Pest Testing Consumer Behavior in Higher Education: A Perceptual Identity Audit with Bite

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ABSTRACT

A basic understanding of an institution’s public perception is a critical first step in the development of a marketing campaign. This research examines the relationship between the percentage of below average ACT scores received by a university and six salient attributes. A perceptual identity audit, the PEST test, illustrates four distinctive university profiles — Prestigious, Educational, Social, and Technical. A prediction formula is provided that can be used to help administrators perform an institutional perceptual identity audit.

INTRODUCTION

University administrators realize that they are in a competitive marketplace. This intense competition requires institutions of higher education to develop and nurture their brand image and market position. Historically, it was common for universities to pre-select those students scoring within a specified range on standardized tests when mailing solicitations. Admission teams were dispatched to geographic areas where prospecting students appeared the most warranted. There has been no significant change in this philosophy. However, Comm and LaBay (1996) have urged university officials to embrace the concept of quality as a marketing tool. Implicit in their plea is the “biting” truth that students are now pre-selecting and evaluating universities.

BACKGROUND

Selling Quality — Web Sources

Assessing university performance or quality is not difficult for the public to define or measure. A visit to the World Wide Web will “net” an impressive number of sites offering their independent evaluation of colleges and universities. For example, www.gocollege.com allows the college bound student to match their test results and other variables to appropriate schools and www.memex-press.com/cc/ exhibits the “Critical Comparisons of American Colleges & Universities,” which champions an objective philosophy for evaluating university systems. These are two of the more common, although not widely accepted Web sites that can be used to evaluate institutions of higher education.

Selling Quality — Commercial Sources

Barron’s offers the Profiles of American Colleges and boasts that they are the number one choice among students for college information. The U.S. News & World Report rating system of the top colleges and universities is the most highly publicized, read, and cited ranking system available to the general public. Peterson’s guide is endorsed by the National Association for College Admission Counselors and touts an exclusive system for rating colleges. The public sector is selling quality, or at least the concept of assessing quality.

Selling Quality — Institutional Response

The University of Illinois at Urbana-Champaign maintains a guide to college and university rankings through their “Education and Social Science Library” via the Web at http://www.library.uiuc.edu/ed/s/rankings.htm. This Library in no way constitutes an endorsement of any ranking and tenders cautionary caveats regarding the controversy of rankings. Moreover, many authors and university administrators have criticized the system of college rankings. Wright (1992) criticizes U.S. News and World Report and Money Magazine for their college rankings, stressing meaningless data and poor methodology. Similarly, Carter (1998) reported that some deans were so fed up with law school ratings provided by U.S. News & World Report that they launched an anti-ranking
campaign.

Paradoxically, although many institutions attack rating systems, some aggressively use the rankings for marketing and promotion purposes (Machung 1998). This is even more ironic, given that according to some researchers, all guidebook and rating systems have a small to negligible impact on students considering college (Hossler and Foley 1995). In summary, Graham and Diamond (1999) probably characterized the ranking game best when they asserted that there is something unseemly and petty in the spectacle of academics squabbling over whose department or program is higher in the pecking order. The key issue appears not to be the reality of the evaluation but rather, the perception it conveys.

**Perception and Marketing**

Perception influences most thoughts and behaviors for the student prospect. In fact, Pan and Baker (1998) referred to perception as a fundamental feature of all human behavior. Green, Carmone, and Smith (1989) theorized that consumers invariably render perceptual judgments about the benefit and cost of all products or services. Thus, the assumption that prospective students make decisions based on their perception of university quality is a valid one. Recall Conn and LaBay’s (1996) assertion that any institution holds a distinctive perceptual position in the mind of any customer or prospect. Moreover, the perceptual image may not reflect the actual physical or functional characteristics of the product or service (Dillon, Domzal, and Madden 1986). Hence, the prospective student’s view of an institution may not necessarily be the reality of the situation.

**Perception and Brand Position**

Rodney W. Underhill (1999) states that brand image is the most important asset an organization can build and maintain. A brand is a “promise” conveyed by all activities performed by the brand stewards in the organization. The brand image is therefore strengthened or weakened at every point of contact. In higher education this translates to brochures, catalogues, Web sites, tours, admission representatives, and any video, press releases, or independent evaluation services publicly available. It is generally accepted by researchers in advertising (Dilllon, Domzal, and Madden 1986) that brand deliberation may be based on beliefs that are derived from exposure to advertising and other types of communication. Hence, it becomes critical that institutions of higher education know their public image and perceived position in the marketplace.

**RESEARCH QUESTIONS**

Given this brief overview of consumer perception, brand image, and positioning strategy, five research questions investigated an objective system for institutional profiling. Specifically, the purpose of this study was to determine how institutions of higher education are perceived by the general public. The questions are as follows:

1. How stable are the perceptions of colleges and universities among prospective students over time?

2. What is the relationship between the public perception of academic effort needed to attend a desired college and the actual academic profile of those accepted?

3. What is the relationship between salient attributes and the percentage of below average ACT scores received by an institution in terms of public image?

4. Can a college be perceived as a specific type of institution?

5. Can a perceptual identity audit be conducted using only the percentage of below average ACT scores received by an institution?

**DEFINING THE CONSTRUCTS**

Since public images tend to be gradually perceived and identities quickly observed (Selame and Selame 1988), the first question examined the stability of university perception. Stability was measured by examining the relationship between the percentage of below average ACT scores (i.e., <22) received by 50 institutions of higher education in Ohio over a five-year interval. Hence, a correlation matrix examined all statistical relationships.

Question two examined the relationship between perception and reality. In essence, the closeness of the relationship between student perception of academic effort needed to attend the university and the reality of being accepted was tested. Statistical regression allowed the researchers to examine the amount of variance that the percentage of below average ACT
scores received could account for when predicting a cumulative ACT score. For clarification, the cumulative ACT score accepted is simply the average of all ACT scores that define the enrolled student population.

Question three investigated a point stressed by Conn and LaBay (1996) that a college must understand its salient attributes. The goal was to determine whether a perceptual discrepancy between marketers and prospects existed in relationship to university descriptors. Simple regression tested the relationship among the percentage of below-average ACT scores received and six individual attributes. These attributes were quantitative and included the following: 1) graduation rate; 2) freshman retention; 3) alumni giving; 4) off-campus living; 5) in-state student population; and 6) generational/legacy status of the current student population. A second part of this question clustered qualitative features derived from various printed materials to be used for descriptive purposes.

Question four addressed the observation that marketers and prospects may have different perceptions of needs and wants (Fodness 1990) and as such, marketers can greatly influence the prospect's decision on which vendor to patronize (Pamitz 1988). The question becomes, can a university be classified as a certain type of university? This concept is recognized as an important component of any marketing strategy (Hauser and Simmie 1981). In determining an answer to this question, the salient attributes were interpreted in narrative form, according to the significant statistical relationships discovered in answering the third question. In addition, qualitative findings were described according to a rank-order position, corresponding to the percentage of below-average ACT scores received by the 50 institutions over the five-year interval (see Methodology).

And finally, the fifth question explored if a practical self-evaluation of student perception could be completed without public display or institutional outcry. The goal was to define both the market segment and perceptual space that an institution occupies. This process entailed performing statistical regression between the assigned rank-orders (see Methodology) and the percentage of below-average ACT scores received by institutions.

METHODOLOGY

Since ease of use and practicality were the primary goals of this research, a decision to examine the perceptual implications of standardized testing in relationship to where a student decides to send their ACT scores was examined. Specifically, where does a student in Ohio send their ACT scores? Ohio was chosen for five reasons: the availability of data extending from 1994 through 1998; Ohio has a broad-based educational system; a report of the top 50 schools receiving ACT scores from Ohio students is available from the American College Testing Program; the results can be generalized within reason; and the ACT score appears to be an effective predictor of college success and is an indicator of generic abilities and motivation (Becker and Fischer 1999).

The following predictor variables were used because of their ubiquitous nature and general ease in obtaining data: graduation rates, freshmen retention, alumni giving rate, percentage of students living off-campus, percentage of students in state, and the generational status of students enrolled. These quantitative attributes were collected and sorted from commonly available commercial reference sources like Barron's, Peterson's, U.S. News & World Report, and various Web sites. In a qualitative examination, public brochures, pamphlets, and catalogues were examined for social descriptors.

Using the percentage of below average ACT scores received by an institution to determine perception was heuristic. Since the proverbial weakest link breaks the chain -- the percentage of below average ACT scores received by an institution should define public perception. Also, research protocol dictated that the below average ACT scores would be rank-ordered according to frequency. Specifically, the percentage of below average ACT scores (i.e., < 22) sent to the students' selected universities were listed and assigned a rank score of 1, 2, 3, or 4. A score of 1 reflected that this university grouping had received the lowest percentage of below average ACT scores with more than one standard deviation in difference. Scores of 2 or 3 represented a half standard deviation on either side of the mean. The score of 4 represented those institutions with the highest percentage of below average ACT scores received — more than one standard deviation from the mean.

RESEARCH FINDINGS

Five questions were posed. The first question examined the consistency of student (i.e., public) perception over a five-year interval. The correlation matrix in Table 1 represents the percentage of below
Table 1
Correlation Matrix
(Five Year Interval)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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<td>1994</td>
<td>1</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>1995</td>
<td>.992*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>1996</td>
<td>.985*</td>
<td>.991*</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>.987*</td>
<td>.992*</td>
<td>.991*</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1998</td>
<td>.986*</td>
<td>.989*</td>
<td>.992*</td>
<td>.996*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5 Year</td>
<td>.994*</td>
<td>.997*</td>
<td>.996*</td>
<td>.997*</td>
<td>.996*</td>
<td>1</td>
</tr>
</tbody>
</table>

Note: *p<.05

Table 2
Below Average ACT Scores:
Relationship to Salient Attributes

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>R</th>
<th>R-squared</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduation Rate</td>
<td>42</td>
<td>.83</td>
<td>.69</td>
<td>.0001*</td>
</tr>
<tr>
<td>Retention</td>
<td>40</td>
<td>.86</td>
<td>.75</td>
<td>.0001*</td>
</tr>
<tr>
<td>Alumni Giving</td>
<td>39</td>
<td>.56</td>
<td>.31</td>
<td>.0002*</td>
</tr>
<tr>
<td>Off-Campus Living</td>
<td>38</td>
<td>.46</td>
<td>.21</td>
<td>.0027*</td>
</tr>
<tr>
<td>In-State Students</td>
<td>38</td>
<td>.61</td>
<td>.37</td>
<td>.0001*</td>
</tr>
<tr>
<td>Generation/Legacy</td>
<td>49</td>
<td>.79</td>
<td>.63</td>
<td>.0001*</td>
</tr>
</tbody>
</table>

Note: *p<.05; the observed change in degrees of freedom across testing was due to the inability to obtain data, or a refusal on the part of the institution to release data.

average ACT scores received by 50 institutions during the 1994-1998 time interval. Six were missing since not all 50 universities were classified in the top 50 over 5 years in terms of percentage of below average ACT scores received. The variable named “5 Year” was a composite average extending from 1994-1998.

Question two examined the relationship between the perception of academic effort needed to attend any particular university with the reality of being accepted. Findings were statistically significant (F, 1/49=274.7, p<.0001; R=-.92, r-square=.85).

Question three examined six salient attributes and their relationship to the percentage of below average ACT scores received by any institution. An overview of the findings is in Table 2.

A seventh attribute was qualitatively determined by clustering findings and matching group assignment. Four distinctive areas were found that highlight university promotional efforts. These areas listed in ascending order were: professional development, graduate school preparation, social life, and job placement. For clarification, they corresponded proportionally to the 5-year cumulative percentages of below average ACT scores received.

Question four examined the feasibility of clustering findings into a classification system that facilitates an identity audit. Table 3 presents in narrative form the combined quantitative and qualitative findings. The acronym PEST highlights the results.

The fifth question examined the feasibility of conducting a non-public identity audit. The question addressed the statistical relationship between variable 5 YEAR and the derived rank-order. Significance was found (F, 1/49=441.1, p<.0001; R= 95, r-square=.90). The formula for deriving an institutional identity audit is found in Table 4. By function, it becomes the PEST test.

For example, if an institution has 58.0% of its total received ACT scores designated as below average, the institution would have the perceptual classification of a Social Institution with a numerical value of 2.8 (see
Table 3
INSTITUTIONAL PEST CLASSIFICATION
Perceptual Identity Audit

Prestigious Institution
(0-1)
Classified as most selective, extremely competitive or elite. Students have the highest ACT scores. There is a tendency to promote their long, distinguished history of producing world leaders and known public figures. There is a large proportion of out-of-state or international students and 4-year graduation rates are the highest. Freshmen retention rates are well above other universities. Also, legacies within the institution are common and alumni giving rates are the highest of the four PEST classifications. Most of the students live on campus.

Educational Institution
(1-2)
Classified as selective or very competitive. Students exhibit high ability as measured by ACT scores and universities tend to promote the academic success of their students in terms of entering graduate programs, law, or medical school. Academic scholarship is stressed. There is a large number of out-of-state students and 4-year graduation rates are high. Freshmen retention rates are higher than most, but lower than Prestigious universities. Students tend to come from an educated family background with relatives attending comparable institutions of higher education. Second generation students is the norm. More of the students tend to live on campus.

Social Institution
(2-3)*
Classified as competitive or less competitive institutions. Students exhibit a wide range of academic ability as measured by their ACT scores. There is a tendency to promote individual student need while highlighting student strength and potential. Student life or experience appears to be a major focus, promoting resident life, recreation centers, safety, good food, etc. A significant proportion of out-of-state students, as well as an international program are present, but the student population is primarily in-state and regional in scope. The mix of first and second generation students appears to be equal. Living on campus is common.

Technical Institution
(3-4)
Classified as open or noncompetitive, and may be designated as a special, two-year trade, or community college. It is not uncommon to find a four year liberal arts college; however, as a group they have students that have scored significantly lower on the ACT. Getting a job or starting a career appears to be the major institutional focus. The number of out-of-state or international students is low and most of the student body is from local districts. First generation students is the norm. Living off-campus is the general rule.

Note. PEST classifications combined all significant qualitative and quantitative findings.
* Numerical range defines institution classification (refer to Table 4).

Table 4
PEST TEST
Perceptual Identity Audit

PEST (classification) = .05 multiplied by (the percentage of below average ACT scores received) minus [.10 ].

Note. The resulting score represents a categorical classification. A Prestigious Institution scores between 0 and 1; the Educational Institution scores between 1 and 2; a Social Institution scores between 2 and 3; the Technical Institution scores between 3 and 4 (see Table 3).
DISCUSSION AND IMPLICATIONS

Table 1 illustrates that students' university perceptions are consistent for the five years under investigation. There is little perceptual shift at the aggregate level. Data suggest that university perceptions are well established and known to the general public, thus providing the foundation for establishing a reliable and valid rank-order of perceptual characteristics. One implication of this finding is that any attempt to change the institutional image over night may not be warranted. However, there is an ability to benchmark perception in relationship to a population of universities.

The second question found that the relationship between public perception and reality is a close one. Results that as the proportion of below average ACT scores received increases, the cumulative ACT score of those enrolled decreases. Hence, if your institution receives a low percentage of below average ACT scores, your university cumulative ACT score is probably high. The implication is twofold. First, the public is aware of academic effort needed to attend your university and second, making academic claims beyond or below your perceived level of academic competence may cause dissonance. However, dissonance could be a positive indicator, if an institution is attempting to shift or modify perceptual position.

The third question found that six university attributes are related to the proportion of below average ACT scores received. Findings suggest that as the percentage of below average ACT scores increases, graduation rates, freshmen retention, generational status and alumni giving decreases. However, as the percentage of below average ACT scores decreases, so do the number of students living off-campus and the proportion of students attending from in-state. Qualitatively, a seventh attribute indicates a proportional relationship between institutional classification and four distinctive areas. Specifically, professional development, graduate school preparation, social involvement, and job placement corresponded proportionally to the 5 year cumulative percentage of below average ACT scores received. In practice, these qualitative findings suggest an institution’s perceptual mission. Since statistical relationships were found, any attempt to shift a university’s perceptual position can begin with these seven attributes.

The fourth question illustrates that colleges can indeed be clustered into perceptual classifications. The acronym PEST classifies institutions as Prestigious, Educational, Social, or Technical. Although few institutions actually use these classifications, they are intuitively appealing. As a caution, these classifications are not to be interpreted as a "best colleges" list but merely as a classification scheme. There are no high or low ranked universities and there are no winners or losers. Commercial and academic services often rank universities according to tiers, divisions, or levels, making a practical interpretation difficult. However, these findings provide a foundation for determining a perceptual identity. The implication is that prospective students do not classify universities and quality indicators according to academic tiers; an institution is merely "good, bad, or ugly" at providing what the prospect expects it to provide.

The fifth question culminates earlier findings when inserting university data into a formula provided in Table 4. An institution can now obtain a perceptual identity audit without public fanfare. The PEST test allows university officials to examine public perception, track on-going trends, and accurately benchmark against true competitors in terms of public perception. One major implication of this finding is that it permits an institution the chance to examine public perception in terms of institutional congruence. This is important because it allows a university to examine its mission statement, and it questions if the university knows itself well enough to develop and deliver an effective marketing campaign.

CONCLUSION

These research findings must be reviewed and interpreted with caution. First, this study used data obtained over a five year interval for university systems in Ohio. Although Ohio is fairly representative of other states in terms of having a full range of educational opportunities for its citizenry, it is still not Texas, Oklahoma, Florida or Michigan. It could also be argued that the methodology and statistical analysis of the key variables used to address the issues of concern were not sufficiently sophisticated. Therefore, further research using a larger data base, additional variables, and advanced statistical techniques (i.e., factor analysis) would enhance the findings and minimize harsh criticism. In addition, developing cut-scores to determine when a perceptual shift has occurred would complement the body of professional literature.

In conclusion, the findings suggested that not
only are university perceptions known to the general public, but they are also stable over a five year interval. Also, it was found that the relationship between the student perception of academic effort needed to attend a university was directly related to the cumulative ACT score of enrolled students. All significant statistical findings were discussed and implications explored when investigating the relationship between the percentage of below average ACT scores received by an institution of higher education and the attributes that define an institution. Moreover, in conceptual groupings, the PEST test highlighted four general classifications that an institution could obtain — Prestigious, Educational, Social or Technical — and a prediction formula was offered that allowed a university to self administer an identity audit.

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