenacity) are equally, if not more important.

This study possessed a number of strengths that can serve to heighten the awareness of administrators and institutional researchers alike. Specifically, the authors attempted to demonstrate how universities could harness existing databases to examine the role of standardized tests in selection and retention policies/programs across multiple disciplines. In addition, intervening variables (e.g., race, gender etc.) were included and clearly impact results, but have not been well accounted for in other studies (Oldfield and Hutchinson 1997).

The present results suggest that given the array of objective predictors, the GRE should not be discarded but rather studied carefully to ascertain its utility at the university level. Further, university administrators should not assume (or take on faith) that the GRE is equally predictive across all graduate disciplines. For example, the present study served to prompt and frame future institutional research questions for this university’s administration. Thus, the authors echo ETS (2000) in stating the value of conducting a validity study to understand and optimize the benefits of the GRE for specific disciplines. For many universities like this one, a simple study of the GRE, regardless of the results, can be an important first step toward making informed selection decisions.

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Diane Lampe, Associate Vice President Student Services and Academic Advising
Many Americans have looked to higher education to provide a bridge to economic and social equity for this country’s citizens who are lacking in these areas (Bowen and Bok 1998; Minnesota Private College Research Foundation 1994). This expectation is especially significant to ethnic minorities who traditionally have been under-represented in higher education, including African Americans, Hispanics, and Native Americans (Pavel 1999; Thomas 1998). At the present time, a dramatic shift is occurring in the nation’s demographics among the college-age population. The number of minorities in this age group is increasing while the overall college-age population is decreasing. Consequently, it seems that such shifts would be advantageous to college-age minorities in achieving some degree of equity in this area (Horn and Maw 1995).

The United States Department of Labor estimations of the year 2010 predict that 42 percent of the available job openings would require at least four years or more of college (U.S. Department of Labor 2000). However, historically, these three aforementioned under-represented minorities are less likely than their White and Asian American peers to pursue higher education (Thomas 1998). Even though college attendance within these under-represented groups shows increases (NCES 1996), the numbers seem to disproportionately lean toward two-year institutions as opposed to four-year institutions (Karen 1991). Thus, many of these groups continue to experience lower social status and economic prosperity (Horn and Maw 1995).

The limited pool of qualified minorities is also going to be evident among higher education faculty, where as recently as 1994, minorities constituted only 12 percent of higher education’s full-time instructional faculty while representing 26 percent of the United States’ population (Compact for Faculty Diversity 1994). The lack of minority faculty will present additional problems to ethnic minorities pursuing higher education, because there will be a lack of minorities who would possibly serve as mentors, promote and encourage success in minority students, and provide a knowledge and research base on minority issues in higher education (Ibarra 1996; Seymour and Hewitt 1994). These are all critical issues, which if not addressed, will be detrimental to the success of many minority students including those who will enroll in graduate and professional programs upon the completion of an undergraduate degree.

It is important that institutions of higher education address the under-representation of minorities in various undergraduate programs because ethnic minorities make up almost one-third of American residents (The Chronicle of Higher Education Almanac 2000). One way to address this problem is to more accurately develop recruitment strategies for high school students in these ethnic minority groups. This study will be important in providing a picture of the most influential social and economic factors that were significant to minority students in their decision to attend college.

Background

Hossler and Gallagher (1987) stated that there are three phases of the college choice process for students considering college—predisposition, search, and selection. During the first stage, predisposition, students decide whether they will attend college, which is determined usually by background and attitudinal characteristics. Once the student decides to pursue postsecondary education, the student enters the search phase, which has
been identified as the period during which the student actually begins to seek information about higher education institutions. The final stage of the college choice process, selection, entails the student actually making a final decision on the institution that he/she would like to attend (Hossler and Gallagher 1987). This study focuses on the first stage and concentrates primarily on the personal, social, and economic factors that influence a student’s decision to attend college.

Many have postulated that during this decision-making process, economic and financial issues most influence the predisposition stage (Astin 1985; Canale et al., 1996; McDonough and Antonio 1996; Tierney 1980). Students who are considering college have to determine, in many cases, whether they can attend college based upon their family’s support. The conclusion is that many students from minority backgrounds tend to avoid college due to the concern that they may incur financial hardships upon their family (Canale et al. 1996; Sevier 1992). Additionally, the level of knowledge and understanding of federal financial aid opportunities impacts many students’ decision to attend college. For those students from economically deprived backgrounds, this impact is disproportionately negative (Gibbs 1995). Finally, the perceived benefit of attending college to enhance potential workforce earnings upon graduation from the institution is also an influential economic factor for many students (Wenglinsky 1996).

Social and personal factors also have been identified as factors critical to a student’s decision to attend college (Abraham and Jacobs 1990; Cabrera, Nora, Terenzini, Pascarella, and Hagedorn 1999; Gilmour, Spiro, and Dolich 1981; Horvat 1996; Martin and Dixon 1991; Smith and Matthews 1992). These studies focus on the role that campus climate (Cabrera, Nora, Terenzini, Pascarella, and Hagedorn 1999), counselors and peers (Abraham and Jacobs 1990; Hossler, Schmit, and Vesper 1999), and parental and other family members (Gilmour, Spiro, and Dolich 1981; Horvat 1996; Smith and Matthews 1992) have on the potential college student’s decision-making process. These factors individually or in various combinations impact college choice during the predisposition stage.

Hossler, Schmit, and Vesper (1999) stated that parents are the most influential in this decision-making process. Their research stated that in the three-stage college choice process (Hossler and Gallagher 1987), there is a three-stage parental influence model as well. This model consists of parents providing general information about college (proximity, price, etc.), encouragement, and finally college visits and applications. However, this model does not take into consideration the impact of other individuals, or entities, in the lives of these potential college students, particularly those who are first-generation students.

There have been various other studies that have analyzed college choice influences (Discenza et al. 1985; Gilmour, Spiro, and Dolich 1981). Dixon and Martin (1991) stated that most of these psychometric approaches were not sufficient in truly understanding college choice influences. Their College Choice Influences Scale (Dixon and Martin 1991), which focused on influences at all three levels of Hossler and Gallagher’s (1987) model of college choice, was developed to achieve that goal, but it too seems to lack a true approach to measuring the predisposition stage. This instrument and its findings emphasize the role of parental, other family members, and peer influence on college choice.

This study will examine, more specifically, familial, high school personnel, college representatives, and other social/civic interactions that may contribute to student choice to attend college. These influences, which are promoted by these groups through encouragement, general college promotion, as well as economic support, are measured in an instrument specifically designed to determine various aspects of college choice. More specifically, this study will answer the following research questions:

- What factors were most important in student choice to attend college?
- Is there a difference in these factors of college choice based upon ethnic/racial identification?

### Methodology

The instrument for this study was developed based upon literature related to college choice (Abraham and Jacobs 1990; Cabrera, Nora, Terenzini, Pascarella, and Hagedorn 1999; Dixon and Martin 1991; Gilmour, Spiro, and Dolich 1981; Horvat 1996; Hossler and Gallagher 1987; Martin and Dixon 1991; Smith and Matthews 1992). Upon the completion of the instrument, experts in the field were consulted to assure content validity. These experts included a high school counselor, a faculty member whose research specializes in college student issues, a college admissions counselor, and an associate dean for a college of education. After explaining the research and reviewing the original list of factors related to college choice during the predisposition stage, the experts eliminated some items due to duplication and relevance to the study, and finally, made suggestions related to wording of the remaining items. The final scale consisted of 11 demographic questions and 28 items related specifically to college choice. The latter items were to be responded to based upon a Likert scale, which ranged from 1-Not Important to 5-Very Important, with 3 being neutral.

The 28 items represented 6 subscales, which included factors that influence college choice such as family, peers, civic personnel, college personnel, and possible economic gain. Each of these subscales yielded reliabilities ranging from 0.723 to 0.952, with the overall scale yielding a total reliability of 0.89.

Upon gaining approval to conduct the study through the campus institutional review board at a large research institution in the Midwest, the researchers distributed the survey to students who participated in various student activities at the institution. The instrument was distributed to 219 students, with 61 percent of these respondents being female. Based upon classification, 38 percent ($n=83$) of the respondents were seniors, 20 percent ($n=44$) were juniors, 20 percent ($n=44$) were sophomores, and 15 percent ($n=33$) were freshmen. In terms of ethnic representation, 37.4 percent ($n=82$) were African American, 5 percent ($n=11$) were Asian/Pacific Islander, 38.3 percent ($n=84$) were Caucasian, 5 percent ($n=11$) were Hispanic, 6 percent ($n=14$) were Native American, and finally 8 percent ($n=17$) were in an “other” category, which includes students who identified themselves as multiethnic and international students.

General descriptive statistics were analyzed to rank the responses based upon the means for each of these ethnic groups’ responses. Then, an analysis of variance (ANOVA) of the items was conducted to determine if significant differences existed.
within this individual characteristic, ethnic identification. A Tukey post hoc test was conducted to determine where the differences existed among the ethnic groups.

Findings

MOST IMPORTANT FACTORS IN COLLEGE STUDENT ATTENDANCE

The responses of the participants' perceptions overall are displayed in Table 1. Even though each of the items was rated individually, the participants consistently rated the items related to achieving personal and career goals highest. There were four items in this category, and they all appeared in the top five of overall responses. Items from categories related to family/friends and high school personnel/support also were in the top ten list of factors that influenced participants' decision to attend college. There were three items related to family/friends, and there were two items related to high school personnel/support in the top ten. The last item in the top ten related to college-related efforts (field trips to college campuses).

Tables 2a and 2b (on the following pages) provide a synopsis of the means of each of the items on the survey based upon the race of the respondent. Even though there were some differences in the order of the top five, there was no difference in the top five items based upon race. Additionally, these top five items were consistent with the top five in the overall ratings of respondents in Table 1.

Table 1: Overall Highest Ratings For Factors Influencing College Attendance Decision (Top 5 For All Students)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possibility of achieving a personal career goal</td>
<td>4.87</td>
</tr>
<tr>
<td>upon the completion of college</td>
<td></td>
</tr>
<tr>
<td>To earn a college degree is a personal goal</td>
<td>4.82</td>
</tr>
<tr>
<td>Possibility of getting a better job upon</td>
<td>4.80</td>
</tr>
<tr>
<td>the completion of college</td>
<td></td>
</tr>
<tr>
<td>Possibility of making more money upon the</td>
<td>4.77</td>
</tr>
<tr>
<td>completion of college</td>
<td></td>
</tr>
<tr>
<td>Parents' encouragement to attend</td>
<td>4.31</td>
</tr>
<tr>
<td>Being enrolled in a high school program</td>
<td>3.82</td>
</tr>
<tr>
<td>that prepared me for college</td>
<td></td>
</tr>
<tr>
<td>Teachers' support and encouragement</td>
<td>3.75</td>
</tr>
<tr>
<td>Parents' willingness to provide financing</td>
<td>3.57</td>
</tr>
<tr>
<td>Field trips to college campuses</td>
<td>3.42</td>
</tr>
<tr>
<td>Encouragement by friends who are attending/</td>
<td>3.42</td>
</tr>
<tr>
<td>have attended college</td>
<td></td>
</tr>
</tbody>
</table>

DIFFERENCES IN RESPONSES BASED UPON RACE

The ANOVA yielded fifteen significant differences in eleven of the items based on ethnic groupings. These eleven items were within four of the six subscales. These items related to college choice based on information, financial support, and encouragement received from various individuals and entities.

The first categorical subscale in which a significant difference occurred was related to the efforts of college admission offices. African Americans (M=3.40) responded significantly higher than Caucasian respondents (M=2.78) that admissions representatives providing them with college information had an impact on their decision to attend college. Additionally in this subscale, as compared to Caucasian respondents (M=2.52), Hispanic (M=1.73) and African American (M=3.10) respondents stated that advertisements by colleges in their school or community were more influential in their decision to attend college. Finally, there was a significant difference between African American (M=1.43) and Caucasian respondents (M=2.63) based on their response to the role that college recruiters had in providing them with information about college.

Also within this subscale, significant differences were found related to scholarship support for extracurricular activities. African American respondents (M=2.18) rated the item related to the opportunity to participate in college athletics due to a scholarship more positively than did Caucasian respondents (M=1.60). Also, African American respondents (M=2.93) and respondents who identified themselves as an ethnicity other than those listed (M=3.41) were slightly more positive than Caucasian students (M=2.15) in relation to the opportunity to participate in other extracurricular activities due to a scholarship.

The next subscale in which significant differences were found related to the influence of church and religion on student college choice. African American students (M=3.10) were significantly more positive in their response to the statement that the encouragement they received from members of church- and religious-based organizations was more influential in their decision to attend college than Caucasian students (M=2.37). The African American respondents (M=2.80) more positively rated the statement that the information that they received from church- and religious-based organizations related to college influenced their decision to attend college more so than did Caucasian respondents (M=2.14). Finally, Asian respondents (M=3.00) and African American respondents (M=2.58) were significantly more positive than Caucasian respondents (M=1.58) in their response to the item related to the financial support of church- and religious-based organizations influencing their decision to attend college.

The final subscale, in the subset related to community and civic organizations, demonstrated significant differences. Asian respondents (M=3.18) were significantly more positive in their response than Caucasian respondents (M=1.83) to the item stating that information gained through a community/civic organization, such as the YMCA, Big Brothers/Big Sisters, Rotary Club, etc., was influential in their decision to attend college. In addition, the ANOVA found a significant difference between the responses of African Americans (M=2.76) and Caucasians (M=2.01) in the item related to the impact of financial support from one of these community/civic organizations on their college choice process. The final significant difference in this subscale related to the impact of the encouragement from a community/civic organization or its members, where the responses of African Americans (M=2.75) were significantly higher than for Caucasian respondents (M=2.06).

Limitations/Recommendation For Further Study

As with most research, there were several limitations that were identified by the researchers after this study was conducted. The first limitation was related to the analysis of the respondents
based only upon their ethnicity. The evaluation of the results solely upon this characteristic limits the study in that other characteristics may have influenced student decision to attend college. Additionally, only students from a large research institution were included in the study. As students at various types and sizes of institutions have different reasons for attendance, it would be imperative that students from a variety of institutions be evaluated to provide a more clear understanding of the decision to attend college. Finally, students who have not graduated from high school may be analyzed also to provide a more accurate view of the decision-making process because they are not as far removed as some of the participants in this study.

**Discussion**

The model developed by Hossler and Gallagher (1987) has been significant in rationalizing the college choice process for high school students. Subsequent models and research have attempted to further their efforts (Abraham and Jacobs 1990; Cabrera, Nora, Terenzini, Pascarella, and Hagedorn 1999; Dixon and Martin 1991; Horvat 1996; Hossler, Schmit, and Vesper 1999; Martin and Dixon 1991; Smith and Matthews 1992), but there seemed to be a void in the literature related to the specific individuals and organizations that impact this decision-making process. Additionally, these models have failed to evaluate the impact of the encouragement and financial support for students by these individuals and organizations as they determine whether they will attend college. This study attempted to address this void, especially regarding the predisposition stage of the Hossler and Gallagher (1987) model.

As a group, the respondents indicated that their primary reason for attending college was to achieve personal and career goals. Additionally, it seems that parents and friends have a significant role in their decision to attend college. Despite the efforts of college representatives and their recruiting materials, students did not rate these efforts as highly in terms of their decision to attend college. The only factor that appeared from this category was related to taking field trips to visit colleges. It is difficult to determine the true impact of this item because the item does not delineate whether family members, college representatives, personnel from their high school, or some other individual/group initiated the field trip. This is not to say that the efforts of college personnel should be eliminated, but their
efforts should focus more on how a college education from their respective institutions can impact the achievement of personal and career goals. This connection can be achieved by accurately marketing the careers related to specific majors and graduate success rates in achieving jobs in these fields.

Due to participant differences based upon race in the ratings of the items, some interesting differences did come from the study. The findings indicate that admissions personnel and public relations material influenced African American students’, and in some cases Hispanic students’, college choice. The actual interaction with representatives from these offices and the literature that they distributed were important in these students’ decision-making process. Additionally, the visibility of this public relations material in the schools of African-American and Hispanic students was also important. As many states are enacting laws that require institutions to eliminate affirmative action activities in their recruitment efforts, higher education recruiters should be proactive in establishing linkages and increasing visibility in schools that have considerable diverse student populations.

African American students also stated that church- and religious-based organizations were more influential in their college choice. The support of these organizations included moral as well as financial support. As research has shown that churches serve as a significant social network of support and encouragement for African Americans (Taylor and Chatters 1988), recruiters from institutions of higher education should make efforts to establish more formal relationships with these organizations.

Table 2b: Responses to the Importance of Selected Factors to Student Decision to Attend College, by Race (continued)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Asian (N=11)</th>
<th>Hispanic (N=11)</th>
<th>African American (N=82)</th>
<th>Caucasian (N=84)</th>
<th>Native American (N=14)</th>
<th>Other (N=17)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>High School Personnel &amp; Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teachers’ support and encouragement</td>
<td>3.73</td>
<td>1.19</td>
<td>3.91</td>
<td>0.83</td>
<td>3.58</td>
<td>1.03</td>
</tr>
<tr>
<td>High school counselor’s or other school personnel’s support and encouragement</td>
<td>3.64</td>
<td>0.92</td>
<td>3.82</td>
<td>0.75</td>
<td>3.26</td>
<td>1.28</td>
</tr>
<tr>
<td>Being enrolled in a high school program that prepared me for college</td>
<td>4.55</td>
<td>0.82</td>
<td>3.55</td>
<td>1.04</td>
<td>3.77</td>
<td>1.24</td>
</tr>
<tr>
<td>Civic/Community Support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information gained through a community/civic organization (Boys &amp; Girls Clubs, YMCA, Big Brothers/Big Sisters, Kiwanis, Rotary Club, etc.)</td>
<td>3.18</td>
<td>1.40</td>
<td>2.55</td>
<td>1.21</td>
<td>2.35</td>
<td>1.37</td>
</tr>
<tr>
<td>Financial support gained through a community/civic organization</td>
<td>3.10</td>
<td>1.45</td>
<td>2.91</td>
<td>1.22</td>
<td>2.76</td>
<td>1.40</td>
</tr>
<tr>
<td>Encouragement of a community/civic organization or its members</td>
<td>3.09</td>
<td>1.22</td>
<td>2.45</td>
<td>1.44</td>
<td>2.75</td>
<td>1.31</td>
</tr>
<tr>
<td>College Personnel/Recruitment Efforts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity to participate in college athletics due to scholarship</td>
<td>2.45</td>
<td>1.64</td>
<td>1.91</td>
<td>1.22</td>
<td>2.18</td>
<td>1.42</td>
</tr>
<tr>
<td>Opportunity to participate in other extracurricular activity due to a scholarship</td>
<td>3.27</td>
<td>1.42</td>
<td>3.27</td>
<td>1.19</td>
<td>2.93</td>
<td>1.47</td>
</tr>
<tr>
<td>Encouragement from an admission counselor from an institution of higher education</td>
<td>3.00</td>
<td>0.89</td>
<td>3.64</td>
<td>0.92</td>
<td>3.01</td>
<td>1.37</td>
</tr>
<tr>
<td>An admission counselor from an institution of higher education providing information about college</td>
<td>3.36</td>
<td>0.67</td>
<td>3.82</td>
<td>0.75</td>
<td>3.40</td>
<td>1.19</td>
</tr>
<tr>
<td>Field trips to college campuses</td>
<td>3.27</td>
<td>0.91</td>
<td>3.91</td>
<td>0.94</td>
<td>3.45</td>
<td>1.24</td>
</tr>
<tr>
<td>Advertisements of college in your community or school</td>
<td>3.45</td>
<td>0.69</td>
<td>3.73</td>
<td>1.27</td>
<td>3.10</td>
<td>1.36</td>
</tr>
<tr>
<td>Information about college gained from a college recruiter</td>
<td>3.91</td>
<td>0.94</td>
<td>3.55</td>
<td>1.13</td>
<td>3.43</td>
<td>1.23</td>
</tr>
</tbody>
</table>

This effort would transcend, but not neglect, the traditional method of college recruitment personnel to pursue students only through their high schools. Additionally, this may be conducive to the recruitment of students with Asian backgrounds. In this study, Asian students reported the financial support from church- and religious-based organizations was significantly influential in their decision to attend college.

Community and civic organizations were also important to African American and Asian students in the study as they made their decision to attend college. The types of influence varied, but these factors included information about college, financial support, and encouragement that was received from these groups. As with the strategy to approach churches and other religious groups as a recruitment method, college recruiters should also expand their recruitment efforts by establishing more formal relationships with individuals who participate in community and civic organizations. Students who may be attending these organizations’ meetings and activities may be first-generation students; thus the college-educated individuals in these organizations may be influential in the college-choice decisions of these students.

**Conclusion**

Higher education has the potential to provide many opportunities for students. However, limited access to information can be a hindrance to some students. This study attempted to assess how college students make the decision to attend college based...
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on areas that had not previously been researched. Consequently, new information was found regarding what most influences the decision to attend college.

As more institutions are confronted with issues of attempting to diversify their student bodies despite anti-affirmative action laws and legislation, alternative methods of recruitment are going to need to be employed. By understanding what was most important to those students who are presently attending their institutions, these institutions can be more proactive in their efforts to recruit future generations of students from varying ethnic backgrounds.

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Gibbs, R. M. 1995. Going away to college and wider urban job opportunities take highly educated youth away from rural areas. Rural Development Perspectives, 10(3): 33–43.


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Today, more than 20 percent of the undergraduate student population at four-year institutions in the U.S. are first-generation students (Nunez and Cuccaro-Alamin 1998). First-generation students are generally defined as those whose parents have no college or university experience (Billson and Terry 1982; Nunez and Cuccaro-Alamin 1998; York-Anderson and Bowman 1991).

Several researchers found that first-generation college students are at a higher risk for attrition than second-generation students (Pratt and Skaggs 1989; Terenzini et al. 1996). First-generation students usually have lower high school GPAs, SAT scores, and educational aspirations (Nunez and Cuccaro-Alamin 1998; Riehl 1994; Terenzini et al. 1994, 1996). Their comparatively weak academic background may be related to their personal and family background (Levine and Nidiffer 1996; Rhorrer and Clark 1997; Riehl 1994). They are more likely to come from low-income families, enroll as part-time students, and commute to school. They also usually lack parental support, as their parents do not recognize the need for higher education and do not understand how to apply for and obtain financial aid (Rhorrer and Clark 1997; York-Anderson and Bowman 1991). First-generation students of ethnic minorities may face more challenges. Richardson and Skinner (1990) found that these students lack community support, role models, sufficient academic preparation, and often experience discrimination.

Riehl (1994) reported that the first-generation student had a significantly lower first-semester GPA and higher dropout rate than other students. In a report of the National Center for Education Statistics (NCES), Nunez and Cuccaro-Alamin (1998) found that first-generation students were less likely to persist in higher education and complete their degrees.

University administrators need more information about first-generation students to provide appropriate services. However, relatively little information is found on how the students’ background and problems relate to their performance and retention in college. Also, little has been written on first-generation students from an ethnic minority background. This study examined factors of retention for students of color.

Studies have found that a number of non-cognitive factors are related to academic achievement and student retention of non-traditional students. These include: positive self-concept, a realistic self-appraisal system, preference for long-term goals, a strong supportive person, leadership experience, demonstrated community service, and acquired knowledge in a field (Hood 1992; Ting 1998; White and Sedlacek 1986). The conceptual basis of these factors addresses the psychosocial and cultural background of the students and their abilities to integrate into the new university community. Previous studies show that the non-cognitive factors were similar or more effective than standardized test scores in predicting changes of academic achievement over a four-year college study (Tracey and Sedlacek 1985, 1987). For example, self-concept and self-appraisal were found to be consistent factors in college years while long-term goals, acquired knowledge in a field, and coping with racism were factors in latter years. The current study also examined the longitudinal relationship between non-cognitive factors and academic achievement.

Method

Participants
Two-hundred fifteen first-generation students participated in a new student orientation with other students at a Southeastern
public research university. Over 90 percent of all new students attended the orientation. The students responded to a questionnaire that included two items on their parents' education level. Based on the response of this particular item, the students with parents who have no college or university experience were identified for this study. The university is located in an urban area and about 80 percent of students live on or near campus. In this study, there were 159 Caucasians (74 percent) and 56 students of color (26 percent) [35 African Americans, 18 Asian Americans, 2 Hispanic and 1 Native American]. The mean age was 18.17. Of the sample, 110 were men (51.2 percent) and 105 were women (48.8 percent).

**Measures**

**Predictors.** The eight non-cognitive scales from the NCQ, Non-Cognitive Questionnaire (Tracey and Sedlacek 1984) and the SAT (verbal and math scores) were adopted to predict the students' grade point average (GPA) in the first year. The Admission Index (AI) was another predictor, which is used for admission purposes at the university. AI ranges from 0.0 to 4.0, and is calculated from a student's high school GPA, class rank and other test scores. These predictors were also used in discriminant analyses studying enrollment status over four years.

**Non-Cognitive Questionnaire.** Tracey and Sedlacek (1984) designed the NCQ to assess psychosocial aspects of students thought to influence academic success. The NCQ contains 23 items: 18 Likert-formatted, 2 multiple choice, and 3 open-ended questions. Below are the NCQ's eight scales with possible score ranges in brackets:

- positive self-concept [7-27]
- realistic self-appraisal system [4-14]
- demonstrated community service [2-8]
- knowledge acquired in a field [2-8]
- successful leadership experience [3-13]
- preference of long-range goals over short-term, immediate goals and ability to defer gratification to attain goals [3-13]
- ability to understand and cope with racism [5-25]
- availability of a strong support person [3-15]

The NCQ recorded a two-week test-retest reliability range from 0.74 to 0.94, with a median of 0.85 for its items (Tracey and Sedlacek 1984). Interrater reliability on the three open-ended items ranged from 0.73 to 1.00. The NCQ was widely studied and was found applicable to different student populations (Fuertes and Sedlacek 1995; Ting 1998; Ting and Robinson 1998; Tracey and Sedlacek 1985, 1989). The NCQ appears to have good content validity, strong construct, and predictive validity.

Moderate to strong predictive validities were found for grades and retention for different student groups: Whites and Blacks (Hood 1992; Tracey and Sedlacek 1984, 1985, 1987), Asian Americans (Fuertes, Sedlacek, and Liu 1994), Hispanics (Fuertes and Sedlacek 1993), Mexican Americans (Arbona and Novy 1990), Native American Students (Ting and Bryant 2001), specially-admitted students (Hood 1992; White and Sedlacek 1986), and student athletes (Sedlacek and Adams-Gaston 1992).

**Criterion variables.** GPA (ranging from 0.0 to 4.0) of first and third semesters and enrollment status (1 = enrolled; 0 = dropping-out) over four years were the criterion variables.

**Procedure**

**Data collection.** During a new student orientation, all participants (N = 215) in the study responded to the NCQ in small groups along with other new students. Students consented to participating in the study and access of their academic records. They did not receive any compensation from the study.

**Data analysis.** Using SPSS, multiple step-wise regression analyses were employed for predicting GPAs for the first and third semesters. Non-cognitive and SAT scores and the Admission Index were used as predicting variables. Predictions were computed by two groups: Caucasians and students of color. In the regression analysis, gender was entered first as a controlled factor. Next, non-cognitive scale scores were entered in a step-wise procedure to explore their relationship with semester GPAs, then SAT scores, and finally the Admission Index. Such procedure was recommended when comparing two measures: well-established SAT scores and Admission Index as compared to relatively new non-cognitive scales (Fuertes, Sedlacek, and Liu 1994; Tracey and Sedlacek 1988). The relationship of the non-cognitive scales, SAT scores, and Admission Index to continued enrollment was also examined with step-wise discriminant analysis at third, fifth, seventh, and eighth semesters.

**Results**

Table 1 (on the following page) shows the means and standard deviations of the predictor and criterion variables. The students of color appear to have lower mean SAT scores, Admission Index, and first-semester GPA than the Caucasian students. They also have lower mean scores on demonstrated community service and acquired knowledge in a field than their majority peers. However, they have higher mean scores on the understanding and coping with racism scale than Caucasians.

Table 2 (on the following page) shows the multiple prediction models for GPA for the students by race in the first and third semesters. SAT math and the Admission Index were stronger predictors than non-cognitive variables in the first semester and for Caucasian students. Several non-cognitive variables predicted GPAs for students of color: coping with racism, leadership experience, and community services. In the third semester, they were typically similar to or better than possibly using SAT scores alone for students of color. When the NCQ was used in conjunction with SAT scores or Admission Index, relatively stronger predictions were achieved.

Specific non-cognitive variables that significantly added to prediction in each analysis are listed in Table 2. Successful leadership experience was related to Caucasian students’ academic performance in the first semester, accounting for 5 percent of the variance. Demonstrated community service was a predictor in Semester 3. It explained 4 percent of the variance for Caucasian
and 15 percent for students of color. These findings reflected the need to build a relationship in the new community and a sense of belonging to the university. SAT math scores explained a range of 4 percent to 16 percent of the variance in the prediction for students’ GPA. The studied university is a land-grant institution popular for science and technology majors. This may be why most students need a strong mathematical background to achieve academically. The Admission Index was a relatively strong predictor for Caucasians, but not for students of color. This information reflects the complexity of academic success factors other than high school GPAs and test scores making up the Admission Index.

Several non-cognitive variables were found to be moderately related to continuing the enrollment of students of color (Rc ranging from 0.29 to 0.52). [See Table 3 on the following page.] Coping with racism (Rc = 0.34) was important for students of color in the third semester, reflecting the challenge of adjusting into a multicultural campus and the possibility of racism on campus in the freshman year. Preference of long-term goals (Rc 0.28 to 0.29) was moderately strong as related to persistence during the fifth and sixth semesters. The students who had longer-term goals continued to achieve in their studies. Acquired knowledge in a field (Rc = 0.32) was a significant factor for continued enrollment in the sixth semester and reflected the importance of studying and completing an academic discipline. In the eighth semester, a strong support person and realistic self-appraisal were related to a student’s enrollment (Rc = 0.52).

**Discussion**
The current study shows that non-cognitive variables, SAT math score, and the Admission Index were moderate indicators for the first-generation students’ academic success beyond the first year. This new information adds to the professional literature that earlier research did not study (Ting 1998; White and Sedlacek 1986). SAT math score was not a good indicator for persistence of first-generation students of color. It seems that non-cognitive variables might affect these students more. This finding was similar to earlier studies (Ting 1998; White and Sedlacek 1986).

### Table 1: Means and Standard Deviations of Predictors and Criterion Variables in First Semester

<table>
<thead>
<tr>
<th>Variable</th>
<th>All Students (N=215)</th>
<th>Caucasians (N=159)</th>
<th>Students of color (N=56)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>SAT-verbal</td>
<td>535.02</td>
<td>73.27</td>
<td>554.97</td>
</tr>
<tr>
<td>SAT-math</td>
<td>559.53</td>
<td>74.68</td>
<td>572.64</td>
</tr>
<tr>
<td>Admission index</td>
<td>2.74</td>
<td>0.33</td>
<td>2.78</td>
</tr>
<tr>
<td>Positive self concept</td>
<td>18.73</td>
<td>2.38</td>
<td>18.84</td>
</tr>
<tr>
<td>Realistic self appraisal</td>
<td>9.86</td>
<td>1.73</td>
<td>9.83</td>
</tr>
<tr>
<td>Coping with racism</td>
<td>18.37</td>
<td>2.09</td>
<td>18.24</td>
</tr>
<tr>
<td>Preference of long term goals</td>
<td>8.80</td>
<td>1.54</td>
<td>8.81</td>
</tr>
<tr>
<td>A strong support person</td>
<td>13.02</td>
<td>1.86</td>
<td>13.07</td>
</tr>
<tr>
<td>Successful leadership experience</td>
<td>9.08</td>
<td>1.93</td>
<td>9.04</td>
</tr>
<tr>
<td>Demonstrated community service</td>
<td>5.33</td>
<td>1.31</td>
<td>5.47</td>
</tr>
<tr>
<td>Acquired knowledge in a field</td>
<td>3.87</td>
<td>1.10</td>
<td>3.92</td>
</tr>
<tr>
<td>First semester GPA</td>
<td>2.83</td>
<td>0.76</td>
<td>2.87</td>
</tr>
</tbody>
</table>

Note: SAT = Scholastic Aptitude Test; GPA = grade point average

### Table 2: Multiple Regression Models Predicting First and Third Semester GPAs

<table>
<thead>
<tr>
<th>Semester/Students/Variable</th>
<th>R</th>
<th>R²</th>
<th>F</th>
<th>β²</th>
<th>t</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All students (N=215)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coping with racism</td>
<td>0.14</td>
<td>0.02</td>
<td>4.3²</td>
<td>0.14</td>
<td>2.1²</td>
</tr>
<tr>
<td>SAT-math</td>
<td>0.27</td>
<td>0.07</td>
<td>8.4²</td>
<td>0.23</td>
<td>3.5²</td>
</tr>
<tr>
<td>Admission Index</td>
<td>0.41</td>
<td>0.17</td>
<td>14.6²</td>
<td>0.36</td>
<td>4.9²</td>
</tr>
<tr>
<td>Caucasians (N=159)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leadership experience</td>
<td>0.22</td>
<td>0.05</td>
<td>7.8²</td>
<td>0.22</td>
<td>2.8²</td>
</tr>
<tr>
<td>Admission Index</td>
<td>0.46</td>
<td>0.21</td>
<td>20.9²</td>
<td>0.41</td>
<td>5.7²</td>
</tr>
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<td>Students of Color (N=56)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT-math</td>
<td>0.40</td>
<td>0.16</td>
<td>10.4²</td>
<td>0.40</td>
<td>3.2²</td>
</tr>
<tr>
<td>Third</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All students (N=175)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT-math</td>
<td>0.19</td>
<td>0.04</td>
<td>6.3²</td>
<td>0.19</td>
<td>2.5²</td>
</tr>
<tr>
<td>Admission Index</td>
<td>0.37</td>
<td>0.14</td>
<td>13.5²</td>
<td>0.37</td>
<td>4.5²</td>
</tr>
<tr>
<td>Caucasians (N=129)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community service</td>
<td>0.19</td>
<td>0.04</td>
<td>4.8²</td>
<td>0.19</td>
<td>2.2²</td>
</tr>
<tr>
<td>Admission Index</td>
<td>0.40</td>
<td>0.16</td>
<td>12.0²</td>
<td>0.36</td>
<td>4.3²</td>
</tr>
<tr>
<td>Students of Color (N=46)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community service</td>
<td>0.38</td>
<td>0.15</td>
<td>7.6²</td>
<td>-0.38</td>
<td>-2.8²</td>
</tr>
<tr>
<td>SAT-math</td>
<td>0.55</td>
<td>0.30</td>
<td>9.1²</td>
<td>0.39</td>
<td>3.0²</td>
</tr>
</tbody>
</table>

*a p < 0.05; b p < 0.01; c p < 0.001; d Standardized Beta
Demonstrated community service was found to be an indicator for academic success for the first-generation students. It also confirmed similar findings of an earlier study (Ting 1998). Community service reflects the ability of first-generation students to build a sense of belonging and to connect to the university community. First-generation students were found to have lower social adjustment and were less likely to have a social support network helping them adjust to the demands of school (Grayson 1997; Hertel 1997). These students usually lack role models or a supporting person for their college adjustment because their parents have not attended college (London 1989, 1992).

Experiences in community service represent the ability to engage in a social group, communicate well, establish a relationship in a new community, and accomplish tasks with others in groups. The first-generation students who have such experiences better adjust to the university setting. Such experiences were also found to be related to academic success for other student populations such as Asian Americans (Fuertes, Sedlacek, and Liu 1994), specially admitted students (Ting 1997), and White and Black students (Tracey and Sedlacek 1984, 1985). It appears that college students having such experiences are more likely to achieve academically. Like their peers, first-generation students “must adapt academically and socially to their new institutional surroundings, and the extent to which they adapt can play a role in their postsecondary outcomes” (Nunez and Cuccaro-Alamin 1998, p.2). Therefore, academic advisors and university instructors should encourage first-generation students to participate in student activities and to volunteer in the campus community.

However, first-generation students are usually not involved in campus activities (Pratt and Skaggs 1989; Terenzini et al. 1994). These students are always from low-income families and have more financial needs than traditional students (Nunez and Cuccaro-Alamin 1998; Riehl 1994). In the current study, the students of color were from lower family income backgrounds (average at $30,000) as compared to their Caucasian peers (average at $37,500). They also showed more need for financial aid, just as other studies have reported (Levine and Nidiffer 1996). That may be why they are more likely than their peers to work more hours, to enroll part-time, and to attend two-year institutions (Kojaku and Nunez 1999). Therefore, they have less time for campus activities than do their peers. Higher education professionals in financial aid and admissions should understand first-generation students’ family and personal backgrounds and help them obtain financial aid or support. Only then may first-generation students focus on their academic studies and attend more campus activities.

The first-generation students who had long-term goals persisted in their studies. In the current study, they also showed more certainty on college majors than non-first-generation students. Therefore, first-year programs and student support services should cover not only academic/studying skills topics, they should include career exploration and development, and choosing a major. In particular, transition programs can provide opportunities for these students to learn about the expectations and demands of college in a supportive, low-risk environment (Koehler and Burke 1996). These programs usually provide academic and psychosocial curricula in a small class and were found to be successful in improving college achievement (Koehler and Burke 1996).

**Conclusion**

The current study confirmed an earlier study that race is an important factor in understanding academic success (Ting and Robinson 1998). Like other students, SAT scores and the Admission Index are less effective in explaining academic success and persistence for first-generation students of color. This finding supports the perceptions on the unique challenges facing minority first-generation students (Richardson and Skinner 1992). Such challenges include racial discrimination, a lack of role models, and little community support. Therefore, student affairs professionals should become advocates and supporters for them. On the other hand, the current study raised a concern about the validity of using SAT scores alone for admissions decisions and its relation to college academic success. Instead, in conjunction with standardized tests such as SAT scores, Sedlacek (1998) suggested

### Table 3: Canonical Rc for Each Discriminant Analysis on Continuing Enrollment

<table>
<thead>
<tr>
<th>Semester</th>
<th>Sample</th>
<th>N</th>
<th>NCQ Scores</th>
<th>SAT Scores</th>
<th>Admission Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Third</td>
<td>Caucasians</td>
<td>159</td>
<td>—</td>
<td>—</td>
<td>0.23</td>
</tr>
<tr>
<td></td>
<td>Students of color</td>
<td>56</td>
<td>0.34</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Fourth</td>
<td>Caucasians</td>
<td>130</td>
<td>0.28</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Students of color</td>
<td>46</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Fifth</td>
<td>Caucasians</td>
<td>123</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Students of color</td>
<td>45</td>
<td>0.29</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Sixth</td>
<td>Caucasians</td>
<td>115</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Students of color</td>
<td>42</td>
<td>0.32</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Seventh</td>
<td>Caucasians</td>
<td>110</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Students of color</td>
<td>40</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Eighth</td>
<td>Caucasians</td>
<td>110</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>Students of color</td>
<td>39</td>
<td>0.52</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

a p < 0.01

b p < 0.005

c Wilks Lambda = 0.947, $\chi^2 = 8.506$, df = 1; significant variables: Admission Index

d Wilks Lambda = 0.884, $\chi^2 = 6.583$, df = 1; significant variables: Coping with racism

e Wilks Lambda = 0.921, $\chi^2 = 10.418$, df = 1; significant variables: Preference of long-term goals, community service

f Wilks Lambda = 0.921, $\chi^2 = 10.418$, df = 1; significant variables: Preference of long-term goals

g Wilks Lambda = 0.899, $\chi^2 = 4.228$, df = 1; significant variables: Acquired knowledge in a field

h Wilks Lambda = 0.734, $\chi^2 = 11.134$, df = 2; significant variables: A strong support person, realistic self-appraisal system

i No drop-outs
adding non-cognitive variables for admissions criteria, which better explains a student’s academic performance and persistence. The Department of Education also issued a guideline to higher education institutions advising them not to use standardized test scores alone as an admissions criterion (Healy 1999).

A limitation of the study is that it was based on a single institution and the sample size was comparatively small, particularly for students of color. In future studies, a larger sample size and more institutions will increase the power of multiple analysis and generalizability of the results. Also, the current study focused on pre-college variables in the prediction. Given the amount of variance that was not explained by this study, there is room for other variables in future studies such as involvement in academic and social activities in the university (Astin 1993), racial and cultural identity (Brookins and Robinson 1996; Ting and Bryant 2001), and personal development and socio-economic background (Tinto 1993; Ting and Robinson 1998).

References
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www.aacrao.org/jobs
With the U.S. Supreme Court poised to reconsider the precedent set in Bakke vs. Regents of the University of California and groups scurrying to hone their rhetoric on affirmative action in college admissions, it is essential that those in the public arena not be tripped up by terminology. Following is a quick primer on some of the more slippery terms in the current affirmative action debate.

**Quotas**

It is very important to understand three basic things about racial/ethnic quotas in college and university admissions:

- *Bakke* essentially banned their use in college and university admissions;
- Quotas are not the same as “plus factor” or “target” programs such as those employed at the University of Michigan (there has been some confusion over this); and
- Everyone is against quotas.

That said, coming out against quotas in the current debate is useful if:

- One’s intent is to confuse rather than clarify; or
- One wants to take a position on affirmative action that is not controversial.

**Legacy Preferences**

Admissions preference based on family legacy at a given institution, viewed by some as a useful tool for institution-building and as affirmative action for rich and well-connected students by others, can also be a minefield for those engaged in public debate.

- For those opposed to admissions preferences based on race/ethnicity, making sure that one was not admitted to college via a legacy preference is highly advisable.
- For those who want to use legacy preferences to bash critics of affirmative action, it is important not to overplay this card for three reasons: a) legacy admissions affect a small portion of the total collegiate population in the United States; b) many “legacies” are students that likely could have been admitted without the preference; and c) if legacy preferences are so odious, are preferences for artistic or athletic ability similarly objectionable?

**Percent Plans**

The affirmative action debate has now progressed to the point where “percent plans” (policies which guarantee a top percentage of high school graduates admission to colleges and universities in a particular state) are emerging as a moderate, reasonable “third way.” Before one jumps on the percent plan bandwagon, however, it is crucial to consider the following points:

- Percent plans are still relatively new (less than 10 years old), so it is difficult to draw hard conclusions about their efficacy. Moreover, researchers from the Harvard Civil Rights Project recently found that these programs have had little, if any, significant impact on boosting collegiate diversity in states where they are in effect.
- The percent plan programs depend, at least to some extent, on the existence of segregated high schools. Is that a desirable—or socially acceptable—side effect?

The points above all drive at a single conclusion: there are no easy or simple answers in the debate over affirmative action in higher education. To conduct this debate by taking irrelevant or inconsistent positions or appealing to simplistic policy solutions, whatever one’s opinion about affirmative action, does a disservice to the millions of current and future students that are counting on their leaders to get it right.

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Travis Reindl is Director of State Policy Analysis and Assistant to the President at the American Association of State Colleges and Universities (AASCU).
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The Ad Hoc Committee on Optimum Enrollment examined Eastern Illinois University’s capacity for providing instruction in order to estimate an optimum number for on-campus student enrollment. In addition, housing and other student support services and the fiscal ramifications of the number of students enrolled were considered. For purposes of this report the term capacity means “constraint” or “upper limit.”

The charge of the committee was to focus on on-campus undergraduate enrollment. For purposes of total enrollment, the ten-year average for the number of graduate students (1,081) was utilized. Further, all deliberations assumed current resource levels.

Resources and Methodology

Three business concepts for the viewing of capacity were utilized in the committee’s deliberations: theoretical, normal, and practical. They are explained below:

Theoretical capacity is based on the physical seats (or stations) available. This concept is theoretical in the sense that it does not allow for the consideration of the appropriateness of a given classroom (based on size, number and arrangement of stations, location, equipment, etc.) in relation to the actual instructional needs in any given term. Ideally, it represents the maximum capacity of the physical campus. Theoretical capacity is unattainable in the real world.

Normal capacity is the number of students that have enrolled in classes. It is the demand for classroom seats based on actual enrollments over a period of time.

Determination of practical capacity involved the consideration of the size and make-up of the instructional staff and student demand for given programs. Other constraints include those relative to scheduling teaching assignments, and classrooms with the special equipment/location required in some courses. Finally, the relationship between resources and demand for specific academic programs was considered. For the purposes of this report, practical capacity was viewed globally and equals optimum on-campus enrollment.

The committee collected quantitative and qualitative data in an attempt to develop an algorithm to be used to determine the optimum on-campus enrollment for Eastern. This proved impossible because of a myriad of complicating factors. Therefore, while the final estimate of optimum on-campus enrollment was based on the data discovered, it was tempered by the collective experience and judgment of the committee members.

Theoretical capacity was estimated from the data regarding rooms and stations (physical “seats”) found in the Fall 2001 Space Utilization Report, the Spring 2002 Student Enrollment vs. Space Utilization Report, the Spring 2002 Space Utilization Report, and the Fall 2002 Space Utilization Report provided by the Facilities Planning and Management Division. The reason it is only estimated is that it is a moving target with individual classrooms as well as buildings in and out of service.

In order to determine normal capacity, the committee examined the maximum seats assigned and utilization data from the Facilities Planning and Management Division and the Fall On-Campus Enrollment Data: Fall Ten-Year Comparison generated by the Office of Enrollment Management.

To calculate approximate practical capacity, the data cited above were employed along with actual enrollments by major. In addition, department chairs were asked for an estimate of the optimum number of majors their department could instruct given current resource levels and service commitments.

Other elements factored into the determination of the practical capacity of Eastern were housing and other student support services. Finally, the committee examined Illinois Board of Higher Education reports.

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Education (IBHE) productivity reports to try and ascertain the possible fiscal ramifications of various levels of student enrollment.

**Findings**

**THEORETICAL CAPACITY**

According to the *Spring 2002 Student Enrollment vs. Space Utilizations Report* of the Facilities Planning and Management Division, the estimated capacity based on the available physical space is 8,579 as shown in Table 1. Again, this is an approximation based on the information available at this time.

<table>
<thead>
<tr>
<th>Room Type</th>
<th>No. of Rooms</th>
<th>Square Feet</th>
<th>Student Stations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classroom</td>
<td>149</td>
<td>113,635</td>
<td>6,047</td>
</tr>
<tr>
<td>Class Lab</td>
<td>72</td>
<td>70,016</td>
<td>1,553</td>
</tr>
<tr>
<td>Open Lab</td>
<td>55</td>
<td>38,945</td>
<td>783</td>
</tr>
<tr>
<td>Research Lab</td>
<td>45</td>
<td>13,842</td>
<td>196</td>
</tr>
<tr>
<td>Campus Total</td>
<td>321</td>
<td>236,438</td>
<td>8,579</td>
</tr>
</tbody>
</table>

Source: Spring 2002 Student Enrollment vs. Space Utilization Report

<table>
<thead>
<tr>
<th>Period</th>
<th>Time</th>
<th>Available Stations/Seats</th>
<th>Number of Seats per Student</th>
<th>Maximum Physical Occupancy</th>
<th>Maximum Utilization (75%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8:00 am</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>9:00 am</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>10:00 am</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>11:00 am</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>12:00 pm</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1:00 pm</td>
<td>8,579</td>
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<td></td>
</tr>
<tr>
<td>7</td>
<td>2:00 pm</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>3:00 pm</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>4:00 pm</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daytime Total</td>
<td>77,211</td>
<td>5425</td>
<td>15,442</td>
<td>11,382</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>5:00 pm</td>
<td>8,579</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>11</td>
<td>6:00 pm</td>
<td>8,579</td>
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<td></td>
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</tr>
<tr>
<td>12</td>
<td>7:00 pm</td>
<td>8,579</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evening Total</td>
<td>25,737</td>
<td>5425</td>
<td>5,147</td>
<td>3,861</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>102,948</td>
<td>5425</td>
<td>20,590</td>
<td>15,442</td>
<td></td>
</tr>
</tbody>
</table>

**NORMAL CAPACITY**

Table 3 displays the actual on-campus student enrollment in various categories for 1993 to 2002. Given these numbers, it is reasonable to state that the normal capacity of the University is 10,427. This would include 9,346 undergraduate and 1,081 graduate students.

**PRACTICAL CAPACITY**

There are several ways to approach the estimation of practical capacity. Perhaps the easiest way is to look at the actual enrollment over a period (see Table 3) and say that when enrollment was at its peak in 1997 (10,816), across campus the general feeling was that there were too many students. Further, the feeling was that there were not enough students when the enrollment was at its lowest in 2001 (9,653). Utilizing this method, the practical capacity is somewhere between 9,653 and 10,816.

Another method is to use a selected student/faculty ratio. In his 1994 Planning Initiatives, the provost declared the goal for this ratio to be 18 to 1. The Fall 2002 faculty count is shown in Table 4 on the following page.

Table 5 displays the calculation of practical on-campus enrollment numbers based on the student/faculty ratio. If only full-time faculty members are considered, the practical capacity is 10,530. Factoring in part-time faculty the number grows to 10,863, assuming an average load of 25 percent, and 11,196, if the average load is 50 percent. So, this calculation places the practical capacity between 10,530 and 11,196 students. It is likely that

If the number of classes per student is estimated at 5, then the approximate student capacity of the University is obtained by dividing the available stations by 5 as shown in Table 2. The resulting numbers are 15,442 for courses before 5:00 p.m. and 5,147 for courses after 5:00 p.m. These numbers assume every seat in every instructional space is occupied every hour of the day from 8:00 a.m. until 8:00 p.m.

If 75 percent is used as the conventional wisdom regarding the maximum amount of a university’s instructional space it is possible to schedule, a day-time utilization of 11,582 and an evening utilization of 3,861 (Table 2) results. Hence, an educated guess regarding the theoretical capacity for on-campus students at Eastern is 15,442.
the actual part-time load is closer to 25 percent, which yields a practical capacity of 10,865.

Another means employed to gather information regarding the practical capacity was to ask the chairs for their best estimate regarding their department’s capacity for undergraduate majors. The sum of the numbers returned was 8,980. Since there are usually around 1,200 undeclared students enrolled in a given fall term, the practical capacity could be said to be 10,180 undergraduate students.

Consideration of this number must be tempered with the understanding that ideal distribution of students across majors is generally not possible. Demand for majors changes over time and institutions of higher education are not well equipped to react quickly to these changing demands.

**Other Factors**

- **Student Affairs**: When considering the optimum enrollment for the campus, the impact on the quality of student services supporting the academic experience at Eastern is the primary concern. All Student Affairs departments with the exception of the Counseling Center rely on student and user fees for their operational needs. Establishing an optimum enrollment that will support the staffing levels, fiscal resources, and physical capacity of the departments is critical to maintaining the high level of service currently afforded students.

  Student Affairs has demonstrated it can provide quality services to the student population regardless of the size of the student body. However, the optimum on-campus enrollment would be between 10,500 and 11,000 students (undergraduate and graduate).

  In evaluating the Student Affairs capacity, there are three concerns. First, while quality service will always continue, some of the offerings may need to experience cutbacks due to a shortage of funding. Secondly, if the enrollment pattern stabilizes, therefore producing a significant increase in size of the upperclassmen levels, some of the Student Affairs departments will require additional staffing and monetary resources.

  And, third, an entering freshman class of 1,900 represents the break-even point for the Housing budget. An incoming freshman class above 1,900 allows for a more aggressive renovation program resulting in improved housing.

- **Fiscal/Political**: Basic economic principles can be utilized to form a fiscal perspective to address optimum enrollment. In a purely economic sense, credit hours could increase to a point where the incremental variable costs would not be covered. In business, as long as the increases in productivity provide dollars to cover incremental variable costs and some portion of the fixed costs, production increases. This assumes quality is not degraded in the process and the demand continues.

  The fact is that the Illinois Board of Higher Education and the Legislature review the average credit hour production of the state universities during their budget consideration. The average is simply the total credit hours generated divided by the total number of “staff years.”

  Reviewing the latest data available (FY01) for credit hours generated by faculty “staff year,” Eastern (see Table 6) was under the state average by 12.5 percent for undergraduates. The undergraduate enrollment for Fall 2001 was 8,630. A 12.5 percent enrollment increase would have yielded 302,465 credit hours. This equates to 9,705 on-campus undergraduate students enrolled in 30 credit hours per year. This 12.5 percent increase would have resulted in Eastern being at the state-wide average for FY01.

<table>
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<th>Academic Rank</th>
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<th>Part-Time</th>
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<td></td>
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<td>Percent</td>
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Source: Planning & Institutional Studies (www.eiu.edu/~planning/fact/0602/FSfaculty.html)

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<tr>
<th>Location</th>
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<th>EIU Compared to State Credit Hours</th>
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Source: Data Book on Illinois Higher Education, 2002

**Summary**

The committee’s primary effort was given to consideration of on-campus undergraduate enrollment. In some instances, it was not possible (or useful) to separate graduate and undergraduate figures in the calculations. In any case, the ten-year average for the number of graduate students (1,081) was utilized in going from undergraduate to total students or total to undergraduate students. The final conclusions are offered in terms of total on-campus students. Further, all deliberations assumed current resource levels.

- Based on the physical stations or seats available, the estimated theoretical capacity for on-campus total students at Eastern is 15,442.

- Based on the ten-year average of actual fall on-campus total enrollments, the normal capacity of the University is 10,427.
Utilizing actual ten-year total enrollment figures, the practical capacity is somewhere between 9,653 and 10,816.

Basing calculations on a student/faculty ratio of 18 to 1, the practical capacity for total students is between 10,530 (full-time faculty only) and 11,196 (full-time plus part-time at 50 percent load).

Adding 1,200 undeclared students to the sum of the chairs, best estimates regarding the number of majors (8,980) yields a practical capacity of 10,180 undergraduate students and 11,261 total on-campus students.

The Student Affairs practical capacity is between 10,500 and 11,000 total on-campus students.

Calculating the number of students needed to bring Eastern to the state-wide average credit hours generated by faculty “staff year” in FY01 resulted in 9,705 undergraduates and 10,786 total on-campus students.

The committee considered a variety of factors, which resulted in varying estimates of capacity at Eastern. These estimates for total on-campus undergraduate and graduate student enrollment capacity range from 9,653 (see Table 3) to 15,442 (see Table 2).

**Conclusions**

Based on a review of the numbers associated with normal capacity and practical capacity, the optimum total on-campus undergraduate and graduate enrollment for Eastern Illinois University falls in the 10,400 to 11,000 range. The first thing to note is that this is well below the University’s theoretical capacity of approximately 15,400. Therefore, a physical limitation does not exist relative to the optimum on-campus enrollment number.

In order to narrow this range, consideration was given to the campus feeling that 10,816 students exceeded capacity in 1997. Further, if in the student/faculty ratio scenario the part-time load is actually 25 percent, a practical capacity of 10,863 emerges. Also, the committee’s deliberations were informed by the fact that the estimate of the chairs represents an ideal distribution of students that is not likely to be realized.

Therefore, by consensus, the committee recommends an optimum total on-campus undergraduate and graduate student enrollment for Eastern Illinois University of 10,400 to 10,800.

**Further Considerations**

With regard to the practical capacity as defined by the credit hours production model, the committee notes that the number calculated does not fall outside the given range. The committee recognizes the potential fiscal and political benefit of adopting an optimum enrollment strategy whereby the credit hours generated by a faculty “staff year” fall approximately within the state-wide average. However, it is recommended that continued priority be given to Eastern’s positioning as a comprehensive university with small classes and personal attention.

The committee recognizes that determining the total on-campus optimum enrollment for the University is only one factor in managing enrollment. The development of an enrollment matrix to address the make-up of on-campus enrollment is the next initiative for the University to consider. The enrollment matrix would determine student enrollments by class level. Factors to be addressed would include size of the entering freshman and transfer classes, along with student retention and graduation rates. The committee recommends that the Enrollment Management Advisory Committee’s sub-committee on entering class data be charged with developing this matrix.

Other members of the Ad Hoc Committee on Optimum Enrollment contributing to the content of this article include Julia Abell, Planning and Institutional Studies; Larry Cannon, Business Affairs; Will Hine, School of Continuing Education; Mark Hudson, Housing and Dining Services; Stephen Laribee, College of Business and Applied Sciences; Kimberly Moock, Orientation; Terry Perkins, College of Arts and Humanities; Kathlene Shank, College of Education and Professional Studies; and Dan Sheeran, College of Sciences.
Enrollment Management: A New Leadership Paradigm in Higher Education

Today, the term “enrollment management” cannot only be heard throughout the campus hallways of private institutions, but it is echoed equally among the campus communities of most public colleges and universities. Unfortunately, what is not being heard on most campuses is the term “enrollment leadership.” Many presidents of public and private institutions, from small and large, and even selective admissions to “open door” community colleges, have been implementing enrollment management systems on their campuses throughout the past two decades (Hossler 1986). This shift to enrollment management is typically implemented in an effort to curb declining enrollments or other enrollment crises (i.e., increased attrition and graduation issues).

As diverse as colleges and universities are in America today, so, too, are the enrollment management models that have been implemented in the United States (Penn 1999). Michael Dolence, one of the leading authors on enrollment management, defines strategic enrollment management as a “comprehensive process designed to achieve and maintain the optimum recruitment, retention, and graduation rates of students, where ‘optimum’ is defined within the academic context of the institution” (Dolence 1997, p. 108). Hossler (1986), another leading authority on enrollment management, lists four enrollment management models that colleges and universities are implementing today. These models are categorized into the enrollment management committee model, the enrollment management coordinator model, enrollment management matrix, and the enrollment management division model. These four models will be further examined later in the paper.

One thing is certain; we can expect increasingly more change in higher education leadership, particularly with increased pressure on colleges and universities to stay competitive among their peer institutions for both faculty and students. For example, in January 2000, lawmakers in California, Idaho, Louisiana, New Mexico, North Carolina, Maryland, South Carolina, and Utah requested funding to raise faculty salaries to remain on par with comparable institutions (Schmidt, Selingo, and Hebel 2000). These funding requests are coming at a time when many states are either considering, or have already implemented performance-based funding. This new measure of funding may be an effort to address the public’s perceived concern over higher education’s lack of accountability.

One of the many challenges that college presidents are experiencing today is how to gain new resources to stay competitive, while keeping the tuition affordable for their students. However, in a recent study, it was reported that tuition in many states had surged to its highest increase in nearly a decade (Selingo 2000). What many public institutions are realizing is that it is increasingly necessary to enhance revenue in order to increase enrollments and private funding to their institution.

This paper is guided by the following questions. First, what is enrollment management? Second, how do the principles of a learning organization, as discussed in Senge’s *The Fifth Discipline Fieldbook*, apply to enrollment management? Finally, what are the skills needed for leaders in the field of enrollment management?

History of Enrollment Management
Enrollment declines during the 1980s and early 1990s had a tremendous impact, shifting from what we know as admissions to enrollment management (Bryant and Crockett 1993). However, enrollment professionals have been in existence since the very first colonial colleges in the early 1600s. The first enrollment position recognized was the registrar’s position, which surfaced during the twelfth century at universities in Bologna, Italy, Paris,
France, and Oxford, England (Becraft 1997). This office was then known as the office of “bedel or beadle,” and functioned as the “jack of all trades” position. The registrar’s office was responsible for maintenance of records, budget and finances, school visits, announcing lectures, and book sales (Becraft 1997). What we now know as the registrar’s office did not officially come into place until the 1400s in Oxford, England (Quann and Associates study, as cited in Becraft 1997). This position flourished in the United States during the nineteenth century. While the admissions officer’s position has been around since Harvard College was established as the first U.S. higher education institution in 1636, admissions officers were not concerned with admissions standards or enrollment numbers. Instead, the primary purpose of the admissions officer position was to enroll the clergy and those who could afford to attend, generally the wealthy (Johnson 2000). Johnson indicated that it was not until the early nineteenth century that the admissions professional position became a more formalized admissions office as:

*The concept of admission was thought of more in terms of welcoming interested students as opposed to screening them.*

*The combination of population growth, the religious movement, and the success of the East Coast college movement all contributed to rapid expansion in higher education. Admission took on the role of being a conduit for college-bound students to obtain an education* (Johnson 2000, p. 2).

The introduction of the GI Bill in 1944, the name change of the American Association of Collegiate Registrars to the American Association of Collegiate Registrars and Admissions Officers in 1949, and the establishment of The College Board in 1900, all helped shape and formalize the admissions profession. The GI Bill, which created opportunities for veterans of World War II to attend college, and the College Board’s introduction of Advanced Placement (AP) in 1953, may have had the largest impact on college admissions. The AP program, coupled with the utilization of new admissions criteria factoring in a student’s class rank, test scores, campus interviews, and recommendations, also helped bring standards to the college admission process. Unfortunately, during this period of growth and standards, college admissions officers became known as the “gate keepers” of admissions. However, just two decades, admission professionals would see the beginning of a roller coaster profession. Declining enrollments and a “tumultuous social atmosphere” changed the face of many institutions of higher education (Johnson 2000).

This new era brought with it the introduction of a new discipline of business techniques to the admissions profession. Some of the business techniques and practices utilized by admissions officers included the development of marketing plans, purchasing names of students, direct mailing, and phone campaigns. The integration of these new business principles certainly epitomized the metamorphosis of the admissions profession to the beginning stages of enrollment management. However, some researchers would argue that the term enrollment management actually began to surface during the 1980s among the student affairs professionals (Hossler 1986; Penn 1999).

Since this new theory of leadership has risen in higher education, the Strategic Enrollment Management (SEM) system continued to rapidly evolve over the past decade (Dolence 1997). Today, as enrollment management evolves, so too have the titles and positions in enrollment management. Institutions are reorganizing with the titles of vice president, vice provost, assistant provost, and dean or director of enrollment services (or management) (Becraft 1997; Penn 1999). According to *The Chronicle of Higher Education* (2000), during the academic year of 1995–1996, the chief enrollment management officer earned a median salary of $65,101. The median salary in 2002–2003 increased by more than 36 percent to $88,350. This rate of increase was higher than that of the chief academic officer position over the same period of time. This monetary gain demonstrates the importance of the enrollment management position in the eyes of presidents across the country.

**Enrollment Management or Enrollment Leadership?**

Senge (1994, p. 6) describes the five disciplines of a learning organization as:

- **Personal Mastery**—learning to expand our personal capacity to create the results we most desire, and creating an organizational environment which encourages all its members to develop themselves toward the goals and purposes they choose.
- **Mental Models**—reflecting upon, continually clarifying, and improving our internal pictures of the world, and seeing how they shape our actions and decisions.
- **Shared Vision**—building a sense of commitment in a group, by developing shared images of the future we seek to create, and the principles and guiding practices by which we hope to get together.
- **Team Learning**—transforming conversational and collective thinking skills, so that groups of people can reliably develop intelligence and ability greater than the sum of individual members’ talents.
- **Systems Thinking**—a way of thinking about, and a language for describing and understanding, the forces and interrelationships that shape the behavior of systems. This discipline helps us see how to change systems more effectively, and to act more in tune with the larger processes of the natural economic world.

In the remainder of this article, there will be an examination of the disciplines of systems thinking, mental models, shared vision, and personal mastery to determine if the enrollment management system is indeed a learning organization.

**Systems Thinking in Enrollment Management**

Systems thinking is based on system dynamics and involves “looking at the interrelatedness of forces, and seeing them as part of a common process” (Senge 1994, p. 89). A systems thinking model uses archetypes for modeling the cycles that systems go through. Senge (1994, p. 121) describes these archetypes as “accessible tools with which managers can quickly construct credible and consistent hypotheses about the governing forces of their
systems." In an enrollment management system, Hossler (1986) explains the enrollment management systems approach as:

"The enrollment management perspective emphasizes the notion of a systems approach to college enrollments, that is, an effort to systematically link all the policies and functional areas that have an impact upon student enrollments. This perspective represents an attempt to create an organizational system that encourages closer communication and cooperation among the individuals and office who have an effect upon student matriculation and student persistence. Enrollment management introduces a systems perspective and a more "tightly coupled" organizational structure in an attempt to exert greater institutional influence on college enrollments (p. 13)."

The four common enrollment models that are used in higher education are the enrollment management committee model, the enrollment management coordinator model, the enrollment management matrix model, and the enrollment management division model (Hossler 1986). Several studies on effective enrollment management systems suggest the importance of linking operational areas of admissions, financial aid, career planning, orientation, and retention activities together in order to establish effective communication and collaboration and to influence enrollments (Hossler 1986; Johnson 2000; Penn 1999). These areas are typically linked in all four models.

Hossler (1986) says that the enrollment management committee "is often the initial campus response to enrollment-related problems" (p. 41). The enrollment management committee is often comprised of key members from the faculty, the functional areas of admissions, financial aid, student affairs, and senior officers. This committee is generally charged with examining marketing, admissions, and student retention issues and problems. The problem with this model is that this committee usually does not have the power to "influence institutional policy" and that members frequently change. However, the committee can be useful as a "vehicle for educating a large group of people about enrollment-related issues...[And] these committee members can become advocates of enrollment-related issues and resources (Hossler 1986, p. 42).

Many institutions have chosen to implement the enrollment management coordinator model—particularly private colleges. In this model, the director of admission or financial aid is responsible for monitoring the enrollment activities of the campus and supervising both offices. The disadvantage of this model is similar to that of the enrollment management committee—not enough power to influence decisions or changes that are outside the functional areas of responsibility. One advantage of this model is the ability of the coordinator to oversee the activities of both offices. This coordination can lead to a more seamless process for the student. This model can be particularly effective "if the coordinator has good communications skills, is persuasive, and is well regarded in the organization" (Hossler 1986, p. 43). This model, unlike the enrollment management committee model, also makes the leader or administrator more accountable for enrollment issues.

The enrollment management matrix model "moves colleges and universities one step closer to a centralized and tightly coupled system" or toward a stronger systems thinking organization (Hossler 1986). This model frequently brings together those individual administrators who have the greatest impact on enrollments under the direction of a senior-level administrator (p. 43). This does not mean that all areas report to this senior-level administrator, but all areas recognize that this administrator has the power and influence necessary to effect change and policy. This influence is one of the major differences between the coordinator position in the enrollment management coordinator model and the administrator in a matrix model.

Finally, for a tighter system, the enrollment management division is the model that is most desired. It is the "most centralized and tightly coupled enrollment management system" (Hossler 1986, p. 44). Hossler describes the enrollment management division:

"In this model all major offices connected with enrollment management efforts are brought together directly under the administrative authority of one senior-level administrator. The advantages of such a system appeal to most administrators. Each of the principal components of the system can be both directed and coordinated by one vice president. In this model issues of cooperation, communication, and resource allocation can be dealt with from a system-wide perspective. In addition, the vice president (or dean) speaks with formal authority on enrollment issues in all policy decisions (p. 44)."

One of the few disadvantages in implementing this model is the organizational politics that can exist. In this model, offices that are traditionally in other divisions are now moved into the enrollment management division, which can create turf battles and power struggles among other senior-level staff.

The systems thinking archetypes can be very accessible in building and developing an enrollment management system model by "finding a pattern of performance that seems to sum up the behavior of your entire system" (Senge 1994, p. 122).

It's important to note that no one enrollment model applies to every institution. Colleges must first evaluate the needs of the campus and staff and examine financial resources before choosing a model that addresses their particular role and mission.

**Mental Models in Enrollment Management**

Mental models are "the images, assumptions, and stories which we carry in our minds of ourselves, other people, institutions, and every aspect of the world" (Senge 1994, p. 233). These mental models can "distort our vision" and keep us from moving forward as an organization or as individuals.

As enrollment management and executive teams are being formed and our campuses are becoming more diverse (i.e., staff, faculty, and students), there is greater need to change many of our mental models about race, class, and gender issues.

Bensimon and Neumann (1993) examined executive teams and discussed the importance of effective leadership teams. They indicated that effective teams are team-oriented and that they practice inclusion and welcome, appreciate, and seek each team member's opinion and viewpoint. This is particularly important.
in bringing diversity to the table of discussion. These often-unheard voices belong to women, people of color, and people of different sexual orientations within the organization (Bensimon and Neumann 1993).

Kalsbeek (1997), in explaining the types of politics in enrollment management and mental models, wrote:

The types of decisions and actions we pursue in enrollment management can be viewed in many different ways from different perspectives. We “frame the debate” by how we define the salient issues at stake, set the agenda for considering options, and pose the questions to be answered. All of this is a way of influencing the outcome.

While an enrollment management perspective may be new to a given campus, all decisions about recruitment and retention strategies inevitably unfold within history, within a rich context of prior commitments and past choices that color or frame the way everyone appraises the present situation and evaluates options for future action…Being new to a campus can free one from the blinders of historical precedent and more easily allows decisions to be reframed; but successfully getting things done also requires understanding the historical context that frames enrollment issues for those who have been around for some time (p. 159).

Therefore, as Senge (1994) and Kalsbeek (1997) say, we (enrollment managers) need to be “more skilled” at identifying the assumptions and mental models that effect positive change in our organizations. For example, “how financial aid strategies are evolving on many campuses illustrates the power of how assumptions and mental models frame decisions and determine new courses of action” (Kalsbeek 1997, p. 160). Previously, colleges and universities thought of financial aid simply as a “budgeted expense”; now enrollment managers have helped college leaders to understand a new system of “leveraging and discounting” as a new way of doing business.

**Shared Vision in Enrollment Management**

The discipline of building a shared vision “is centered around a never-ending process, whereby people in an organization articulate their common stories—around vision, purpose, values, why their work matters, and how it fits in the larger world” (Senge 1994, p. 298). This vision is focused around “building shared meaning” among an organization’s values, goals, and sense of purpose.

Building a shared vision and working on mental models within an enrollment management system are key ingredients necessary to move individuals, departments, and the teams toward the enrollment, graduation, and retention goals of an institution. In discussing how to get things done in an organization of politics, Kalsbeek (1997) wrote:

An organization with a shared vision and common goals is an increasingly popular prescription for getting things done in organizations. Building a strong climate and culture in support of certain goals certainly can relieve an organization from depending on authoritative hierarchy for direction. But in our complex academic environments with extremely diverse “cultures” among faculty, student affairs staff, and students, and with our many widely divergent goals, it may be unrealistic to rely on a “shared vision” to mobilize the type of synchronized, synergized, and comprehensive effort required to achieve strategic enrollment goals” (p. 152).

Getting things done requires individuals and organizations to understand the “sources and patterns of influence in the organizations. A ‘tree-diagram’ is the way we typically think about how our organizations are designed and structured; it is our mental map of the arena in which we work (p. 154).

In an effort to bring together the shared vision of an enrollment management organization’s team, Penn (1999) wrote: At its best, enrollment management creates a highly interactive team of committed staff and faculty that uses established principles of planning, implementation, evaluation, and revision to ensure the institution’s constant and consistent success in meeting the educational commitments to students while remaining accountable to its many publics (p. 7).

In order for the enrollment leaders to be effective in today’s higher education environment, leaders must:

…learn to communicate clearly and directly—in writing, speaking, listening, and observing and through the professional image they present. How a leader communicates an attitude and vision will set the pace and tone in the workplace, which, in turn, inspires, motivates, and obtains significant (often extraordinary) results from people and builds powerful, productive teams (Weese 1997, p. 33).

**Personal Mastery in Enrollment Management**

Personal mastery may be the most important discipline of the five disciplines of becoming a learning organization. The “central practice of personal mastery involves learning to keep both a personal vision and a clear picture of current reality before us” (Senge 1994, p. 195).

In Penn’s qualitative study on issues around enrollment management in the 21st century (1999), college administrators were asked to provide advice to newcomers to enrollment management. Every institution suggested that novice enrollment managers must have clear goals and stay focused on students. Students’ success can happen only if the institution’s leadership is committed to students…and efforts will succeed if the president is committed to the program and endorses a student-centered focus…” (Senge 1994, pp. 21–23).

In a review of the literature, several studies provided a list of skills and traits needed for enrollment professionals (Becraft 1997; Kalsbeek 1997; Penn 1999; Sprotte 1997; Swanson 1997; Swanson and Weese 1997; Weese 1997; Williams and Zenger 1997). Swann, as cited in Johnson (2000), listed several basic skills needed for today’s enrollment professionals:

- Ability to analyze and make solid decisions.
- Ability to maintain balance or centeredness.
- Dedication to purpose and mission.
- Endless energy for erratic hours.
- Friendly attitude with proclivity for outreach and conversation.
- An innate capacity for public relations.
Keen self-discipline and mastery of motivating techniques (p. 3).

Possessing these skills ensures that enrollment professionals have the ability to work with staff, guidance counselors, and students. Some of the above skills can be gained by attending professional association meetings and on-going professional development.

Leaders of enrollment management must also understand the difference between leading the organization and managing the organization. Bennis and Goldsmith (1997, p. 4), say that a “good manager does things right. A leader does the right things.”

Williams and Zenger (1997) gave a blueprint for the type of traits and characteristics necessary for enrollment leaders:

Leaders are confident and optimistic about the future. They realize that there is one thing certain in life, and that is change. In order to be successful, members of the team will need to embrace and celebrate opportunities for change and growth. As a leader, you will need to initiate change, set the pace, and constantly be showing others the importance of change (p. 102).

Conclusion and Recommendations

As today’s literature suggests, enrollment management professionals should expect one constant—more change in the future of enrollment management and higher education. Enrollment leaders must continue to work on mental models of their organization in preparing their staffs and campuses for the changing demographics of students as the nation’s population gets older, more ethnically diverse, and as the number of women continues to outpace men in college enrollment.

After a review of the literature, I believe a strong argument can be made that the concepts of a learning organization are readily applicable to enrollment management. While there has been some research on the area of enrollment management, additional studies need to be done to help further the understanding of this profession and to examine more closely the successful enrollment models in education by type of institution including research, teaching, and liberal arts institutions.

References


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Electronic Tools For International Admissions
Part III: Have You Hugged Your Computer Today?

(All URLs are accurate as of April 10, 2003. An electronic copy of this article may be
requested from the author at koeniga@aacrao.org.)

This final segment of our series on Internet resources for international admissions is based on a presentation given by the author at the 2003 AACRAO Annual Meeting. It is a compilation of Web pages and links meant to guide an international admissions professional entering the field, or one who is new to using the Internet as a research tool. Exploring these URLs while practicing the “five tips for using the Internet as a research tool” that were presented in Part I of this series (see the Fall 2002 C&U, Vol. 78, No. 2), can open up a new world of accurate, timely, and reliable Internet-based information.

“Computers don’t always do what you want them to do; they do whatever you tell them to do.” Ever heard this saying? It reflects the reality that a computer, despite its sophistication and “personality,” is still just a machine responding to your commands. Instead of wanting to “punish” your computer when it “does something wrong” (i.e., when you have told it to do something you really didn’t want it to do), try linking to the Web pages below and experience a feeling of success and “oneness” with your computer! When your Internet searches lead you to a long-sought After Ministry of Education Web site, link you to an overseas colleague, uncover that illusive foreign university grading scale, or present new ideas for international recruiting—give your computer a great big hug!

Internet Tutorials

UC Berkeley Teaching Library Internet Workshops: This tutorial covers topics such as things to know before you start a search, strategies for searching and types of searches you can conduct, and how to evaluate the Web site or information you have found. Also check your own institution’s library or your local public library for more information and training on using the Internet as a research tool.

AACRAO Resources

AACRAO International Education Services Web page—This site includes links to international education services offered by AACRAO, SEVIS issues and responses, the International Student Bill of Rights, AACRAO’s international publications catalog and publication ordering information, and AACRAO’s Foreign Education Credential Evaluation service.

AACRAO Resource Center: Here AACRAO members can read and download conference presentation summaries and handouts from AACRAO conferences, plus articles by AACRAO’s International Education Services staff from the quarterly C&U journal. Search under “International Education.”

NAFSA: Association of International Educators Resources

ADSEC (Admissions Section) Web site: Use pull-down menus to access resources on principles of good practice for international recruiting and admissions, OSEAS connections and country information, resources for recruiting, the ADSEC Bibliography 2000, and Internet Resources for Admission.

EAIE: European Association For International Education Resources

ACE (Admissions Officers and Credential Evaluators) Links Web page: The EAIE section for admissions professionals and credential evaluators offers useful links, especially in a European context.
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U.S. Department of State: Affiliated Overseas Educational Advising Centers
http://exchanges.state.gov/education/educationusa/centers.htm

How to Reach OSEAS Advisors Around the World:
www.oseas.nafsa.org/howtoreach.asp

Ministry of Education Links
Ministries of Education: UNESCO Web site of ministries of education, including contact information and e-mail and Web links to ministries.
www.unesco.org/education/partners/mined/mined.htm

Governments on the Web: Link from Worldwide Governments on the Web to each country, then to government agencies within each country, including governmental education authorities.

Country/Regional Resource Links: Updates And Additions
These urls are some updates and additions to the resources found on the NAFSA Adsec International Resources for Admissions Web page (www.adsec.nafsa.org/inetresources.asp).

MULTI-COUNTRY RESOURCES

World Higher Education Database: Profiles of education in 175 countries, arranged by country, which include information on the structure of the educational system, types of institutions, names of credentials, academic year, language(s) of instruction, grading system(s), educational authorities, information for international students wishing to study in that country. Co-sponsored by the International Association of Universities and UNESCO.
www.unesco.org/iau/whed.html

Credential Evaluation on a Shoestring: Links page established by Jason Vorderstrasse, former international education professional at Golden Gate University, listing many great resources, country-by-country.
http://shoestring.www6.50megs.com

DIPF Databases Direct: Information on National Education Systems. Database compiled in Germany; this link is to the English version.
www.dipf.de/datenbanken/ines_e.htm

UCAS (Universities and Colleges Admissions Service) of the United Kingdom International Qualifications page: Country-by-country information on qualifications required for admission to higher education in the United Kingdom. The Introduction section is valuable. Note that comparability statements are based on UK comparability. Appendix G includes contact information for many organizations.
www.ucas.com/candq/international/index.html

AFRICA

Africa Education:
www.africaeducation.org/

Association of African Universities:
www.aau.org/

ARAB WORLD

Association of Arab Universities:
www.aaru.edu.jo/

Arab.net: General links country-by-country, including education.
www.arab.net

ASIA

Southeast Asian Ministers of Education Organization: Links to profiles of higher education in 10 countries of Southeast Asia (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam), plus associate member countries (Australia, Canada, France, Germany, the Netherlands, and New Zealand).
www.rihed.seameo.org/H_E_System/h_e_system.html

Australian NOOSR Online publication on education in Singapore:

AUSTRALIA

Australian NOOSR Online publication on education in Australia:

CARIBBEAN

Caribbean Education (from Google search engine):
http://directory.google.com/Top/Regional/Caribbean/Education

Caribbean Examinations Council:
www.cxc.org

EUROPE

ENIC-NARIC Network: A joint initiative of the European Commission, Council of Europe, and UNESCO/CEPES, includes links to the national information and recognition centers of approx. 50 countries.
www.enic-naric.net

EURYDICE Eurybase 2001: Online database of 50 countries (the 15 Member States of the European Commission, the three EFTA/EEA countries, ten central and eastern European countries, Malta and Cyprus), includes descriptive and statistical information on education in English and the native language, for most countries.
www.eurydice.org/Eurybase/Application/eurybase.htm

A Guide to Higher Education Systems and Qualifications in the EU and EEA Countries: Second edition of this online publication including educational systems of 18 European
countries, and a directory of NARIC offices. General overview of each country’s system.


- **South East European Educational Cooperation Network:** Includes links to information on educational systems in Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Yugoslavia, Macedonia, Moldova, Romania and Slovenia.
  - www.see-educoop.net/

- **Germany—Australian NOOSR Online publication (1992):**

**LATIN AMERICA**

- **Education in Latin America:**
  - http://lanic.utexas.edu/subject/education/

- **Higher Education in Latin America:**
  - http://lanic.utexas.edu/la/region/highered/

**Links to Educational Institutions**

- **Braintrack University Index:** Over 5500 Links to higher education institutions in 161 countries.
  - www.braintrack.com

- **College and University Home Pages:**

- **General Education Online:** Links by country to information and institutions.
  - www.findaschool.org

- **The Higher Education Institution Registry:** A searchable database of institutions around the world.
  - www.siu.no/inst.nsf/searchform

- **Universities Worldwide:** Searchable database by country, compiled by the University of Innsbruck, Austria.
  - http://geowww.uibk.ac.at/univ
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