Features

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Mathematics Placement Tests and Gender Bias
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Features

3 Recruiting Urban and Rural Students: Factors Influencing the Postsecondary Education Institution Choices of Rural Versus Urban High School Students
Timothy D. Hodges and John E. Barbuto, Jr. offer a comparison of rural and urban high school students and the factors that influence their choices for higher education.

11 A Study of the Effect of the Implementation of the Plus/Minus Grading System on Graduate Student Grades
This study, conducted by Bobby G. Malone, Jacquelyn S. Nelson, and C. Van Nelson analyzed grades for master’s level graduate students to see if there were differences in grading patterns between the ‘A-F’ grading system and the plus/minus system.

23 An Evaluation of a College of Education Graduate Admissions Process: A Non-registrant Perspective
An analysis was conducted by Kevin J. O’Neill, Catherine C. George, Victor L. Willson, Troy G. Couvville, Jennifer L. McGee, Alfred J. Amado, Jesus Tanguma, and David L. Walker to determine why 30 percent of students admitted to graduate programs in Texas A&M’s College of Education did not register.

27 Mathematics Placement Tests and Gender Bias
Celine D’Souza Dorner and Ivan Hutton examine whether a mathematics placement system accurately predicted success in mathematics classes for both genders at a Northwest university.

The Forum
Readers’ perspectives through Q&A, guest commentary, letters, and book reviews.

33 Policy Analysis
39 International Resources
49 Commentary
52 Book Review

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Editor’s Note

As I sit in my office, as usual well past the 5:00 hour, and watch the sun’s light across the mountains, I am thoughtful of the times in which we live and contributions we make as professionals in the lives of so many students. Although we never see the faces of many of these students, decisions we make in the administration of recruitment, admissions, registration, and financial aid empower students to reach their educational goals and make positive choices about their future. Articles published in C&U often serve as reminders of the roadblocks students encounter, decisions they must make, and methods by which we can contribute to positive outcomes. It may not be a lucrative profession, but it is a rewarding one.

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The C&U Advisory Committee welcomes manuscripts for publication in College & University, AACRAO’s scholarly research journal. AACRAO members are especially encouraged to submit articles pertaining to their own experiences with emerging issues or innovative practices within the profession.

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Assistant Vice Chancellor for Enrollment Services
5203 Cheadle Hall
University of California
Santa Barbara, CA 93106
phone: (805) 893-3651; fax: (805) 893-3640
e-mail: huff-b@sa.ucsb.edu

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AACRAO
One Dupont Circle, NW
Suite 520
Washington, DC 20036
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e-mail: burkis@aacrao.org

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This review may take as long as three months, after which the C&U editor will inform the author of the manuscript’s acceptance or rejection.

Manuscript Preparation

Manuscripts for feature articles should be no longer than 4,500 words. Manuscripts for guest commentary and book reviews should not exceed 2,000 words. Letters to the editor will ordinarily be limited to 200 words.

All submissions must be saved to an IBM-compatible disk (Microsoft Word, preferably) and include a hard-copy original printed on 8.5” x 11” white paper. Because the Committee has a blind review policy, the author’s name should not appear on any text page. A cover sheet should include the title of the manuscript, author’s name, address, phone and fax number, and e-mail address.

References should be formatted in the author-date style and follow guidelines provided on page 526 of The Chicago Manual of Style, 14th edition. A list of references should appear at the end of the article. Text citations also follow the author-date format; examples may be found on page 641 of the Manual. For more information or for samples, please contact the C&U editor.

In addition to being placed in the manuscript, the data for essential tables and charts should also be included in a separate Microsoft Excel (spreadsheet) file.

All submissions are accepted for publication with the understanding that the College & University editors reserve the right to edit for clarity and style. Please do not submit articles that are under consideration for publication by another periodical.

Authors whose manuscripts are selected for publication will be asked to submit a short biographical statement and an abstract of their article, each no more than thirty-five words.
Each year, hundreds of colleges and universities spend millions of dollars on recruiting high school students to attend selected postsecondary institutions. In recent years there has been a push, primarily by land-grant universities, to tap into the out-of-state student population. The rationale for doing this is twofold. First, the out-of-state students pay higher tuition rates than the in-state students, offering a financial boost to the institution. Secondly, by bringing in students from outside the state’s borders, the institution’s diversity is enhanced.

Many institutions are spending money to recruit these students to fill their classrooms. However, little effort is made to individualize the recruitment process. Instead, a more generalized approach is used as an economical way to contact more students. This method is often viewed as impersonal. Students comment that they feel more like a number than an individual. With this in mind, and realizing that students are not the same, using a more individualized approach has proven to be effective for many schools (Kuras 1997).

Because recruitment and admissions are hot buttons for many postsecondary institutions, it is important that the most effective methods are used. One difference that may impact students’ needs is the setting in which they were raised. This study offers a comparison of students from rural and urban upbringings, and determines how their needs may be different.

**Recruiting Strategies in the Field: Some Background**

Because student recruitment is such a pressing issue for colleges and universities, a fair amount of research has been done in the area. Gose (1997a) looked at concerns over decreases in postsecondary enrollment and reported that private universities and colleges have suffered a drop in applications during the 1996-97 school year, in part because more applicants were opting for early admissions programs. These early admissions programs force applicants to commit to one institution earlier, thus limiting the number of college applications. Highly regarded public universities in Texas and California have experienced a sharp decline in applications from minority students, in part because of new and proposed legislation to adopt policies that abolish affirmative action admission programs. Filling seats is a pressing need for an increasing number of postsecondary institutions.

This poses some questions. How will these institutions fill their empty seats in classrooms? Are there certain groups of students that should be targeted? How can colleges and universities give these groups what they want? Gose (1998) describes how Temple University, a private institution, is recruiting aggressively in the suburbs. Temple University research shows that suburban students are better prepared academically and are more likely to live on campus, stay in school, and graduate. The University has decided to lure suburbanites by adding new buildings to the North Philadelphia campus. Temple hopes that the appeal of the new buildings will be attractive to this highly desired group of students.

Some colleges, such as the University of Detroit-Mercy, employ more personal contact of students from university officials to boost enrollment. Kuras (1997) discusses the plan that the University of Detroit-Mercy created to increase its enrollment rate. Dr. Robert E. Johnson, Dean of Enrollment Management, evaluated the correspondence system and developed a newer and more effective system. He used personalized correspondence to be distributed to those who contacted the admissions office. This initiative is thought to have caused the enrollment in the freshman class to increase nearly 25 percent.
With the use of Orbit Enterprises’ RAS file (the new software package), each letter was “signed” by university staff members to show a more personalized touch.

Other such tactics are also being used to recruit talented students. For example, Gose (1997b) opens up to the issue of “putting a face” on student recruitment. Some colleges are using area representatives (admissions representatives who often live far away from campus) to attract applicants from new areas. Colleges without national name recognition establish admissions representatives to build relationships with students who would not have otherwise considered that school. The strategy is showing signs of success. This plan does not save the college much money, but it increases student diversity and recruiter productivity.

Even larger schools with name recognition have placed recruiters off-site. The host university in this study is finishing its pilot year with off-site recruiters. Markets with strong potential are made known by the presence of a strong alumni chapter and substantial numbers of applicants from the area. The host university off-site recruitment venture is being piloted in Kansas City, Chicago, Denver, and Los Angeles (Stelzer 1999). If successful, the host university has considered plans to extend its efforts to other metropolitan areas such as Minneapolis, Atlanta, and Dallas within the next few years.

Are there other players in the college search process? Parents, peers, and counselors have been discussed as major players in a student's decision of where to attend college. Parents are especially involved when it comes to the financial side of the decision. This parental influence has prompted many institutions to tailor their marketing efforts toward parents. Colleges and universities promote the viewpoints that higher education is an investment with value added; that their particular institution is affordable; and that the high costs will pay off in the long run in terms of higher incomes, better networking in the workplace, and a more satisfying lifestyle. Many institutions have also published parent brochures promoting career support services and campus safety. Special parental activities are being built into campus visit programs. An increasing amount of attention is given to parents from university faculty and staff as well.

A study on college selection at Carleton College in Minnesota by Sullivan and Litten (1976) showed that nearly 75 percent of students indicated that parental influence greatly increased their desire to attend. With this influence, it is no wonder that institutions are focusing on the parent as a stakeholder in the decision process.

As the parent of a college freshman, Rothman (1999) also discusses college selection. She discusses the efforts of the City University of New York to recruit talented students, and how middle-class children leaving for college work against the University’s goal of retaining New York City’s top talent. Rothman argues that if the college offered dorms and enhanced college life, they would see a greater enrollment of middle-class students, possibly including her daughter.

So what are the best ways to discover the specific needs of students? Krukowski and Kane (1982) discuss the importance of marketing in college admissions. They believe that admissions offices should do market research to discover perceptions of potential applicants. This research may uncover valuable information about the perceptions of applicants on academic reputation, size, proximity to home, and many other factors.

**Which Recruiting Strategies Work?**

What specific factors really do influence a student’s college choice? Seymour (2000) reports that, “A recent survey of 10,000 high school students revealed a university’s Web site is the third most important source of information for prospective students, subordinate only to a campus visit and a conversation with a current student” (p. A1). Many university sites now feature virtual campus tours, course catalogs, student testimonials, listings of scheduled academic and extracurricular activities, and e-mail links to professors. Some educators believe that Web sites will eventually replace traditional brochures and guidebooks.

Hale (2000) reports a synthesis of over 100 studies conducted by The Gallup Organization for higher education institutions throughout the United States over the past fifteen years. Interviews were conducted with both “decisionmakers” (prospective students and their parents) and referral agents (high school guidance counselors and “key” teachers and coaches). The research was done with two-year community colleges, and four-year private colleges, private universities, and public universities. The four factors found to be “critically important” factors in college selection by students and parents were as follows: (1) How well the college prepares you for a career; (2) A quality education at a reasonable cost (a value); (3) The quality of the faculty; and (4) The quality of the specific academic program (“major”) of interest to the student.

**The Need for Understanding Rural vs. Urban Recruiting Differences**

Although the research completed in the field clarifies the problem at hand and offers some potential solutions, there are some gaps. More research is needed to delineate efforts to individualize the selection process. One way, as proposed in this study, is to extend the idea in place at Temple University to better understand and recruit students from the suburbs (Gose 1998). Research should be done to assess the needs of students from rural and urban areas. In doing this, universities will be able to cater to the needs of recruits more effectively. More individualized marketing campaigns could be developed to entice students from all areas, helping to fill the vacancies in classrooms.

This inductive study examines the factors influencing the post-secondary institution choices of both rural and urban high school students. Because this paper reports a preliminary investigation of rural and urban differences, there are no specific hypotheses developed, but rather the relationships and differences are carefully explored so as to provide preliminary results and guide future research studies examining these domains of interest.

**Methods**

**SAMPLE**

The sample for this study was drawn from a population of 81 college freshmen that applied, were admitted, and were offered a “New Full Differential Scholarship” to attend the host univer-
sity. The scholarship was awarded based on outstanding academic success in high school as determined by standardized test scores and high school class rank. Approximately 64 percent of the students were currently attending the host university, while the others declined the scholarship to attend another institution. All of the students graduated from high schools outside the home state, and had not established state residency as determined by the host university’s Office of Admissions. The population was 52 percent female and 48 percent male. All of the students in the population were at least 19 years of age at the time of data collection.

The census format of data collection yielded a response rate of over 60 percent. The actual sample size for the study was 49 students. This was a representative sample, as 69 percent were currently attending the host university. The gender breakdown of the sample was 52 percent female, 47 percent male.

MEASURES AND PROCEDURES

The students were contacted via telephone using a list generated from admissions data. Multiple attempts to contact the students were made if the first attempt was unsuccessful. The respondents were read an informed consent form (see Appendix A). The student then had the option to decline the survey and was informed that they had the option to terminate the survey at any time, and could request that their information not be used. Upon consent, the interview proceeded.

The survey was conducted as a structured phone interview using the script of questions as shown in Appendix B. Many of the questions on the instrument came from previous studies (Hale 2000; Ihanfeldt 1980; Krukowski and Kane 1982; Litten 1991; Seymour 2000; Stelzer 1999; Sullivan and Litten 1976; Wright 1993). When determining what constitutes urban and rural, the questions identified as important. Open-ended questions were added to allow participants to convey any thoughts, attitudes, and ideas that may not have been addressed in the instrument.

ANALYSIS OF DATA

Analysis of data included descriptive statistical and zero order regression. Two-tailed t-tests were calculated to determine the level of significance of each factor. The individual importance of each item was shown using descriptive statistical analysis.

Leverage analysis was also calculated to organize and understand the data. Leverage analysis summarized the data, in graphical form, into four categories. Each item was measured on the importance as an influencing factor in the student’s college decision. The items were then analyzed as to the individual item’s quality ranking at the host institution.

Results

DESCRIPTIVE ANALYSIS

As shown in Tables 1–3, the mean and standard deviation were calculated for each of the fifteen questions and their follow-up questions. The tables offer a comparison between the full data set (Table 1), the data from the rural respondents (Table 2), and the data from the urban respondents (Table 3). Zero order regressions were conducted, however, no significant correlations were found.

As shown in Table 1, the top factors influencing the respondents’ postsecondary education institution choices are financial aid, value, how well the institution will prepare them for a career, the quality of faculty, quality of specific programs, and academic reputation. This is quite similar to the rural students’ responses, as shown in Table 2.

The respondents from rural backgrounds indicated that financial aid, value, how well the institution will prepare them for a career, quality of faculty, quality of specific programs, and quality of facilities were the factors that most strongly influenced their postsecondary education institution choices. The contact from alumni appeared to be the least influential factor of those tested. Table 3 shows the means and standard deviations for the urban respondents.

The urban respondents indicated many of the same factors held great importance, such as financial aid, how well the institution will prepare them for a career, value, and quality of faculty. The urban students also assigned high importance to academic reputation and contact from faculty. Again, contact from alumni was the least influential factor.
The next descriptive analysis that was conducted was the comparison of means of the significant factors. Two-tailed t-tests were calculated to determine the level of significance of each factor. As shown in Table 4, the only factor that reached statistical significance was the campus visit, where the students from rural backgrounds rated the importance of a campus visit 0.87 points higher than the urban students when comparing the means for Question 2. While this is the only factor with statistical significance, the rural students also rated the Web site and contact from faculty higher. Proximity to home was rated higher by the urban students than the rural students. See Table 4.

**Leverage Analysis**

Following the descriptive analysis, a leverage analysis was completed to help organize and understand the data. With leverage analysis, the grand mean for the importance factor is calculated and plotted on the x-axis. The grand mean for the host university rating factor was calculated and plotted on the y-axis. This procedure creates four distinct quadrants, as shown in Figures 1-3. Each question is plotted as a data point on the leverage analysis graph. The first quadrant (Strengths) reflects those items that are seen by the respondents as influential factors for which the host university has a high rating. Quadrant 2 (Maintain) holds the items that the students rated as less important than the grand mean, but for the host university, rated higher than the grand mean. Quadrant 3 (Secondary Opportunities) shows those items seen as less important factors influencing the college selection process, with the host university ranking lower than the grand mean. Finally, quadrant 4 (Opportunities) contains those items ranked as having high importance and a low host university rating. See Figures 1-3.

In Figure 1 (all respondents), the items listed as “Strengths” were the campus visit, strength of academic programs, value, financial aid, quality of the facilities, and how well the institution will prepare the students for a career. The “Maintain” quadrant holds quality of athletic programs, while quadrant 3 (Secondary Opportunities) has the university Web site, contact with an admissions representative, contact with current students, contact with alumni, contact with faculty, and proximity to home. Finally, in the “Opportunities” quadrant were the quality of faculty and academic reputation.

When looking at influential factors and the host university quality rankings by rural respondents, the “Strengths” are iden-
tified as the campus visit, quality of programs, value, quality of facilities, financial aid, and how well the institution will prepare the student for a career. The items to “Maintain” are the contact with current students and quality of athletic programs. The “Secondary Opportunities” are the university Web site, contact with an admissions recruiter, contact with alumni, contact with faculty, and proximity to home. Finally, the “Opportunities” for the rural students were the quality of faculty and the overall academic reputation of the institution.

Many of the factors that influenced the rural students have similarly influenced the urban students. The “Strengths” include the quality of the programs, value, financial aid, quality of facilities, and how well the institution will prepare the students for a career; all of which were also strengths for the rural students. The factors to “Maintain” for the urban students were the campus visit and the quality of the athletic programs. The “Secondary Opportunities” included the university Web site, contact with an admissions recruiter, contact with current students, contact with alumni, and contact with faculty. The “Opportunities” for the urban students were proximity to home, the quality of faculty, and the overall academic reputation.

**Discussion**

Many conclusions can be drawn from the data collected in this study. Although there was only one statistically significant difference between the urban and rural students, valuable information was gathered about both groups. The ability to reach out to both rural and urban groups of students was also measured, and the information should be helpful in future recruiting campaigns as well as future research efforts.

Because rural students rated the Web site, campus tour, and contact with faculty somewhat higher than did urban students when choosing schools, these factors represent a largely untapped opportunity for targeted recruiting strategies of rural students. Since Web site, campus tour, and faculty contact were all important to rural students, creative linkages may be possible to target rural students. For example, with today’s (and tomorrow’s) technology, a university that can create a high quality Web site will be more likely to appeal to rural students. If this Web site could have some high tech features on it, such as a virtual campus tour, it will likely increase its appeal to rural students. Also, the Web site may have detailed faculty information containing profiles, contact information, and links to faculty home pages. A step further may be online question and answer sessions with faculty, or even edited “frequently asked questions” (FAQS) with faculty responses that could be consolidated and updated regularly. Each of these suggestions address

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**Table 4. Two-tailed t-test data**

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<th>Actual mean difference</th>
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<td>2.1063*</td>
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<td>-0.78</td>
<td>1.9596</td>
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<tr>
<td>6. Contact-faculty</td>
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Note. *Significance at p<.05
the three most important factors identified by rural students in their college/university choice. By finding creative ways to provide all three of these factors, universities are increasing their likelihood of broader appeal. Moving forward, one can foresee the importance of the Internet in college recruitment. By offering these services over the Internet, more students will have the opportunity to “see” the campus and contact faculty.

Both rural and urban students reported several criteria to be important in their college choice. Of the strengths indicated in the leverage analysis, many are tied to financial aid and academics. This result was expected, because the respondents are high-ability academic students that were offered a substantial scholarship to attend the host university. It seems that finances were a factor, and that these students were looking for a post-secondary institution that would allow them to continue their pursuit of academic excellence.

The “Maintain” quadrant could be expected. The “Strength” of the athletic programs consistently showed up as an item for which students rated the host university highly, but it had little impact on their college selection process. This is something that can be seen as a positive factor, but is not something that should necessarily be focused on in marketing efforts by the host university’s Admissions Office.

The “Secondary Opportunities” category brought some surprises. First, the Web site did not seem to be a factor for these students, although one could expect that it will become more of a factor in the future. Proximity to home did not seem to be a factor either. One explanation for this is that if a student makes a decision to leave his or her home state to attend college, the extent of the distance from home is not as important.

Many of the “Secondary Opportunities” revolved around personal contact. The respondents did not attach much importance to contact with admissions representatives, current students, alumni, or faculty members. This may seem contrary to the information regarding the importance of personal contact as illustrated earlier this paper. One possible explanation for the low marks for personal contact may be that it is not the relationships with others that the students are really after; rather, it is the expedited information gathering that is possible from the personal contact.

Finally, the “Opportunities” for the host university as pointed out in this study are the academic reputation and quality of faculty. These questions reflect the perception that these are important issues to students, and that they rate the host university lower than the grand mean. It seems that the host university should further promote its quality faculty and academic success as an institution.

This study brings up some suggestions for future research. One topic that could be explored is the issue of personal contact. While it seems that students want to receive more individualized contact, their motivation for this is unclear. Is it to build relationships, to expedite the information collection process, or both? Studies could be done to determine the motivation of students in desiring more individualized contact. Additionally, studies could be conducted which are designed to ascertain which forms of personal contact are most salient across and between high school students in their college selection process.

Since respondents did not attach much significance to the university Web sites, it seems ironic that the future of college recruitment will feature students using the Web sites to apply online, take virtual tours, contact faculty and staff, and learn more about the campus. One research opportunity may be to examine the growth and importance of the role that the Internet plays in college recruitment over the next five to ten years. This would help to further understand the impacts of changes that occur in the field of student recruitment as attempts are made to identify key factors that influence the postsecondary institution choices of high school students. It is our hope that a fruitful line of inquiry may be stimulated from this work.

References


———. 1997b. Elite private colleges see a drop in applications. The Chronicle of Higher Education. 7 March: A35


The authors would like to thank Lloyd Bell and Dann Husmann for their thoughtful input at various stages of this work.
Appendix A: Informed Consent Form

The study is entitled “Factors Influencing Postsecondary Education Institution Choices of Rural versus Urban High School Students.”

This is a research study that is part of an undergraduate honors research project. The purpose of the study is to determine the factors influencing the postsecondary education institution choices of high school students. You have been selected to participate because they expressed interest in the host university while making their college decision choice. The sample consists of college freshmen at least 19 years of age.

You are being asked to participate in a telephone interview regarding student recruitment. You will be asked to answer the questions honestly and as accurately as possible. It will take approximately 15 minutes to complete this interview. All necessary information will be obtained through the interview.

There are no risks or discomforts associated with this research. In the event of problems resulting from participation in the study, psychological treatment is available at the _____ Psychological Consultation Center, telephone (___) ____-_____.

The information gained from this study will be used to assist future recruiting efforts.

Your confidentiality will be strictly held. Individual responses will not be highlighted in the report; rather, all information will be presented as aggregated data. Any form of identification that may be used to identify the students (e.g. name, social security number, etc.) will be removed from the data before it is analyzed. The disk containing the data will be stored in a locked cabinet in the Department______, located in _____ at the_______(host university). The disk will be stored for two years, at which point it will be destroyed. The study will be published as an undergraduate honors research project and kept on file at the Honors Program Office, at the_________(host university). The study may also be submitted for publication in scholarly journals.

There will be no compensation for participating in this research.

You may ask any questions concerning this research and have those questions answered before agreeing to participate or during the experiment. Or you may call the investigator at any time, home phone, (phone number). If you have questions concerning your rights as a research subject that have not been answered by the investigator, you may contact the host university’s Institutional Review Board, at (phone number).

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigator, the host university or other participating agent.

You are voluntarily making a decision whether or not to participate in this research study. At this time, please indicate whether or not you understand and agree to the information presented.

Signed: _______________________________ Date: ____________
__________________________, Principal Investigator Home: (___) ____-_____

__________________________, Secondary Investigator Office: (___) ____-_____

WINTER 2002 C&U JOURNAL 9
Appendix B: Instrumentation

Do you consider your upbringing more urban or rural?
Are you currently attending college? *(If yes, proceed with interview. If no, then conclude.)*
Where are you currently attending college?
Why did you choose this postsecondary institution?

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<td>slightly important</td>
<td>fairly important</td>
<td>moderatly important</td>
<td>very important</td>
<td>extremely important</td>
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Please comment on the role your parents played in the selection of your postsecondary institution.

For each of the following items, please rate the significance to you when selecting a college or university. Then, as a follow-up to each question, indicate whether you received each form of contact from the host university. If not, indicate, “zero.” If so, please rate the host university on each of these criteria on a scale of one to five with five being the highest.

Please rate each of the following questions on a 0-5 scale as follows:
- University Web site
- Campus visit
- Contact with an admissions recruiter
- Contact with current students from the institution
- Contact with alumni from the institution
- Contact with current faculty from the institution
- Quality of faculty
- Quality of specific academic program
- Overall academic reputation of the institution
- Value of education *(Quality education at a reasonable price)*
- Financial aid package/scholarships
- Quality of the facilities
- Quality of athletic programs
- Proximity to home
- How well the institution will prepare you for a career

Of the above criteria, please rank the three most important factors influencing your college choice.
Is there anything else that comes to mind when you think back to the factors influencing your college decision?
The fair and accurate assessment of student performance is an integral part of teaching and learning, and those administering the evaluation process should take this responsibility seriously. Typically, grades are assigned by faculty; however, administrators and support personnel such as registrars and admissions counselors who are responsible for posting and articulating policy governing grades also play a major role. Principles used to guide the process include consistency, uniformity, fairness, and accuracy, but practices must include provisions for administrative staff as a matter of necessity and grading convenience.

Evaluation of student performance, if done well, is arduous and labor intensive. Construction and grading of tests and other student work can be growth facilitating for faculty. Likewise, assessment and feedback of students' work can be an excellent learning experience for students. The latter, however, is an aspect of the teaching/learning process that has great variability. Procedures connected with the administration of grades, such as posting of grades, transcript preparation, or transcript evaluation, become an important part of the student's total collegiate experience. For administrators and faculty alike, issues concerning grades contain great potential for personal conflict, e.g., grade appeals. The student is concerned about a specific grade in a course, but is equally concerned about the overall record displayed on a transcript. Grades represent an important component of the scholarly image of an institution of higher learning, and it goes without saying that image is an influence on all stakeholders.

Grading philosophies are predicated upon three standards: improvement throughout the course, mastery relative to an absolute skill or knowledge standard, and mastery relative to others. Precise terminology that reflects these three standards presents a great challenge. What does an 'A' mean and how does it differ from a 'B'? Or, what are the criteria for a “Pass” as opposed to a “Fail” or “No Credit”? In any grading system, the person who is responsible for assigning the grade faces the proposition that in one type of system, such as the A, B, C, D, or F system (also referred to as the ‘A-F’ grading system or scale), he/she might have more opportunities for error, but the error, if made, would in effect have less impact. In another system, such as Pass/Fail, there would be fewer opportunities for error, but if an error were made, it would have much more impact. Such a proposition is undesirable, yet it is at the heart of the dilemma of assigning grades (Academic Senate 1996).

Grades tend to support student motivation and success (Ebel 1974; Eiszler 1973; Lunneborg 1977; Stallings and Leslie 1970; Warren 1975). Clark (1969) explored the single factor of competition for grades as a source of motivation and found that performance among graduate students significantly increased under conditions when the students were expected to compete for grades. Eiszler (1983) agreed, but added that grades were perceived to be more valuable and important when individual achievement was determined by standards of mastery rather than against the performance of other students. Likewise, in using the plus/minus grading system, it is extremely important for students who are highly motivated and high-performance oriented to see rewards reflected in their grades. Conversely,

**Abstract**

This study analyzed grades for 8,088 master's level graduate students to determine whether or not there were differences in grading patterns between the A, B, C, D, and F grading system and the plus/minus grading system. The study period was 1990–1995 for the A, B, C, D, and F grading system, and 1996 through the summer of 2000 for the plus/minus grading system.

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Bobby G. Malone, Jacquelyn S. Nelson, and C. Van Nelson

A Study of the Effect of the Implementation of the Plus/Minus Grading System on Graduate Student Grades

Bobby G. Malone, Associate Professor of Educational Leadership at Ball State University, earned his doctorate at Mississippi State. He teaches the research colloquium for doctoral students and conducts research in the superintendency and principalship.

C. Van Nelson is Professor of Computer Science at Ball State University. He earned his doctorate in Educational Research from Indiana University and has published papers in evaluation of instruction and application of neural networks to classification problems.

Jacquelyn S. Nelson, Ph.D., is Assistant Dean of the Graduate School and Adjunct Professor of History at Ball State University. She has written a book on Quakers in the Civil War, published articles in historical journals, and has presented papers on issues concerning graduate education.
students who have less motivation should also see consequences reflected in their grades.

Plus/Minus Rationale

Colleges and universities that utilize four-point undergraduate grading systems are increasingly making those systems more detailed and specific. Quann (1987) raised the expectation that more institutions would implement plus and/or minus grading systems as a response to grade inflation. Cole (1993), Grieves (1982) and Singleton and Smith (1978) pointed to the need for more accurately and specifically reflecting a student’s performance. In the 1992 national study, the American Association of Collegiate Registrars and Admissions Officers (AACRAO) presented findings which included Singleton and Smith’s (1978) argument that institutions that implemented plus and/or minus grading systems would also help their faculty in awarding more reliable grades of student performance. Students do not score at the mean of each of the letter grades; instead, students score at the full range of possibilities, and the assignment of a letter grade precludes the faculty member from accurately indicating the students’ appropriate score (Academic Senate 1996). With the existence of inflated grades, the predictive validity of a student’s record would be more accurate if the student were evaluated on a plus and/or minus scale. Grade inflation, however, was not expressed as a concern in the AACRAO study and was not a goal associated with the implementation of the plus/minus grading option (AACRAO 1992).

Trends of assessing student achievement represent a departure from the traditional A, B, C, D, or F grading system. Pass/Fail, Satisfactory or Unsatisfactory, Credit/No Credit and other types of scales have emerged, but one that seems to have increasing implementation is the plus/minus system. This system has emerged out of an imperative that faculty are ethically obliged to ensure consistent, fair, and accurate evaluations of student performance.

In essence, the implementation of the plus/minus grading option allows for communicating better and more accurate information to students about their performance. Such a system of accountability must include qualitative and quantitative academic standards. Accountability is consistent with the rising public and governmental concern about accountability in higher education as financial support for colleges and universities declines and institutions are asked to meet growing demands with fewer resources. The A, B, C, D, or F system is too coarse (Academic Senate 1996), less precise than a plus/minus system, fails to discriminate between exceptional and average student performance, and promotes the “bunching” and grouping errors of grades (Frankel 1975; Millman et al. 1983; Stroup 1966). Student achievement can differ by nearly 25 percent and result in the same grade and grade value in computing the cumulative average. Conversely, student achievement may not differ by more than 1 percent yet result in adjacent grades 25 percent apart in value for GPA purposes. With the plus/minus grading option there is greater potential for the evaluation determined by the instructor to be more accurate in the assigned grade (Academic Senate 1996).

Background of the Study

A midsize Midwestern university with an average undergraduate enrollment of 15,000 and graduate enrollment of 2,600 adopted the plus/minus grading system in 1996. In 1984, the university had discussed the need for a more flexible grading system and had surveyed the faculty as to various aspects associated with such a change. When the 269 faculty responses were summarized, there was almost equal agreement and disagreement as to retaining the grading system that was in place at the time, i.e., the ‘A–F’ scale. Comments against the change ranged from “If it’s not broken, don’t fix it!” to “Plus/minus is a cop out. Either a student earns an ‘A’ or it should be a ‘B.’” Comments in favor of the change emphasized the need for finer distinctions in grading. Most of the faculty who had previous experience with plus/minus elsewhere tended to prefer it. A rather large number of faculty members commented that they personally used the plus/minus system in their grading anyway, but had to simplify it when turning in official grades (Scarbeck 1995). Of special interest to this study were the recurring comments that plus/minus appeared more appropriate at the graduate level than at the undergraduate level.

In 1995, the faculty-elected governance body appointed a committee to investigate the potential effects of changing to a plus/minus grading system. Motivation for departing from the A, B, C, D or F system included the rationale that the majority of Indiana institutions and schools in the Mid-America Conference, the athletic conference to which the university under study is a member, used the plus/minus system. The grades committee chair added to the discussion, “This is the plan that is spreading throughout the nation” (Scarbeck 1995). The discussion also included the rationale that the plus/minus system would include more than twice as many grades as before, but there would not necessarily be a greater span among final grades in a class.

Student input into the discussion included concerns that the plus/minus grading system would hurt some students. With the addition of the ‘A−’ option, the student representative on the governance committee expressed apprehension that professors would award fewer ‘As’ and thus have the effect of bringing down a student’s GPA. “Without the counterbalancing effect of an ‘A+,’ the effect of more ‘A−’ grades would be adverse for students trying to enter professional schools such as law and medicine.” The student representative went on to say that the students she had spoken with about the plus/minus grading system opposed it (Scarbeck 1995).

The chair of the University Senate, to which the academic governance body reported, offered further procedural clarification. She indicated that the plus/minus system would be announced at a Senate meeting but would not be submitted to a vote. The chair explained that when the Senate assigned the task to the three-person committee to finalize the plus/minus plan, it also delegated authority to the faculty governance committee for approval of the plan. The Senate chair also indicated that the university president had agreed to submit the concept of plus/minus grading to the university’s Board of Trustees for approval (Scarbeck 1995). The Board subsequently sanctioned the change.
The transition from the traditional 'A-F' grading system to the plus/minus grading system entailed other changes. In order to compute grade point averages that reflected the dispersion of grades via the plus/minus system, decimal equivalents were established. The decimal equivalents that accompanied the recommendation of the plus/minus grading system were as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Decimal Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.00</td>
</tr>
<tr>
<td>A-</td>
<td>3.667</td>
</tr>
<tr>
<td>B+</td>
<td>3.333</td>
</tr>
<tr>
<td>B</td>
<td>3.00</td>
</tr>
<tr>
<td>B-</td>
<td>2.667</td>
</tr>
<tr>
<td>C+</td>
<td>2.333</td>
</tr>
<tr>
<td>C</td>
<td>2.00</td>
</tr>
<tr>
<td>C-</td>
<td>1.667</td>
</tr>
<tr>
<td>D+</td>
<td>1.333</td>
</tr>
<tr>
<td>D</td>
<td>1.00</td>
</tr>
<tr>
<td>D-</td>
<td>.667</td>
</tr>
<tr>
<td>F</td>
<td>0.00</td>
</tr>
</tbody>
</table>

The recommendation for awarding a decimal equivalent of 4.333 for an 'A+' was defeated because it "would throw off the whole four-point system" (Scarbeck 1995).

The 1992 AACRAO study confirmed the increasing use of the plus/minus grading system. From 1982 to 1992, the number of institutions adopting the plus/minus grading system increased by 12 percent. Survey results indicated that 91 percent of the respondents who had made substantive changes noted the addition of the plus/minus scale to their letter grade systems. On the other hand, while 97 percent of the responding institutions used some form of letter grading, only 35.6 percent used both plusses and minuses (Riley et al. 1996).

**Problem and Significance of the Study**

While much has been written in general about grading practices in post-baccalaureate education, information documenting the effects of changing from the A, B, C, D, or F grading system to a plus/minus grading system at the graduate level is sparse. Most research studies have emphasized the effects of the implementation of the plus/minus grading system on undergraduate grade point average (UGPA), with grade inflation as the central theme. These studies produced diverse results. Some investigators found the use of plusses and minuses corresponded closely with a rise in UGPA (Juola 1980; Millman et al. 1983). Other researchers found that the plus/minus grading system lowered UGPA and could be used to control grade inflation (Hendrickson 1976; Philbrick and O'Donnell 1968; Stroup 1966). Quann (1987) said, however, the plus/minus scale would check grade inflation only if the 'A+' grade did not receive more quality points than an 'A' grade. However, regarding grade inflation, the few available investigations at the graduate level have shown that grade inflation patterns, while existing at the higher level, are different from patterns at the undergraduate level (Carney, Isakson, and Ellsworth 1978; Juola 1980).

The impact of changing to the plus/minus system begged investigation. The university under study has utilized the system since 1996. Advantages of the plus/minus grading system are supported by anecdotal information, but little to no empirical research has been undertaken to determine its effects on graduate grades. Information regarding the effect of the system on computed graduate grade point average (GGPA), on faculty assignment of grades, or the discernment among faculty as to the precision of their assessment of student achievement, progress, or rank in class is needed. What impact has the system had on cumulative grade point averages of graduate students? Has the impact, if any, been more pronounced in some programs than others? What is the perception of graduate students toward the system? Have faculty used the system? An investigation of the four years of data that exist provided answers to these pertinent questions.

When a university changes its grading system, the effects of such a change can be far reaching. The previous questions as well as the formal research questions that follow served to frame and focus the study.

**Research Questions**

1. Do the graduate faculty use the plus/minus grading system?
2. Has the plus/minus grading system affected the cumulative grade point average of graduate students in comparison to the cumulative grade point average of graduate students prior to its adoption?
3. Does the effect of the plus/minus grading system on cumulative grade point average differ among academic graduate programs?
4. Does the effect of the plus/minus grading system differ among graduate students when their cumulative undergraduate grade point averages are compared?
5. Is graduate faculty perception of the effect of the plus/minus grading system in agreement with the actual grades assigned?
6. Does graduate faculty perception of the effect of the plus/minus grading system differ by academic disciplines?
7. Do graduate faculty perceive the plus/minus grading system as promoting student learning and motivation?
8. Does the plus/minus grading system allow graduate faculty to improve the accuracy of assessing graduate student achievement?
9. Is the use of the plus/minus grading system influenced by departmental graduate admissions standards?
10. Are the graduate faculty aware of the plus/minus decimal equivalents that are used in computing GPA?
11. How do graduate faculty perceive student attitudes toward the plus/minus grading system in individual graduate departments?

**Procedures and Methodology**

This study was conducted in two phases. First, a survey instrument was administered to the graduate faculty to assess their perceptions of the effect of the plus/minus grading system on graduate grades. Second, an analysis of the graduate grade point average (GGPA) in the first three graduate courses for master's level students who were enrolled under the 'A-F' grading system was compared to students who were enrolled after the implementation of the plus/minus grading system. The choice for the three classes was based on previous research (Kingston 1985; Nelson and Nelson 1995; Nelson, Nelson, and Malone 2000; Rhodes 1994; Thompson and Korbak 1983; Vaseleck 1994) that indicated no significant difference in the grade point average in the student's first nine semester hours or first year of graduate study and the student's grade point average at the completion of
the graduate course of study. Master’s level students were chosen because they have historically represented the largest group of graduate students (approximately 70 percent) at the institution under study.

A three-way analysis of variance was performed on the nine-hour GGPA with the following factors: academic area, type of grading system, and undergraduate performance (UGPA). Academic area consisted of nine general areas in which master’s degrees were sought: applied sciences, architecture, business, communication sciences, education, humanities and arts, life sciences, physical sciences, and psychology. These groupings were similar to the categories used by Educational Testing Service (2000) in analysis of Graduate Record Examinations (GRE) scores, and also followed the college organizational lines at the university under study. The type of grading system was either the ‘A-F’ letter grade system or the plus/minus grading system. Cumulative UGPAS were categorized into three groups: above 3.5, above 3.0 and below 3.5, and below 3.0.

**Survey Instrument**

The survey instrument consisted of 34 items. Development of the instrument involved several iterations to provide precise language that eliminated ambiguous statements. A faculty member knowledgeable in survey research critiqued the instrument for clarity and purpose. The instrument was then administered to selected faculty who had expertise in psychometrics. The suggestions from this latter group were then incorporated into the final version that was administered to the graduate faculty.

The types of survey items were broken down as follows:

1. Twenty-one Likert scale items for which the responses to choose from were: “Strongly Agree” (SA), “Agree” (A), “No Opinion” (N), “Disagree” (D), and “Strongly Disagree” (SD);
2. Eight items requiring “Yes” or “No” responses; and
3. Four demographic type items, e.g., the identification of academic rank, years of service at the university, and academic discipline.

Two additional items requested the respondents to indicate the level of their use of the plus/minus grading system and the trend of grade changes and appeals they had experienced since the addition of plusses and minuses to the grading scale.

The Likert scale items were subjected to a principal axis factor analysis followed by an oblique rotation to see if certain items could be grouped together. From this process, factor scores were calculated. An analysis of variance (ANOVA) was used to determine if factor scores differed by academic area. The ANOVA was also used to examine whether or not the length of service at the university in the study made a difference in the responses to the survey items.

**Population**

Surveys were sent to the university faculty who taught graduate courses. Determining the specific number of faculty who taught graduate courses was a complicated process since most of the faculty taught a combination of graduate and undergraduate courses. Faculty who taught undergraduate courses only were not included in the study. Originally, 612 surveys were sent to the faculty through campus mail. Thirty were either returned or eliminated for various reasons, e.g., the faculty member was no longer with the university or was on academic leave. Completed surveys were received from 273 faculty members for a return rate of 45 percent. Surveys from 23 individuals who taught undergraduate courses only were excluded from the study, leaving the responses of 250 faculty members available for analysis.

Data were analyzed for 8,088 master’s level students who completed at least three graduate courses with a minimum GGPA of at least 1.0. Grades below 1.0 were excluded from the study to eliminate data of students who had abandoned classes. This prevented skewing of the data and represented the effect of the type of grading system employed on actual grades earned in courses. Cumulative grade averages were available for 4,944 students enrolled under the ‘A-F’ letter grade system between 1990 and 1995 and for 3,144 students enrolled after implementation of the plus/minus grading system from 1996 through the summer of 2000.

**Analysis of Data**

**SURVEY AND GRADE DISTRIBUTION RESULTS**

Analysis of the data is presented by the individual research questions that guided the study. The data are presented from each of the two data sources: the survey data and analysis of grades that had been awarded to students enrolled after implementation of the plus/minus grading system from 1990 and below 3.0.

**Research Question #1. Do the graduate faculty use the plus/minus grading system?** On the survey, the graduate faculty were asked how much they used the plus/minus grading system. Table 1 shows the responses of the faculty by degree of use,

| Table 1. Faculty Responses by Percentage of the Use of the Plus/Minus Grading System by Academic Rank, Years of Service at the University, and Academic Area |
|---------------------------------|----------------|----------------|----------------|
|                                | Never Use | Use Occasionally | Use Considerably |
| Assistant Professor           | 1.8       | 10.7            | 87.5            |
| Associate Professor           | 3.9       | 17.9            | 78.2            |
| Full Professor                | 6.4       | 23.6            | 70.0            |
| 1-4 Years at University       | 4.9       | 9.8             | 85.3            |
| 5-9 Years at University       | 0.0       | 16.7            | 83.3            |
| 10-14 Years at University     | 7.0       | 16.3            | 76.7            |
| 15+ Years at University       | 5.5       | 24.8            | 69.7            |
| Applied Sciences              | 0.0       | 20.7            | 79.3            |
| Architecture                  | 0.0       | 0.0             | 100.0           |
| Business                      | 23.0      | 43.7            | 31.3            |
| Communication Sciences        | 0.0       | 16.7            | 83.3            |
| Education                     | 3.1       | 21.9            | 75.0            |
| Humanities/Arts               | 1.7       | 10.2            | 88.1            |
| Life Sciences                 | 3.6       | 25              | 71.4            |
| Physical Sciences             | 12.0      | 16              | 72.0            |
| Psychology                    | 12.0      | 16              | 72.0            |
| All Faculty                   | 4.4       | 18.9            | 76.7            |
faculty rank, number of years at the institution studied, and academic area.

Use of the plus/minus grading system varied according to years of experience, faculty rank, and academic discipline. Faculty rank and years of experience at the institution studied were inversely related to the percentage of those who utilized the plus/minus grading system. The higher the academic rank and the number of years of experience of the faculty, the lower the percentage of use of the new grading scale. Variations in the degree of use were also seen between academic disciplines.

**Research Questions #2 and 3.** Has the plus/minus grading system affected the cumulative grade point average of graduate students in comparison to the cumulative grade point average of graduate students prior to its adoption? Does the effect of the plus/minus grading system on cumulative grade point average differ among academic programs? Grade point averages were compared for students before and after the adoption of the plus/minus grading system for the period 1990 through 1999. The results of the comparison are shown in Table 2.

The key to interpreting the data in Table 2 is to observe the changes before and after 1996 when the plus/minus grading system was implemented. Overall, no significant change was noted; however, in some disciplines, slight declines can be observed. The differences in the grade point averages generally show a downward pattern. Interestingly, this was one of the reasons students opposed adopting the plus/minus grading system.

While the cumulative GPA has not changed dramatically since the adoption of the plus/minus grading system, the number of ‘A’ grades has decreased significantly. Table 3 shows the decrease in the assignment of ‘A’ as reflected in the first nine hours of graduate study.

As indicated earlier, grades in graduate school usually fall into the ‘A’ and ‘B’ range with a few ‘Cs.’ Table 3 depicts the percentage of ‘A’ grades before and after the change to the new grading system. While all academic disciplines showed a decrease in the percentage of ‘A’ grades awarded when pluses and minuses were employed, a particularly sharp contrast was evident between 1995 and 1996 in the fields of education and humanities and arts. Again, student concerns that fewer ‘As’ would be granted were supported by the data. While the percentage of ‘A’ grades in many areas has rebounded slightly since 1996, although not to the pre-1996 levels, only in psychology and architecture did the awarding of ‘As’ continue a consistently downward trend.

**Research Question #4.** Does the effect of the plus/minus grading system differ among graduate students when categorized by cumulative undergraduate grade point average? The three categories into which records were placed to address this question depended upon the students’ cumulative UGPAs. Based

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### Table 2. Average Cumulative GPA of Master's Level Students Upon Completion of the First Nine Hours Graduate Hours

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</thead>
<tbody>
<tr>
<td>N=842</td>
<td>N=880</td>
<td>N=936</td>
<td>N=911</td>
<td>N=754</td>
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<td>N=782</td>
<td>N=793</td>
<td>N=666</td>
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<tr>
<td><strong>Applied Sci</strong></td>
<td>3.66</td>
<td>3.68</td>
<td>3.62</td>
<td>3.68</td>
<td>3.66</td>
<td>3.7</td>
<td>3.7</td>
<td>3.72</td>
<td>3.72</td>
<td>3.69</td>
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<tr>
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<td>3.58</td>
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<td>3.62</td>
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<td>3.39</td>
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<tr>
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<td>3.49</td>
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<td>3.85</td>
<td>3.83</td>
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<td>3.67</td>
<td>3.58</td>
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<td>3.68</td>
<td>3.69</td>
<td>3.57</td>
<td>3.61</td>
<td>3.67</td>
<td>3.66</td>
<td>3.7</td>
<td>3.68</td>
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<td><strong>All</strong></td>
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<td>3.64</td>
<td>3.63</td>
<td>3.66</td>
<td>3.66</td>
<td>3.64</td>
<td>3.67</td>
<td>3.6</td>
<td>3.63</td>
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</tbody>
</table>

### Table 3. Percentage of All 'A' Grades in the First Nine Hours of Graduate Courses

<table>
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</thead>
<tbody>
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<td>N=842</td>
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<td>N=621</td>
<td>N=903</td>
<td>N=782</td>
<td>N=793</td>
<td>N=666</td>
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<td><strong>Applied Sci</strong></td>
<td>43.3</td>
<td>50.1</td>
<td>39.6</td>
<td>40.6</td>
<td>41.4</td>
<td>38.5</td>
<td>29.1</td>
<td>31.4</td>
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<td>27.2</td>
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<tr>
<td><strong>Architecture</strong></td>
<td>28.6</td>
<td>24.2</td>
<td>18.6</td>
<td>19.2</td>
<td>25</td>
<td>32.3</td>
<td>8.8</td>
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<td>10.3</td>
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<tr>
<td><strong>Comm Sci</strong></td>
<td>26.6</td>
<td>21.4</td>
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<td>21.6</td>
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on the concept that stronger academic students earn higher undergraduate grades, the data were divided into clusters representative of the students’ achievement at the baccalaureate level. The divisions were UGPA above 3.5, above 3.0 and below 3.5, and below 3.0. The impact of the plus/minus grading system on each category of academic accomplishment is shown in Table 4.

Table 4 displays average cumulative GPAs before and after the plus/minus grading system was adopted. Average cumulative GPAs were computed for the nine academic areas for the years 1990-1995 and 1996-2000, and divided into the categories discussed above. Very little change is noted in the overall GPAs; however, slight variations can be seen between and within academic areas when comparing the two grading systems. The better the undergraduate performance, the better the grades earned in graduate courses. However, the overall nine-hour GPA for the three groups was almost the same for each type of grading scale. Less variation in GPA was observed for those students whose UGPA were above 3.0 and less than 3.5 than for the stronger academic group. And, for the weakest students, i.e., those whose UGPA were lower than 3.0, graduate grades dropped after the new grading scale was utilized, especially between the years 1995 and 1996. It is important to note that for some academic areas, the nine-hour GPA was better for the plus/minus scale than for the ‘A–F’ scale, while for other areas, the opposite was true. Complete data for the three groups, displayed by year and academic area, are found in Appendix A.

The analysis of variance on the means given in Table 4 produced the results displayed in Table 5.

While the three main effects were significant, a significant interaction occurred between the type of grading system and the area of study. This interaction was not surprising, given the means presented in Table 4. In some areas, the GPA decreased after implementation of the plus/minus system. In other areas, the GPA decreased. Therefore, an analysis of the simple effects for the differences in the nine-hour GPA between the types of grading systems for each area was conducted. The results are shown in Table 6.

One may conclude that the change in the grading system from the ‘A–F’ scale to the plus/minus scale was different for different academic areas. The GPA in the business area improved when the plus/minus scale was implemented. The GPA decreased in applied sciences, communication sciences, education, humanities and arts, and psychology.

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<th>After Plus/Minus-UGPA</th>
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Table 5. Analysis of Variance of GPA by Area, Grading System, and Performance

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<th>Degrees of freedom</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
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Table 6. Analysis of Simple Effects

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<td>1</td>
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<td>Life Sciences</td>
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<td>Physical Sciences</td>
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<td>9.050**</td>
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<td>Within cells</td>
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<td></td>
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</table>

*Significant at .05 **Significant at .01
Research Questions #5 and 6. Is graduate faculty perception of the effect of the plus/minus grading system in agreement with the actual grades assigned? Does graduate faculty perception of the effect of the plus/minus grading system differ by academic disciplines? Faculty responses to five specific items on the survey were compared with the actual grades that were assigned. Faculty responses showed variation between those items, and not all responses from individual academic areas agreed with the overall results. Collective opinion disclosed that faculty tended to disagree with the item "The plus/minus grading system helps the weaker student." When disaggregated by academic area, however, the survey results demonstrated that faculty in architecture, communication sciences, humanities and arts, and life sciences perceived the plus/minus grading system as helping students whose UGPAS were low. Figure 1 illustrates those findings.

Actual data confirmed faculty perceptions in that GGPAS of the weakest category of students (UGPAS < 3.0) declined slightly after the plus/minus grading system was implemented (see Table 4). Again, results fluctuated by academic area. Only grades in business, life sciences, and psychology showed improvement with the new grading scale.

Generally speaking, faculty disagreed with the item "Grades are lower as a result of the plus/minus grading system," although responses were widely dispersed. Only in psychology did faculty indicate concurrence on this item. Results are shown in Figure 2.

Grade analysis did not support faculty perceptions. Cumulative GGPAs did not change with the addition of plusses and minuses, but in architecture, business, communication sciences, education, humanities and arts, and physical sciences grades did decline. Interestingly, grades in psychology rose slightly after 1996, in contrast to faculty opinion in that discipline (see Table 4).

Faculty concurred most strongly on the item that the plus/minus grading system helped borderline students, i.e., students whose evaluation fell between two grades on the A, B, C, D, or F grading scale. Considerable agreement (over 40 percent) was evident in all academic areas except business, where only 25 percent concurred. Figure 3 illustrates those findings.
Faculty responses were widely dispersed on the item “The plus/minus grading system has not affected grade inflation.” Most of the faculty agreed, though not overwhelmingly, that the plus/minus grading system had not affected grade inflation. However, responses from faculty in communication sciences, life sciences, physical sciences, and psychology indicated that grade inflation was indeed affected by the new grading scale. Faculty perceptions on this item are shown in Figure 5.

Grade data disaggregated by year and academic discipline showed only slight changes in GPPA over the last ten years. Thus, grade inflation, defined here as a sustained rise in GPPA, was not perceived to have been a problem (see Table 2).

**Research Question #7.** Do graduate faculty perceive the plus/minus grading system as promoting student learning? Faculty responses were generally dispersed as to the plus/minus grading system’s promotion of student learning, but except for faculty in architecture, many expressed no opinion on this item. The general pattern was agreement that the new grading scale encouraged scholarship. Only in applied sciences, business, life sciences, and psychology did faculty opinion indicate that plusses and minuses did not improve learning. The findings are displayed in Figure 6.

**Research Question #8.** Does the plus/minus grading system allow graduate faculty to improve the accuracy of assessing student achievement? Faculty in all academic areas agreed that the plus/minus grading system improved the accuracy of assessing student performance. Interestingly, the highest percentage of respondents who disagreed with this item represented faculty from business; nearly one-fourth believed that plusses and minuses did not increase accuracy in assigning grades. Conversely, nearly 90 percent of the architecture respondents strongly agreed that the new grading scale elevated the precision of evaluating student achievement. Figure 7 illustrates those results.

**Research Question #9.** Is the use of the plus/minus grading system influenced by departmental graduate admissions standards? Two survey items served to address this question. A majority of the faculty did not perceive a link between graduate admissions standards and the grading system; however, over 25 percent thought there was a link. A word of explanation is needed here. If grade point average is used as an admission variable, changing the grading system could potentially affect the cumulative grade point average, therefore affecting the cutoff scores that had been established. While 25 percent of the faculty...
responding perceived a link between admissions standards and the grading system, less than 10 percent agreed that admissions standards reflected the need for the plus/minus grading system.

**Research Question #10.** Are the graduate faculty aware of the plus/minus decimal equivalents that are used in computing CGPA? Computation of grade point averages is not the responsibility of faculty, but it has implications for students in various ways, e.g., rank in class, transfer of grades. When the plus/minus grading system was adopted in 1996, a decimal equivalent system was established to convert grades into cumulative grade point averages. Faculty tended to be unaware of the decimal equivalent system (79.9 percent) after plusses and minuses were added. In addition, only 16.3 percent of the respondents indicated they included the decimal equivalents on their syllabi.

**Research Question #11.** How do graduate faculty perceive student attitudes toward the plus/minus grading system in individual graduate departments? Faculty responses to the item on the survey indicated that faculty simply did not know how students felt about the grading system (77 percent). Perhaps this item might become a catalyst for faculty to discuss the grading scale more systematically with students.

**Principal Axis Factor Analysis of the Survey Instrument**

A principal axis factor analysis was performed on the 21 Likert items of the questionnaire. Seven factors were extracted, which accounted for 64 percent of the variance. An oblique rotation was performed and this resulted in the loadings for the first four factors displayed in Table 7.

Examination of the loadings and the direction of the loadings in Table 7 showed that Factor 1 seemed to represent the appropriateness of the plus/minus grading system for graduate work. The loadings on Factor 2 reflected the views of those who felt that a plus/minus system was inappropriate for graduate work. The relatively high negative loading of Question #7 on Factor 3 indicated a viewpoint that the plus/minus grading system was not perceived as a lowering of grades. The high negative loading of Question #12 on Factor 4 represented a perception that the plus/minus grading system was of no help to borderline students.

From the factor scores produced by the 21 survey items, an eight-by-two analysis of variance (ANOVA) was performed on the first four factor scores for each respondent, where the respondents were categorized by discipline (for this part of the analysis, architecture was considered an applied science) and length of time at the university (fewer than ten years, ten years or more). The results of the analysis of variance are presented in Table 8.

It is noteworthy that for the scores of Factor 1 and Factor 4, the academic discipline of the respondent was significant, but not the length of service. For Factor 3, the length of service of the respondent was significant, but not the academic area. Factor 2 did not yield any significant differences either between the academic area of the respondent or the length of service of the respondent.

The perception of the appropriateness of the plus/minus grading system varied among academic disciplines. The perception of the effect of the plus/minus grading system as a deterrent to grade inflation varied by the length of service of the respondent, but was not affected by discipline.

**Table 7. Factor Loadings for the 21 Likert Items**

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<tr>
<th>Item</th>
<th>Factor 1</th>
<th>Factor 2</th>
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**Discussion and Conclusions**

Implementing a new grading system holds the potential for change. The impact may be real or perceived. Whether real or not, perception is often reality to those doing the perceiving. In the case of the plus/minus grading system discussed in this study, student perception held a measure of truth. Grade point averages did decline, especially in some academic areas. Faculty opinion prior to the implementation of the plus/minus grading system indicated that this new scale appeared more appropriate at the graduate level than at the undergraduate level. After four years of using plusses and minuses in the grading process, faculty continued to support this concept. Faculty perception in some cases reflected an attitude of “another innovation, so what?” In other cases faculty felt strongly that the plus/minus grading system held an advantage in that it enabled them to be more precise in assigning grades. Younger faculty tended to use the new system more than older faculty. Faculty who were lower ranked tended to use the plus/minus system more.

Grades in graduate school usually have a very narrow range. The objective of grades should be to provide an indication of the learning that has taken place. In this study, a wide variation of grades that were assigned within academic areas and among academic areas leads to the conclusion that grades have very different meanings and purposes for faculty who assign them.
When one is interested in a more analytical discernment, the plus/minus grading system offers more options. When one uses a more holistic approach, the plus/minus still contains the ‘A–F’ options.

Faculty perceptions as to the effects of the plus/minus grading system varied by academic area. Sharp differences were noted on some survey items between faculty perceptions from one academic area to another. The raw data showed that faculty tended to agree most on the plus/minus grading system helping borderline students. However, interpretation of this item apparently referred to students who were between grades, not in danger of failing, because the factor analysis revealed the perception that the plus/minus grading system was of no help to borderline students. Faculty did not think the plus/minus grading system helped the weaker student, but did think that stronger students got higher grades as a result of the new system.

Graduate student grades changed immediately after the plus/minus grading system was adopted. Grades were lower in 1996 than from the previous year under the ‘grades assigned. However, it is important to keep in mind that most of the student apprehension at the university studied reflected the potential effect of grades assigned in undergraduate courses, not at the post-baccalaureate level.

The data and faculty survey pointed to a clear difference in grading philosophies among the academic disciplines. Institutions considering the addition of pluses and minuses to their grading systems would do well to evaluate the existing grading practices of each academic discipline. Analysis of actual grades assigned in addition to student and faculty surveys concerning the meaning of grades and how they are assigned will better prepare institutions for possible ramifications of such a policy change.

References


Appendix A

Table A1. Average Cumulative GGPA of Master's Level Students Upon Completion of the First Nine Graduate Hours Whose Undergraduate Graduate Point Average was 3.5 and Above

<table>
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<td>3.83</td>
<td>3.88</td>
<td>3.87</td>
<td>3.78</td>
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<tr>
<td>All</td>
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<td>3.83</td>
<td>3.82</td>
<td>3.8</td>
<td>3.78</td>
<td>3.81</td>
<td>3.85</td>
<td>3.8</td>
<td>3.77</td>
<td>3.81</td>
</tr>
</tbody>
</table>

Table A2. Average Cumulative GGPA of Master's Level Students Upon Completion of the First Nine Graduate Hours Whose Undergraduate Graduate Point Average was Between 3.0 and 3.5

<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td>N</td>
<td>322</td>
<td>328</td>
<td>375</td>
<td>352</td>
<td>302</td>
<td>250</td>
<td>336</td>
<td>321</td>
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<tr>
<td>Applied Sci</td>
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<td>3.71</td>
<td>3.75</td>
<td>3.64</td>
<td>3.72</td>
<td>3.69</td>
<td>3.76</td>
<td>3.77</td>
<td>3.7</td>
<td>3.74</td>
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<tr>
<td>Architecture</td>
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<td>3.69</td>
<td>3.62</td>
<td>3.6</td>
<td>3.54</td>
<td>3.57</td>
<td>3.53</td>
<td>3.63</td>
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<tr>
<td>Business</td>
<td>3.36</td>
<td>3.32</td>
<td>3.35</td>
<td>3.34</td>
<td>3.49</td>
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<tr>
<td>Hum/Arts</td>
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<td>3.65</td>
<td>3.72</td>
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<td>3.61</td>
<td>3.5</td>
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<td>3.7</td>
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<td>Physical Sci</td>
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<tr>
<td>Psychology</td>
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<td>3.81</td>
<td>3.8</td>
<td>3.78</td>
<td>3.72</td>
<td>3.59</td>
<td>3.59</td>
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<tr>
<td>All</td>
<td>3.65</td>
<td>3.66</td>
<td>3.67</td>
<td>3.63</td>
<td>3.69</td>
<td>3.68</td>
<td>3.67</td>
<td>3.7</td>
<td>3.65</td>
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</table>

Table A3. Average Cumulative GGPA of Master's Level Students Upon Completion of the First Nine Graduate Hours Whose Undergraduate Graduate Point Average was Below 3.0

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>335</td>
<td>371</td>
<td>364</td>
<td>342</td>
<td>260</td>
<td>194</td>
<td>341</td>
<td>287</td>
<td>181</td>
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<td>Architecture</td>
<td>3.45</td>
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<td>3.53</td>
<td>3.42</td>
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<td>3.54</td>
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<td>Business</td>
<td>3.36</td>
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<td>3.35</td>
<td>3.43</td>
<td>3.28</td>
<td>3.39</td>
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<tr>
<td>Education</td>
<td>3.72</td>
<td>3.68</td>
<td>3.7</td>
<td>3.75</td>
<td>3.74</td>
<td>3.81</td>
<td>3.59</td>
<td>3.67</td>
<td>3.66</td>
<td>3.64</td>
</tr>
<tr>
<td>Hum/Arts</td>
<td>3.52</td>
<td>3.51</td>
<td>3.42</td>
<td>3.57</td>
<td>3.63</td>
<td>3.43</td>
<td>3.46</td>
<td>3.62</td>
<td>3.54</td>
<td>3.4</td>
</tr>
<tr>
<td>Life Sci</td>
<td>3.52</td>
<td>3.56</td>
<td>3.35</td>
<td>3.55</td>
<td>3.44</td>
<td>3.43</td>
<td>3.54</td>
<td>3.53</td>
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</tr>
<tr>
<td>Psychology</td>
<td>3.43</td>
<td>3.49</td>
<td>3.63</td>
<td>3.79</td>
<td>3.33</td>
<td>3.69</td>
<td>3.72</td>
<td>3.84</td>
<td>3.62</td>
<td>3.69</td>
</tr>
<tr>
<td>All</td>
<td>3.56</td>
<td>3.5</td>
<td>3.53</td>
<td>3.55</td>
<td>3.54</td>
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<td>3.48</td>
<td>3.55</td>
<td>3.48</td>
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</table>
At the beginning of the Fall 1999 semester, the College of Education (coe) at Texas A&M University (tamu) reviewed various aspects of its operations as part of a comprehensive evaluation process. One area of interest and concern was graduate student admissions because 30 percent of the students admitted to graduate programs that semester failed to register for classes. As part of the overall review, the authors, the students, and professor of a graduate class in program evaluation in the Educational Psychology Department conducted an evaluation of the graduate admissions process within the College. The goal of the evaluation was to identify problems in the admissions process and suggest ways to address the problems in order to lower the number of no-shows. This article is intended to be an example of an approach to evaluation that can be conducted by administrators in higher education to address graduate admissions problems within their institutions.

Related Literature
Sixty years of literature on graduate student recruiting can be summarized in two words: interpersonal communication. Successful recruiting strategies engage students on an individual level, alleviating concerns regarding relationships with faculty, peers, and family.

Reeves (1932) noted that “the six most important factors are, in descending order, nearness of the institution, acquaintance with other students attending, subject-matter interest, parental wishes, less expensive, and influence of friends or relatives” (p.67). Students select the university that provides the optimal balance between personal and academic interests.
Chapman (1981) identified college characteristics such as size, location, academic reputation, and cost as influential in a student’s decision regarding university selection. However, Chapman also presented the influence of significant others, family, friends, and alumni on the decision-making process. Furthermore, the college’s communication efforts, mailings, brochures, and advertisements were important factors in college selection. Cowell (1985) stated that personal contact, whether through other students, or staff and faculty, is the most important thing universities can do for effective recruiting, while following up on student questions, applications, and letters of acceptance helps to increase the number of students who enroll.

Stout and Channell (1987) reported that “Ohio State University was able to reduce the decline in its enrollment with brochures and direct mail solicitations” (p. 29). A university can improve graduate admissions through attentive tracking and follow-up with potential students.

Kellaris and Kellaris (1988) noted that successful recruitment strategies require active student participation, such as campus visits, unsolicited mailings, and telemarketing. Webb (1993) identified fifteen variables influencing graduate business students’ college selections: academic reputation; accreditation; evening classes; programs; potential degree marketability; part-time programs; completion time; proximity (distance from home or workplace to school); tuition, books, and fees; faculty contact time; location (downtown, suburb, or in-house); library size; reputation in the community; parking; and placement reputation (p. 38).

As with previous research, faculty attention, location, and expense are factors that have an effect on university selection. Cleave-Hogg, McLean, and Cappe (1994) identified large class size, location, and the cost of living as contributing to students’ declining offers of admission. They state that “familiarity with the university and the community, established living arrangements, and a reluctance to uproot themselves were important considerations for these applications” (p. 106).

Graduate Advisor Interviews
In order to learn the procedures, guidelines, and restrictions of the admissions process in each department, the authors interviewed the graduate advisors of each department in the College of Education. Table 1 below summarizes the admissions process by departments.

<table>
<thead>
<tr>
<th>Table 1.</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>1. Initial contact by applicant</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>2. Information/application packet sent</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>3. Application to admissions office and department</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>4. Application to admissions office and department</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>5. Departmental deadlines are flexible</td>
<td>No Yes No Yes Yes</td>
</tr>
<tr>
<td>6. Departmental/program review/decision</td>
<td>✓ ✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>7. Written notification</td>
<td>✓ ✓ ✓ ✓</td>
</tr>
<tr>
<td>8. Written and verbal notification</td>
<td>✓ ✓ ✓</td>
</tr>
<tr>
<td>9. Follow up procedure after admission</td>
<td>Yes No Yes Yes No</td>
</tr>
</tbody>
</table>

INITIAL CONTACT AND INFORMATION DISSEMINATION
Although all departments responded with information and application packets to potential applicants, only two had active recruiting or advertising programs. Many inquiries to these departments were the result of a COE Open House, faculty presence at conferences, and Internet Web pages.

DEPARTMENTAL ADMISSIONS CRITERIA
All departments required GRE scores and undergraduate GPA from applicants. However, minimum GRE scores and GPA for admission varied across and within departments. Minimum requirements are program decisions.

Dept. 1. All department faculty had a say in the graduate admissions process except in the Student Affairs Administration in Higher Education (SAAHE) program, where only SAAHE faculty participated in the selection process. All applicants were interviewed. Doctoral applicants were also required to make an oral presentation. All applicants received written notification of acceptance. The SAAHE cohort received both written and verbal notifications.

Dept. 2. The faculty reviewed applications on a monthly basis. Acceptance letters were sent to those approved by departmental faculty after the university admissions office approved them.

Dept. 3. In addition to GRE and GPA information, applicants submitted personal statements and letters of recommendation. Some programs required interviews. Applications were reviewed by program faculty only, and notification procedures varied by program. Although all accepted applicants received written notification, some also received telephone notification.

Dept. 4. If the area of interest for master's degree applicants matched the interests of a faculty member (who became the graduate advisor), the applicant was accepted into a thesis option. If there was no area of interest match with any of the faculty, the applicant may have been accepted as a non-thesis student. If the area of interest for doctoral students matched the interests of one of the faculty and that faculty member wanted to advise the student, the applicant was accepted. If there was no interest match, the applicant was rejected.

Dept. 5. According to the graduate advisor, the admissions process had greatly degenerated. Admissions went on throughout the year and deadlines were flexible. Doctoral applicants had to make a presentation and be interviewed; master’s applicants had just the interview. Notification letters were mailed a week after the faculty made the admissions decisions.

FINANCIAL SUPPORT
In Department 1, SAAHE students received assistantships in different departments around campus while K-12 and higher education students would receive assistantships in the department. Department 3 actively sought financial assistance for its doctoral students. In Department 4, students applied for assistantships. All departments submitted student names for university fellowships; Department 3 had ongoing fellowship grants. Only one program in Department 3 gave notice of financial assistance at the time of notification of acceptance. Departments 2 and 5 did not provide information on financial assistance.
EVALUATION PROCEDURES

Various options for getting the information needed to accomplish the evaluation were considered: only mail, only telephone, a mixture of both, and both together. The authors decided on a mixture of telephone and mail surveys: mail for international addresses, and telephone for U.S. addresses. It was anticipated that many U.S. non-registrants had moved. However, it was believed that some of them could be found through online telephone white pages.

NAMES VS. NUMBERS

The Dean of the College of Education was briefed on the survey plans, which were subsequently approved. It was requested that the Dean’s office obtain from each department the names, addresses, phone numbers, and intended programs for all students who had not registered. The information was received slowly (it took until November 19, 1999, to get the names from one department), which delayed conducting some of the surveys. The departments also provided far fewer names than the number reported as no-shows by the Student Information Management System (SIMS), which indicated problems in student tracking.

DATABASE

As the names came in from the departments, they were entered into a Microsoft Excel database. As information was received from surveys, it also went into the database. Details received included confirmation of departmental information such as the program for which the person had been approved, whether the person planned to register at TAMU in the future, reasons for not registering, if the person was attending another institution of higher education, what had caused him or her to pick that institution, comments on the TAMU admissions process, and comments on the survey.

SURVEYS

The first letters to U.S. recipients and the mail surveys for overseas students were mailed on October 22, 1999. Letters were sent to other U.S. recipients as their names were received from the departments. The letters to U.S. recipients indicated they would be contacted by phone in about a week and asked to answer a few questions. Each team member was assigned to call several non-registrants. It was decided that members would try to contact non-registrants five times before declaring them lost and not reachable by phone. At that point a mail survey would be sent with a follow up card seven days later. Efforts to locate students through online white pages proved fruitless.

Results

RESPONSES

Students with International Addresses

SIMS data indicated that 34 students with international addresses were accepted into the various departments in the COE. Of those, 18 registered for Fall 1999 classes. There was no contact information for one of the sixteen non-registering students. Mail surveys went to the remaining fifteen non-registrants. The mail survey was to have included an international return mail coupon, but the return mail coupons were overlooked and the questionnaires were mailed without them. One survey was returned as undeliverable, and none of the others were returned.

Students with U.S. Addresses

While the SIMS data showed 118 students with U.S. addresses did not register, departments furnished only 64 names. Team members tried to contact these individuals first by telephone, and thereafter by mail survey. Twenty responses (31 percent) were received from among these 64 students, twelve through telephone surveys, and eight through mail surveys.

Response Data

Reasons for not registering for the Fall 1999 semester are shown in Table 2. The team originally planned to perform a latent partition analysis to categorize the responses, but the small number of responses made it possible to categorize the responses easily. Responses are generally consistent with the findings detailed in the literature review.

<table>
<thead>
<tr>
<th>Table 2. Reason for Non-registration</th>
<th>Department</th>
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</thead>
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<td></td>
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</tr>
<tr>
<td>Financial assistance better at other university; Texas A&amp;M non-committal about financial assistance</td>
<td></td>
</tr>
<tr>
<td>Location; no distance learning courses</td>
<td>1</td>
</tr>
<tr>
<td>New job; family concerns</td>
<td></td>
</tr>
<tr>
<td>Better programs at other school</td>
<td>1</td>
</tr>
<tr>
<td>Dissatisfaction with treatment by COE personnel</td>
<td></td>
</tr>
<tr>
<td>Did not want to participate in survey</td>
<td></td>
</tr>
<tr>
<td>Will enroll in University in Spring 2000</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>1</td>
</tr>
</tbody>
</table>

Conclusions

Even when TAMU was the non-registrants’ first or second choice, offers from other universities were accepted because:

- COE was too slow to notify individuals they had been accepted;
- COE was noncommittal or not as generous as other universities regarding financial aid;
- TAMU location was inconvenient for family, employment, and academic opportunities; and
- The reputation of academic programs and university resources was better at other universities.

In summary, non-registrants selected universities that responded promptly with acceptance decisions and financial aid offers. Furthermore, non-registrants selected universities that did not require the individual to commute or relocate.

The evaluation team believes these findings are applicable to large public colleges and universities. Large metropolitan universities may have different pools of applicants due to proximity that changes the appropriateness of our findings for their
situations. While colleges and universities have no control over location, they do control certain other fiscal and administrative aspects of the admissions process applicable to all large universities.

Recommendations
The evaluation team recommended to the Dean of the COE that several actions be taken by the Dean’s office as well as by the graduate advisor and head of each department. These included establishing a database to track all student applications, establishing more responsive admissions procedures within the COE, ensuring year-round points of contact for graduate student admissions inquiries, pursuing additional funding for graduate scholarships and graduate assistantships, and vigorously developing more course offerings via distance learning.

Summary
As a project for a graduate class in program evaluation, this study provided an excellent opportunity for the students to learn by doing. It also provided a valuable service to the COE by highlighting several strong points and a number of weak points in the admissions situation within COE departments. The recommendations provided by the evaluation team, if accepted and put into practice by designated personnel within the COE, would strengthen the admissions process and give it the higher visibility by COE decisionmakers it needs to more effectively and efficiently meet the future admission needs of the College. The low cost—$115—of conducting this evaluation would make it worthwhile to conduct a follow-up evaluation after recommendations are implemented to see whether new practices made a difference in registration rates.

References

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It has been widely reported that the Scholastic Assessment Test in Mathematics (SAT-M) is a poor predictor of women’s success in college (Linn and Kessel 1996; Stricker, Rock and Burton 1993; Wainer and Steinberg 1992). Leonard and Jiang (1995) found that a “small” gender difference in predicted grades for Berkeley freshmen admitted between 1986 and 1988 resulted in excluding 200 to 300 women per year who would have been admitted to its freshman classes if unbiased predictors had been used. The Admissions Department at Massachusetts Institute of Technology (MIT) found that it was admitting more men to the school but that women were earning higher grades. To remedy the situation, MIT began to admit women with scores below the previous cut-off of 750 on the SAT-M. As a result more women were admitted and the gap between grades for men and women decreased (Johnson 1993). At both MIT and Berkeley, the predictor variable that caused biased admissions was the SAT-M.

Several studies have found that the SAT-M combined with entrance examination scores, placement tests, and/or information from the high school record is a better predictor of success in college mathematics courses than the SAT-M alone (Bridgeman and Lewis 1996; Bridgeman and Wendler 1989, 1991; Odell and Schumacher 1995). The mathematics department at the Northwest university where the current study was performed includes the SAT-M as one of four variables in its predictor equations used for placement of students in their first freshman-level mathematics course.

During 1997–98, we researched whether the gender bias found in SAT-M scores was effectively neutralized by the three other variables in the university’s predictor equations. Bias in this four variable system would indicate potential bias at other colleges that use similar methods for mathematics placement.

There were three objectives for this study: First, determine if the SAT-M variable was the cause of the bias if it existed; and third, determine the effect of the other three predictor variables in the over/under prediction of actual grade average.

Mathematics Placement System

The purpose of the mathematics placement system is to determine the freshman mathematics courses in which a student is likely to be successful with an appropriate amount of hard work. Prior to registering for the first freshman mathematics course, the student must complete a survey and take the mathematics placement test. The first part of the instrument is a survey where students report the most advanced mathematics class they have taken and the grade they received in that course. The second part of the instrument is a multiple choice, computational mathematics placement test designed by the university’s mathematics department. The placement test is scored differently for each of four freshman mathematics courses. The scoring is based on statistical findings concerning the test questions and student performance. That is, those questions which are useful in prediction of successful performance in a course receive a high number of points for that course and those questions which are not useful in prediction of successful performance receive low or zero point weight for that course. The three variables—past highest mathematics course, grade, and placement test score for a particular course—are used together with the SAT-M to predict success in each of four freshman-level courses. Each student is given a predicted grade for each entry-level course.

Celine D'Souza Dorner is Chair of the Mathematics Department and Mathematics Placement Director at Pacific Lutheran University, Tacoma, Washington.

Ivan L. Hutton, Associate Dean and previous director of the Educational Leadership doctoral program in the School of Education at Seattle University, Seattle, Washington.
Formulas to calculate predicted grade were developed for each freshman course using regression methods to optimize the correlations between the predicted grade and the actual grade. For example, the predictor equation for Business Calculus was:

\[
\text{PredictedGrade} = -1.88 + 0.0238(\text{TestScore}) + 0.00218(\text{SAT-M}) + 0.319(\text{PrevMath}) + 0.265(\text{PrevMathGrade})
\]

Analysis of the predicted grades for each course, together with student reported survey information such as intended major and confidence in mathematics, determine eligibility for several freshman mathematics classes. The student then decides which course to take.

**Study**

The current study included almost all students who entered the university from Fall 1991 through Fall 1996 and took the mathematics placement test. Students who did not have SAT-M scores or who had taken their first freshman-level math class for a pass/fail grade were not included. Of the remaining 1,388 students, 678 were women and 710 were men. Each of these students took either College Algebra, Business Calculus, Pre-Calculus or Calculus I. The total number of males in all sections of each course ranged from 110 to 279, and the total number of females in all sections of each course ranged from 107 to 219.

The authors gathered all data from the university’s archived student records, which included both computer and hardcopy files.

**FIRST OBJECTIVE**

The first objective was to learn whether the mathematics placement system was systematically over-predicting or under-predicting actual grades for each gender.

**Method:** The study used a combination of descriptive and inferential statistics, paired t-tests [predicted to actual grade] and unpaired t-tests [female to male], ANOVA, and non-parametric tests. Descriptive and inferential statistics were used to analyze gender differences of actual grades within each mathematics course.

To determine the over- or under-prediction of grades of each gender, mean grade differences (predicted grade minus the actual grade) were analyzed using paired t-tests within each mathematics course. If the predicted grade mean was lower than the actual grade mean, the difference would be negative, indicating under-prediction. If, however, the predicted grade mean was higher than the actual grade mean, the difference would be positive, indicating over-prediction. An unpaired t-test compared mean differences between the grade means of women and men within courses. This test indicated whether the placement system was predicting grades differently for men and women.

**Results:** A comparison of predicted and actual grades (predicted - actual) is presented in Table 1. In all courses other than Calculus, women are under-predicted at a statistically significant level. In College Algebra the under-prediction is by almost half a grade. The men are over-predicted at a statistically significant level in Calculus. The unpaired t-test comparing grade means (predicted - actual) of women with those of men shows a statistically significant difference for each course except Calculus. The difference ranges from about a fifth of a grade in Business Calculus to about a third of a grade in Pre-Calculus and College Algebra.

The results indicate that this mathematics placement system predicts grades differently for men than it does for women. In other words, there is gender bias in the system.

**SECOND OBJECTIVE**

Since it is already documented that use of the SAT-M alone for mathematics placement causes gender bias in grade prediction, the second objective was to examine bias when the SAT-M is used in conjunction with the other predictor variables.

**Method:** First, descriptive statistics and unpaired t-tests at significance level 0.05 were used to compare SAT-M scores of women and men.

Next, two multiple regressions were performed and compared in order to determine if the SAT-M variable was the only variable that contributed to gender bias. In the first regression (without SAT-M), the dependent variable was the actual grade and the independent variables were gender (coded 0 for females and 1 for males), placement test score, previous mathematics course, and previous mathematics grade. The second regression was identical to the first except that SAT-M was included as an independent variable. The size of the gender coefficients and the resulting p-values in the regression analyses would indicate whether there was any bias when the SAT-M was used in conjunction with the other predictor variables.

**Results:** Table 2 shows counts, means, and standard deviations of SAT-M scores for women and men. Results of unpaired t-tests show whether mean differences of SAT-M scores between men and women are significant (p<0.05).

SAT-M score means for men are above score means for women in every course. However, the table also shows that when men’s and women’s mean scores are compared, the differences are significant only in Business Calculus. Women scored

<table>
<thead>
<tr>
<th>Course</th>
<th>Females (paired t-test)</th>
<th>Males (paired t-test)</th>
<th>Females-Males (unpaired t-test)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pred-Actual Mean</td>
<td>p-value</td>
<td>Pred-Actual Mean</td>
</tr>
<tr>
<td>Col. Alg.</td>
<td>-0.459</td>
<td>&lt;.0001*</td>
<td>-0.102</td>
</tr>
<tr>
<td>Bus. Calc</td>
<td>-0.129</td>
<td>0.035*</td>
<td>0.058</td>
</tr>
<tr>
<td>Pre-Calc</td>
<td>-0.187</td>
<td>0.044*</td>
<td>0.172</td>
</tr>
<tr>
<td>Calculus</td>
<td>0.032</td>
<td>0.629</td>
<td>0.177</td>
</tr>
</tbody>
</table>

*significant grade difference by gender (p < 0.05)
38 points lower than did men. There is no obvious explanation for the difference in this particular course.

Regression test results (Table 3) indicate that in all courses the gender difference increases when the SAT-M variable is added in the regression. For example, in College Algebra the gender coefficient is \(-0.292 (p = 0.029)\) without SAT-M and \(-0.339 (p = 0.010)\) with SAT-M.

These regression tests also show that the gender variable with or without the SAT-M variable has a negative coefficient. In College Algebra and Pre-Calculus, the tests with or without the SAT-M variable indicate that the women do better than the men with the same predictor variables by about a third of a grade point. Notable, also, in the first regression without the SAT-M as an independent variable, is that there are negative gender coefficients for all courses. This indicates that there may be other variables used in the predictor equation that also contribute to the under-prediction of grades for women.

**Third Objective**
The third objective of the study emerged as an unexpected product of the SAT-M analysis (Table 3). This new objective was to determine if there was a gender effect in any of the other three variables (placement test score, previous mathematics course, and previous mathematics course grade) used to predict the grades for each of four freshman mathematics classes.

**Method:** Two statistical models, the parallel model and the interaction model, were used separately on each of the three parallel line model the gender grade difference is constant for each model where the vertical axis represents the actual grade, and allows one to immediately note the effects of gender. In the parallel line model the gender grade difference is constant for each point. Notable, also, in the first regression without the SAT-M variable is that the women do better than the men with the same predictor variables by about a third of a grade point. Notable, also, in the first regression without the SAT-M as an independent variable, is that there are negative gender coefficients for all courses. This indicates that there may be other variables used in the predictor equation that also contribute to the under-prediction of grades for women.

**Parallel Model Test**
Separately, for each of the three predictor variables (placement test score, previous mathematics course, and previous mathematics course grade) multiple regression was used to analyze the relationship of actual grade to the predictor variable together with gender. An example of a regression equation using the placement test score predictor variable is:

\[ \text{Actual grade} = B_0 + B_1\text{Gender} + B_2\text{Testscore}; \] where \(B_0, B_1, B_2\) are real numbers. \(B_0\) is the y-intercept or constant, \(B_1\) is the coefficient for gender and \(B_2\) is the coefficient for test score.

Since gender is coded as zero for women and one for men, this regression model quickly allows us to note the gender effects from the coefficient of gender. For example, for College Algebra, the regression equation using placement test score was:

\[ \text{Actual grade} = 1.319 - 0.372\text{Gender} + 0.056\text{Testscore} \]

This equation shows that men with the same placement test score as women obtain a grade approximately 0.372 lower than the women's grade.

**Results:** Tables 4, 5, and 6 display the gender coefficients and p-values for the other three non-SAT-M predictor variables: Placement Test Score, Previous Math Course, and Previous Math Course Grade.

In Table 4, the p-values for the gender coefficients indicate statistical significance in all courses. This statistical analysis
shows that there is a gender effect using the placement test scores to predict a course grade for a student.

There is a significant gender effect if the previous mathematics course is used as a predictor variable (Table 5) for three of the four first college math course grades. In College Algebra, Pre-Calculus, and Calculus the parallel model shows a significant gender difference in actual grade with the same previous math course. The women's mean actual grades were half a grade point higher than the men's mean actual grade in College Algebra and Pre-Calculus.

In Table 6, the significant negative gender coefficients for all but the Business Calculus course indicate that women with the same grade as men in a previous mathematics course do better than men in their first college mathematics class. In Pre-Calculus, women earn a third of a grade higher than men with the same previous mathematics grade, and in College Algebra the difference is close to half a grade.

In general, women earn a higher actual grade in their first college mathematics class than men with the same placement test score, previous mathematics course, and previous mathematics grade. Thus, each of these added “independent” variables under-predicts actual performance of women and over-predicts the actual performance of men.

**Summary**

While previous studies have recommended using multiple predictors rather than the SAT-M alone to improve grade prediction in college mathematics (Bridgeman and Lewis 1996; Bridgeman and Wendler 1998; Odell and Schumacher 1999), the results of this study show that multiple predictors add to the gender bias of the SAT-M. In this study, not only the SAT-M, but the placement test score, previous mathematics course, and previous mathematics course grade variables resulted in overestimating grades of men and underestimating grades of women in College Algebra, Business Calculus, Precalculus and Calculus courses. Within a given mathematics course, the average grades of women were about a fifth of a grade point to half a grade point higher than the average grades of men.

The findings in this investigation have several limitations. The study is limited to a single medium-sized, independent university, and the student population was limited to a five and a half-year period from Fall 1991 through Fall 1996. Students who had missing SAT-M scores or took their first freshman mathematics course pass/fail were excluded. The typical student who does not have an SAT-M score is either an international student or a returning older student, so our results may not apply to those populations.

Two theories to reduce gender difference will be investigated in the near future at this institution. One theory suggested by Bridgeman and Lewis (1996) and Bridgeman and Wendler (1998), is that the inclusion of high school grade point average or class rank variable may help compensate for the gender bias of other variables. Other studies have suggested using two different predictor equations, one for each gender (Linn 1973, 1977; Odell and Schumacher 1999).

**Relevance to Other Colleges and Universities**

The regional and national wide-spread use of internally developed or commercially purchased math placement tests underscores the importance of determining if math placement tests might, in fact, contain gender bias. In Fall 2000, one of the authors conducted an informal telephone and e-mail survey of math departments in most of the colleges and universities in the state of Washington and many in the state of Oregon. The following math placement practices were discovered: 1) public colleges generally use commercially developed math placement tests, 2) public universities use internally developed math placement tests, 3) private colleges and universities use internally developed math placement tests or no math placement tests.

The following information was gathered from math placement developers or distributors. Prior to June 2000, approximately 180 higher education institutions across the United States were using FTP, the Mathematical Association of America’s Placement Test Program. In Fall 2000, approximately 600 United States colleges and universities were using the online and windows-based ASSET (Accuplacer Entry Skills Assessment Test) Exam produced by The College Board for math placement, and 800 colleges and universities were using the COMPASS (Computer Adaptive Placement Assessment and Support System) placement exam by ACT (formerly named the American College Testing Program).

**Recommendations**

All colleges and universities that use a regression formula approach to predicting student success for placement of students in math courses are strongly recommended to test for
gender bias in all independent variables used in their regression formula. In particular, all colleges and universities that use a math test developed in-house are strongly encouraged to test it for possible gender bias.

Additionally, the results of this study sound a cautionary alarm to departments and administrators that use not only the SAT-M, but also other variables to admit, place, predict, or assign scholarships to students.

References

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In the education policy arena, increasing coordination and collaboration between elementary, secondary, and higher institutions of learning has long been a topic of discussion and priority for reform. Over the years, this issue has evolved considerably and has developed many catchphrases, such as “seamless education” or “p-20 education.”

Recently, attention in this area of policy has focused on the final year of high school as a fundamental point of disconnect in the educational system. Researchers and policy analysts point to this crucial period as one that most clearly embodies the shortcomings of the education system as it is currently configured. Following that lead, the popular media have also seized on this phenomenon, bemoaning the “loss” of the senior year through accounts such as the following:

“Senioritis, or senior slump, has become so severe that soon we might have to drop the pretense and say high school lasts three and a half years, followed by a six-month break. A training-wheels sabbatical” (Herring 2001).

These issues have also attracted the interest of the policymaker community, with former Secretary of Education Richard Riley appointing the National Commission on the High School Senior Year in June 2000. The Commission (2001), composed of local, state, and national policymakers and education leaders, was charged with exploring the following four questions:

1. To what extent is there a convergence in expectations for students going to college and those going directly into the workforce?
2. What is the nature of the disconnect between K-12 and postsecondary education that leads to large numbers of students needing remediation and not successfully completing postsecondary degrees?
3. What is different about the disconnect for students entering the workplace (whether they begin working immediately out of high school or after they finish postsecondary education)?
4. Could changes be made in how we structure the existing twelve years of schooling to increase achievement for all students at the end of their senior year?

Despite the emphasis implied by the Commission’s name, its work has reached far beyond the senior year. Its primary findings will not surprise most education observers—the secondary education experience is failing too many students, regardless of their ambition, and there is a glaring lack of communication between K-12 and postsecondary education and between the education community and the private sector.

However, the timing of this message should give pause to policymakers and education leaders. The Commission’s troubling observations come at a time when education’s social and economic capital is reaching an all-time high, driven by the shift to an information-centered society. Where pundits and the general public were questioning the value of universal postsecondary education just a generation ago, today the vast majority of Americans see some form of post-high school learning as an absolute necessity for their children. In short, the stakes in education are higher than ever before, and rhetoric not backed by real progress will not only leave our nation’s children behind, but will potentially compromise our economic and geopolitical strength. While the policy community is engaging some of the issues raised by the Commission, others beg to be addressed, and serious discussions about these issues are long overdue.

Key Findings: The National Commission on the High School Senior Year

The Commission released its final report in Fall 2001, after reviewing hundreds of pages of analysis and holding public hearings and focus groups nationwide. Its work reiterates and
The academic performance of American seniors is alarmingly low in key subject areas. The roots of this performance lag reach all the way through the high school years, and leaves seniors at a competitive disadvantage with their international counterparts. For example:

- According to the National Assessment of Educational Progress (NAEP), 23 percent of 12th graders scored “below basic” proficiency in reading in 1998. This represents a slight improvement over 1994 levels, but a loss over 1992 levels.
- NAEP also found that 22 percent of 12th graders scored “below basic” proficiency in mathematics in 1998.
- In mathematics, NAEP found that nearly one-third of seniors (31 percent) did not reach basic proficiency in 1998, which is actually an improvement over previous years.
- More than one-third of seniors in 1998 (35 percent) failed basic proficiency in civics, according to NAEP (National Center for Education Statistics 2000).

Such performance places American students at competitive disadvantage, as suggested by the following:

- The Third International Mathematics and Science Study (TIMSS), conducted in 1995, found that among final-year secondary students in 21 countries tested in mathematics, American students ranked 19th (besting only Cyprus and South Africa).
- TIMSS also found that in advanced mathematics and physics, final-year students in the U.S. scored 15th out of 16 nations, outperforming only Austria (National Center for Education Statistics 2000).
- While the U.S. once led the world in the percentage of young people earning a secondary credential on time, it currently ranks 17th (The Education Trust 2000).

More significantly for the policymakers and analysts, this lag appears to develop over the course of the secondary school years:

- According to NAEP, American students post greater learning growth (via increased scores) in reading and mathematics in grades 5-8 than in grades 9-12. In reading, math, and science, learning growth for 17-year-olds has slowed in recent years.
- On international comparisons of math proficiency, U.S. students post scores above the international average in Grade 4, slip below the international average in Grade 8, and significantly lag behind the international average by Grade 12. A similar pattern emerges in comparisons of science proficiency (National Center for Education Statistics 2000).

As a result, an alarming proportion of students are under-prepared for the demands of postsecondary education and the workplace. For example:

- Just over one-quarter of first-time, full-time freshmen (29 percent) enrolled in reading, writing, or math remedial courses at American colleges and universities in Fall 1995. This percentage is higher at public two-year institutions (41 percent) and lower and public and private four-year institutions (22 percent and 13 percent, respectively).
- More than one-third of the postsecondary institutions sampled in Fall 1995 (39 percent) reported that enrollment in remedial education had risen at their institution over the past five years, while just under half (47 percent) indicated that remedial enrollment levels had remained constant over the period. At public two-year institutions, a majority of respondents (55 percent) reported an increase in remedial enrollment (National Center for Education Statistics 1996).
- According to the American Management Association (AMA), deficiency rates on employer-offered proficiency examinations currently hover around one-third of applicants (34 percent in 2000).
- The AMA also found that employers are less likely to offer programs to remedy skill deficiencies. In 2001, 12 percent of employers offered remedial programming, compared with 24 percent in 1993 (American Management Association 2001).

Secondary schools

What is behind this nagging performance gap? While it is difficult to precisely gauge cause and effect in this area, a number of contributing factors present themselves. Secondary schools are:

- Overtaxed. In several respects, student demand far outstrips high schools’ ability to provide quality guidance and instruction. According to The Education Trust (2000), the percentage of secondary instructors teaching in a given subject area without the equivalent of a college minor in that area (out-of-field placement) ranges from 18 percent in social studies and science to 28 percent in mathematics. In most of the primary areas of teaching practice (content, pedagogy, classroom management, parent relations, etc.), a strong majority of public high school teachers spend one to eight hours per year engaged in professional development activities (National Center for Education Statistics 2001). Additionally, estimates of counselor to student ratios hover in the 500 range, a level that does not even begin to permit meaningful student advising on academic and career options (National Commission 2001).
- Outmoded. The Commission (2001) cogently argues that the American high school model, in which students are essentially sorted into academic and non-academic tracks, is simply not suited to the demands of an information-driven economy. As noted workforce expert Anthony Carnevale explains, technology is acting as a leavening agent throughout the economy, distributing empowerment through the economic structure. As a result, proficiency in key skill areas (especially those related to
accessing, digesting, and manipulating information) is now required, regardless of educational or occupational aspiration.

Additionally, and perhaps more importantly, the time-honored practice of measuring student progress according to “seat time” and credit accumulation renders the secondary system “a prisoner of time,” holding time constant and allowing educational quality to vary. Accordingly, the current system leaves many students unchallenged and contributes to wasted time. Student focus groups held by the Commission underscore this indictment:

“I only had to take two classes because we only had to have 18 credits... so my senior year was a waste of time.”

“It [the senior year] should be your most focused... But instead I think a lot of it gets looked at as, oh, my last year. I have my credits, or whatever, so I think a lot of people do that, and then when you are in what they call the real world, things hit people like a ton of bricks” (Fleishman-Hillard Research 2000).

The growing interest in programs such as dual/concurrent enrollment strongly suggests a need for continued exploration of alternatives to the existing approach to student progression. These alternatives will not be without their own challenges, but will be necessary to liberate the secondary system from the clock and calendar. The bottom line—too many students have too much time on their hands, and little of it is being used to prepare for the next career step, academic or otherwise:

- One-third of American students do not take a math course during their senior year, and two-thirds do not take a science course during their final year.
- Almost one-quarter of the nation’s 17 year-olds read less than five pages per day in school or for homework (National Commission 2001).
- Just over one-third of first-time, full-time freshman students sampled in 2000 (35.2 percent) said they spent less than two hours per week on homework during their senior year, while nearly two-thirds of students (65 percent) reported spending less than five hours per week on homework during their final year (Sax et al. 2000).
- Half of the first-time, full-time freshmen sampled in Fall 2000 indicated that they worked at least ten hours per week in a paid job during their senior year (Sax et al. 2000). According to the Commission (2001, p. 16), “No other advanced country expects students to work, or permits them to work long hours at low-skill jobs just to earn spending money.”

The relationship between the education system’s providers and stakeholders is marked by a lack of communication and coordination. This is certainly the most frequently cited problem in contemporary policy discussions, with prognostications and proposed solutions in ample supply. It is also perhaps the most deeply rooted of the system’s problems, owing to Americans’ strong philosophical bent toward local control in educational matters and the fact that it plays out on several levels:

**Disconnect within educational sectors.** Though frequently overlooked in policy circles, this is perhaps one of the most troubling problems since inter-sector initiatives cannot succeed without significant intra-sector consensus. For example, a majority of the high school teachers surveyed by the Southern Regional Education Board (SREB) reported that they never interact with their elementary and middle school colleagues on the crucial issue of curricular alignment. Equally as troubling, the survey revealed that only about one-third (37 percent) of the middle school teachers sampled saw preparing their students for a college prep curriculum as “very important” (National Commission 2001).

**Disconnect between educational sectors.** In the present as in the past, the chasm between elementary/secondary and postsecondary education serves as the focal point for education leaders and policymakers. The Commission weighed in on this front, declaring:

“Current governance structures impede meaningful collaboration between K-12 and higher education. In many states, leaders of the two systems rarely (if ever) meet. Many leaders on each side feel they have little in common. They receive little encouragement to collaborate and may even have incentives not to because their interests, in such matters as public funding, often conflict” (National Commission 2001, p. 28).

This disconnect appears to have only been compounded by the accountability movement, which illustrates the law of unintended consequences at work, as the Commission warns:

“Assessment may turn out to be the Achilles’ heel of the reform movement. Students may easily encounter four different sets of requirements governing what they need to do to graduate from high school, be admitted to college, be permitted to enroll in credit-bearing college courses, or get a job” (p. 26).

In a report prepared for the Commission, Dr. Michael Kirst (2001) of the Bridge Project at Stanford University concurs with this finding, asserting that “high school students face a Babel of assessments.” Research by the Bridge Project supports this contention, citing California as an example. There, the state administers six different assessments in K-12, while its colleges and universities employ seven. An analysis of the California assessments by the Rand Corporation found significant misalignment among them, owing in large part to curricular reforms that have taken hold in one sector and not another. Additionally, Algebra I comprises about 47 percent of the math component of the SAT (a primary admissions metric at many colleges and universities), but only 25 percent of the math component of Accuplacer (a privately developed college placement test). Under such circumstances, it is not difficult to see how students can fall through the cracks in moving from one segment of the education system to another.

**Analysis**

Even though the Commission’s final report is not expected to yield bold advances in understanding the problems plaguing the
senior year, an examination of its preliminary findings yields some important observations:

1. **Real progress in bringing seamlessness to the education system and reclaiming the senior year is as much about intra-institutional reform as it is about inter-institutional collaboration.** In other words, curing what ails the educational system will require a large dose of “heal thyself” among the system’s various elements. This is difficult, because it is very tempting in the policy world to assert that K-12 has failed higher education through poor student preparation, that higher education has failed K-12 through poor teacher preparation, that the education system has failed the private sector through both, and that greater linkage and collaborative programming is the place to start. While reform in this area will fail without meaningful partnerships, the first steps should be taken within the sectors involved, acknowledging ownership and taking action as sectors to correct problems.

**K-12 education must take responsibility for its own curricular alignment and the optimal structuring of the senior year experience.** The Commission makes it clear that the shortcomings of the senior year mark the culmination of problems that fester throughout the high school period, and perhaps take root in the transition from middle school. Reviewing and revamping the academic core of the secondary system is the responsibility of the public schools, and will be essential for improving the handoff to postsecondary education and/or the workforce. **Higher education must take responsibility for remedying the persistent disconnect between student access and success.** This gap begins with assessment, where (as shown above) metrics for admission bear little resemblance to the metrics for placement. This gap is widened through other admission criteria, many of which simply do not say enough about students’ preparedness for what lies ahead. Colleges and universities must send a clear message about which competencies are needed for academic success, which means substantially improving coordination between admissions offices and other departments on campus.

Additionally, higher education institutions must continue to strive for improvement in the area of student retention. A first-year attrition rate of 25 percent is simply not acceptable for four-year institutions. While there is promising research and experimentation currently underway in this area, much more remains to be done. As with many policy challenges facing colleges and universities, boosting retention and completion is a campus-wide responsibility.

Employers must communicate the rapidly emerging challenges and changes they face, especially in light of the economic evolution now underway. Given the trend toward less skill remediation in the workplace, the private sector will help its own bottom line by taking the initiative to engage schools and universities in their curricular planning processes. Additionally, and perhaps more importantly, employers can greatly contribute to reform efforts by amplifying the message to students that a casual attitude toward academics in high school (and especially in the senior year) will quickly make them a casualty of the New Economy.

2. **Lasting reform must go deeper than re-shaping or adding bureauscracy.** While it is true that governance structures and organizational dynamics have a lot to do with the current clumsiness of the handoff from K-12 to higher education and the workforce, these elements are not the sole causes. Accordingly, focusing exclusively (or even largely) on these elements will not bring about lasting and efficacious reform. In its work, the Commission clearly and eloquently articulated that some of our fundamental attitudes and assumptions about secondary education and its fit with contemporary society must be questioned. For example, attempting to reconfigure the high school curriculum without confronting the tradition of sorting students according to aspiration, or changing the mindset that a challenging senior year is not warranted if sufficient credits have not been accumulated, will bring relatively little in the way of results.

All of this is not to imply that work on improving organizations and relationships is not a priority or should not be pursued. In fact, one of the Commission’s principal findings is that “Institutions of higher education and K-12 schools collaborate insufficiently with each other to align academic content, admissions procedures, and expectations for students.” To this end, experiments with new entities such as a P-16 council in Georgia show significant promise for bringing much-needed coordination and communication to the education system. However, the very real danger exists that P-16 structures will become ends rather than means, consumed with process rather than policy. The challenge falls to state policymakers and education leaders to keep these entities focused on key reform issues.

A prime example of such an issue surfaces in the experimentation with competency-based high school assessments and college admissions standards. Several states, such as Colorado, Oregon, and Wisconsin, are currently piloting programs that measure student progress/readiness through the demonstration of basic competencies, rather than the simple fulfillment of credit/seat time requirements. Such an approach, which represents a challenge to fundamental tenets of the current educational system, holds significant promise for improving student preparation and smoothing transitions through that system. At the same time, however, the shift to such a system entails difficult questions, including:

- **Cost/Administration—** How can schools and universities design a competency-based system that does not bury instructors in portfolios and paperwork? How can education leaders convince state policymakers to make the initial resource investment in such a shift, which can be substantial?
Predictiveness—Will a competency-based assessment system improve the ability to predict and encourage student success enough to justify the investment?

Portability—Will states be able to develop competency-based systems that allow students to cross state lines and continue their education without significant interruption? In other words, can education policymakers avoid replacing the current “Babel of assessments” with another one (Conley 1999)?

In sum, reform related to the high school senior year should be guided by a principle of balance—balance between short-term actions and long-term initiatives, between changes in organization/structure and changes in attitude/approach. Effecting such a balance is critical, particularly in an era of term limits, ballot measures, and the changing face of the state/federal relationship on education issues.

Conclusion
As globalization proceeds and an information-driven society continues to take shape here at home, policymakers find themselves increasingly occupied with the question of competitiveness. How will our nation and its constituent states continue to grow and prosper in the face of the staggering change that is testing their creativity, ability to innovate, and even their values? In the search for answers to this question, there are few more urgent tasks than strengthening our human infrastructure byremedying the basic disconnects in our educational system. The work of the National Commission on the High School Senior Year underscores this urgency, and makes the point that in several key areas—revamping the high school curriculum to challenge all students, treating teaching as a profession, attending to student success as well as access—the time for talk has passed, and the time for action is at hand.

However, education leaders and policymakers should not fall into the trap of equating urgent with fast with respect to reform. Meaningful and lasting change will not take place in one legislative cycle, and significant change often entails organizational, political, and even professional risk. The stakeholders in any reform effort must be prepared to commit to the task for the long haul, and offer whatever protection they can to the risk-takers in their endeavor.

Colleges and universities, as prime players in an information-driven society, have a special responsibility in this realm. Where education reform issues are being seriously considered, institutional leaders have an essential role to play in engaging their campuses in the change conversation, and in articulating the campus perspective to other stakeholders. Where reform efforts are flagging, campus and system leaders have a prime opportunity to lead the push for a human infrastructure equal to the demands of the 21st Century. In either case, higher education must play an active role in framing the issues, identifying a balanced course of action, and following through. The stakes are simply too high to do otherwise.

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Fleishman-Hillard Research. 10 October 2000. Focus groups with selected high school graduates.


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What is a Diploma Mill?
Various definitions for diploma mills have been given over the years; however, the Director of the U.S. Department of Education has previously defined a diploma mill as:

“an organization that awards degrees without requiring its students to meet educational standards for such degrees; it either receives fees from its so-called students on the basis of fraudulent misrepresentation, or it makes it possible for the recipients of its degrees to perpetrate a fraud on the public.”

This is the definition used when I was a Special Agent for the Federal Bureau of Investigation (FBI) in charge of Operation Diploma Scam (DIPSCAM) from 1980-1991. I believe this definition is still viable today even with the advent of the Internet.

DIPSCAM
The Charlotte, North Carolina, office of the FBI conducted a series of investigations from 1980-1991 regarding alleged diploma mills operating throughout the United States and abroad, resulting in 39 convictions and the closing of over 50 purported colleges and universities.

It all began with a complaint that Dr. Alfred Q. Jarrette, president and founder of Southeastern University in Greenville, South Carolina, was selling degrees and transcripts. The citizen then purchased several backdated degrees with accompanying transcripts, which he then made available to the FBI. This information, along with the degrees and transcripts, were reviewed by the United States Attorney’s Office for the Western District of North Carolina, which in turn authorized the FBI to institute an investigation.

This citizen then introduced me to Dr. Jarrette, with whom I negotiated for the purchase and backdating of bachelor, master, and doctorate degrees. An amount was agreed upon and dates were selected for the respective degrees. I then obtained a cashier’s check for the total amount and mailed it to Dr. Jarrette.

Thereafter, another FBI Agent (Ron Rollins) was introduced to Dr. Jarrette, and he too purchased several degrees and transcripts. At this point, the Assistant United States Attorney handling this matter wanted to be in a position to later show a jury just how far Dr. Jarrette would go to perpetrate this fraud. So officials of North Carolina National Bank (now Bank of America) corresponded with Southeastern University and indicated that Ezell and Rollins had applied for job positions, and that the bank desired verification of their respective degrees. Dr. Jarrette then verified these degrees with NCNB and made glowing remarks about these two “graduates.”

At this same time, Dr. Jarrette invited his two new graduates to come to Greenville and be photographed in cap and gown with him at his university. Thus, we traveled to Greenville and visited with Dr. Jarrette at Southeastern University. The “University” occupied the front two bedrooms and living room in his residence. Dr. Jarrette took us on a tour, during which he proudly exhibited the filing cabinets containing all the student files of his “graduates,” including ourselves. He proudly boasted of his many graduates who were then employed by the federal, state, and local governments. Dr. Jarrette then offered us the opportunity to raise funds on behalf of Southeastern University and to keep one third of the revenues. After this visit, we returned to Charlotte to review our observations with the Assistant United States Attorney.

Since the Assistant United States Attorney desired to show the criminal nature of Dr. Jarrette’s entire operation, a third FBI

Otho Allen Ezell, Jr. is an Assistant Vice President and Senior Investigator with First Union Corporation in Tampa, Florida. Upon his retirement from the Federal Bureau of Investigation (FBI) in December, 1991, after a 31 year career, he joined the Special Investigations Unit (now Corporate Fraud Investigative Service). He is currently in the process of co-authoring a book on diploma mills with Dr. John B. Bear, author of Bear’s Guide to Earning Degrees by Distance Learning.
Agent was introduced. He negotiated a $5,000 fee for the purchase of a master’s degree in Theology from Southeastern University Theological Seminary. A date and time was agreed upon for the delivery of this degree.

On May 4, 1981, all three FBI Agents arrived at Southeastern University, not with $5,000, but with a federal search warrant. The building was searched and all student files, correspondence, blank degrees, transcripts, seals, etc. were taken. Dr. Jarrette was given a receipt for the seized items and the FBI team departed for Charlotte.

The following morning, South Carolina law enforcement officials called to inform us that after we had departed Greenville, Dr. Jarrette committed suicide.

We had not yet opened the boxes of records taken from Southeastern University. When we reviewed these documents, we determined that Southeastern University, in its eleven-year existence, had 620 “graduates” of which 171 were employed at the federal, state, and local government levels. Some of these “graduates” were even high-ranking officials in Washington, D.C. These names were later disseminated to the appropriate Inspector Generals of the respective agencies, and to various State Attorneys General. This was the beginning of DIPS CAM.

As a result of the large quantity of school records seized, DIPS CAM created a database with over 12,000 names of “graduates.” As each case was adjudicated, a listing of the “graduates,” along with home address, type and date of degree, amount paid, and place of employment was placed in the court record. This list became a “public record” and was available to universities and the media.

Of all the cases brought forward in United States District Court, only one case resulted in a jury trial. This trial lasted two and a half weeks and produced over 100 witnesses, including testimony from officials of AACRAO, COPA, and several registrars from legitimate universities. For the other cases, the operators of the diploma mills were prosecuted in United States District Court, and numerous “graduates” were prosecuted in state courts as a result of the “graduate” list becoming public record.

DIPS CAM and the resulting search warrants, arrests, convictions, related prosecutions, and publicity (along with Congressional hearings) resulted in a new awareness in the academic and business community of the magnitude of the problem. Various businesses and government agencies have established procedures whereby the educational credentials of current/new employees are now checked to determine their legitimacy.

Although DIPS CAM has ceased to operate since 1991, several FBI offices have instituted independent investigations of large-scale diploma mill operations. These are labor intensive investigations involving the review of large quantities of seized documents. It is truly a cooperative venture between the FBI, the United States Attorney’s Office, and the United States District Court. It takes a team effort to stop a diploma mill.

Additionally, several State Attorneys General have utilized “sting” operations in order to obtain the necessary evidence to clean up their own states of these entities. In particular, the Attorney General of Missouri established its own diploma mill (Eastern Missouri Business College) and even arranged for a storefront-type office for the one time its “accrediting” entity would inspect the facility. This resulted in the Attorney General obtaining a cease and desist order against the International Accrediting Commission for Schools, Colleges and Theological Seminaries, which “accredits” about 150 entities.

**Recidivism**

Generally, once the diploma mill operator had been the subject of an undercover operation, indicted by a Federal Grand Jury, arrested, and had his case adjudicated in court, he normally goes “out of the business.” However, there are a few who are believed to have continued to operate diploma mills from inside federal prison via outside mail drops, answering services, and sometimes, with assistance from confederates.

**History of Diploma Mills**

Diploma mills have existed since the inception of colleges and universities, with the earliest recorded to be Richmond College in Jefferson County, Ohio, which was chartered in 1835. Then with the advent of an efficient postal system, and the growth of the Internet, diploma mills have grown in scope. Historically, a locally owned and operated diploma mill (possibly a one-man operation) was able to victimize persons—both students and businessmen—throughout the world. Today, many such operators have seized upon the Internet as a means to truly reach a world-wide audience, especially with “virtual universities.” In light of this, I have been contacted by Congressional investigators regarding certain Internet-operated diploma mills to address this nationwide problem and to craft legislation which would put an end to these operations.

**Are Diploma Mills a Threat Today?**

Yes, and now more than ever before. Diploma mills are everywhere. With the advent of the Internet, this has become a global money making operation. There are even diploma mills using “spam mail” to locate prospective “students.”

They are such a threat today that the Better Business Bureau (www.bbb.com) has published a warning on its Web site: “Is the Internet Becoming a Haven for diploma mills?” The BBB then states, “As the concept of earning a degree without leaving home becomes more accepted, the most virtual of virtual universities—better known as digital diploma mills—are gaining enrollees. Many fraudulent diploma mills are capitalizing on the growth in popularity of distance learning opportunities and are using the freedom of the Internet to lure students into their ‘programs.’”

Diploma mills are a serious threat to our educational standards because:

They damage, due to misunderstandings in the public mind, the legitimate educational institutions;

Overall, they “devalue” an earned degree from a legitimate institution;
Often, they confuse the public, as some diploma mills are established in the same name as legitimate colleges and universities;

They defraud those who honestly believe they have received recognition from a legitimate institution of higher education;

They deceive employers, customers, clients, and patients who believe they are dealing with a professional who has received the formal training and education as evidenced by the degree; and

They lower prestige abroad by deceiving foreign students.

Educational institutions abroad are governed by national legislation; thus, foreign students believe that all educational institutions in the United States are similarly controlled. Instead, appropriate legislation and controls are left up to the individual states.

Several larger domestic diploma mills have "targeted" South American and Middle Eastern countries and even recruited local brokers in those areas in an effort to increase their number of "students" from those countries. These diploma mills have even had their school literature, bulletins, etc., printed in the local languages.

Scope of the Problem

The problem of diploma mills is not unique to the United States. Diploma mills as operated in the United States defraud individuals throughout the world. Previously, several of these U.S.-based diploma mills purported to be operating in various foreign countries. For example, Norman Bradley Fowler was convicted for operating Loyola University, Paris, France; Roosevelt University, Brussels, Belgium; DePaul University, Paris, France; University of England at Oxford, London, England; Cromwell University, London, England; and Lafayette University, Amsterdam, Netherlands. The addresses for these schools were nothing more that "convenience addresses," whereby incoming mail would be re-mailed weekly to another foreign address or re-mailed back to the United States.

On the other hand, diploma mills operated in other countries, particularly the United Kingdom, exist to sell diplomas to foreigners only, thus not violating statutes in their country. This is especially true today, as a host of institutions are being operated from "boiler rooms" (telemarketing rooms) in the United Kingdom and are using "spam mail" as their main medium for advertising. Their printing presses are in Jerusalem; wire transfers go to an account in Cyprus; credit card payments are processed in Romania; and degrees and transcripts are shipped in the United States from Baldwin Park, California, using a return address of a mail drop in Beverly Hills, California (where there have been nineteen diploma mills and fictional accreditation entities using this same mail drop).

FIGURE 1. EXAMPLE OF "SPAM MAIL"
rical of dealing with them, they are more than willing to fax you a sample copy of what your transcript will look like. [I have received identical sample transcripts from Brentwick University, Harrington University, University of Devonshire, and University of Ravenhurst, in the student name of Adam Smith, dated June 14, 1997, reflecting a 3.8 GPA.] With the faxed transcript, they also send an authorization form so you can charge your degree to your credit card. Or, they will give you detailed instructions on sending payment via Western Union “Fast Pay.” If you do not “bite” immediately on this great offer, they will continue to call you (and e-mail you), and lower the price of the degree to $800 (half now/half later). Only once did they directly ask me exactly how much money I had on hand. Additionally, you are given the Internet address for the entity from which they claim accreditation/recognition, the European Council for Distance Learning (ecdl).

During the sales pitch by the “registrars” for the above institutions, they each indicate they have been operating since 1983, and no degree has “backfired” on any student. Buyers are told that details regarding degree verification will accompany the degree. Only on one occasion did the “registrar” for Thornewood University indicate that after I became a graduate, I could then refer potential students to them for $200 for each degree sold.

The aforementioned operation uses computers to store all customers’ names, addresses, telephone numbers, date, type of degree being sold, and price. Thus, when an individual calls the telephone number indicated on the spam mail and records a name and telephone number for a return call, the operators of these diploma mills then check these telephone numbers against their database. Then, when they return the call, they have all of the above information in front of them and know what persons they have previously spoken to at this telephone number. [Be careful when using more than one name from the same telephone number.]

During these sales pitches, the registrars ask for the telephone number for your fax machine, then send you a letter confirming your telephone conversation, and enumerating exactly what you will get for your money. One of these confirmation letters is on the next page.

Previously, verification of degrees purchased was available by mail and telephone through the diploma mill, with the same ease throughout the world, irrespective of where the diploma mill was based. Today, those diploma mills that are Internet-based inform the “potential graduate” that upon graduation, he or she will be given the address for the university’s “secure Web site” where the “graduate’s” name will be listed. He or she can then give this Web address (and password) to anyone wishing to verify the degree.

Additional Threats
Compounding the problems of the traditional “diploma mill” are the enterprising individuals who operate “Replacement Degree Services” or “Novelty” companies from which one can purchase a degree purportedly issued by a legitimate college or university, all without having attended/graduated from the institution. During DIPSCAM, we had three such operations: Alumni Arts, Associated Enterprises/Regency Novelty Enterprises, and University Novelty Company. During an 18-month period, Alumni Arts sold 2,311 degrees in the names of legitimate, accredited colleges and universities, and grossed approximately $100,000. Alumni Arts offered degrees only (no transcripts) from over 320 colleges and universities, whereas Associated Enterprises offered degrees from “in stock” colleges and universities, along with degrees from any college of your choice. It was from this operation that we purchased a degree from the alma mater of our Chief Judge. Later, an operation called Unlimited Success Strategies Incorporated (USSI) dba Buy A College Degree (BACD), came to light after a counterfeit degree from the University of Notre Dame came to light. Notre Dame officials immediately took action and involved the United States Attorney’s Office and FBI. The individual responsible for this operation, Jay Cramblit, later pled guilty in federal court for violating the Copyright Statute (Title 18, Section 2320, U.S. Code). This was the first time I had observed this statute being used in the fight against diploma mills and replacement degree services. What made BACD unique, in addition to degrees and transcripts, was that they also offered rings, ties, blazer crests, miniature football helmets, etc.

Currently, we have available on the Internet numerous

![FIGURE 2. SAMPLE TRANSCRIPT](image-url)
companies offering CDs for sale containing templates for all forms of identification (birth certificates, state identification cards, drivers licenses, social security cards, alien registration cards, etc.) in addition to college degrees and transcripts. Further, they will even sell you a “transcript generator” which will calculate the GPA for your transcript. On one such Web site, webspawner.com, I indicated United States, then Florida, at which time it gave me a listing of the 25 institutions for which degree templates were available for sale. Some of the current Web sites openly identify themselves as “diploma mills” and quickly explain they are only printing shops, and thus only print degrees. Some go on to explain they will not produce a degree from an accredited institution, but it is up to the buyer to determine who is/is not accredited. Thus, the printer takes the buyer’s word and prints what is ordered. Other Web sites only offer degrees from “closed colleges” and offer a list of such institutions. Although some believe any entity with “.edu” in its Internet address must be real and legitimate, there are no qualifications whatsoever for “.edu” Web addresses.

In light of the events of September 11, 2001, and the various uses of false identification, etc., I expect new legislation will be forthcoming to outlaw some of the materials currently available for sale.

I invite you to review the following Web sites:

instantdegrees.com
universityamerica.edu
cooldegree.com
gradutatenow.com
fakediplomas.com
degree.freeserve.co.uk
diplomamakers.com
idtemplates.com
prestigious-images.com
degrees-r-us.com
blackmarket-press.com
universitydegree.com
unwf.com
wwsu.edu
concordia-college.net
capitoluniversity.com
geocities.com
afreescholarship.com (Americus University)

State Education Statutes

It is difficult to define exactly what a diploma mill (or degree mill) is, because as one author put it, “One man’s degree mill is another man’s alternative university.” The difficulty in defining a diploma mill/degree mill, without infringing upon distance education, alternative education, or non-traditional education also applies to the various states in their writing a law that makes a clear distinction between legitimate schools and mills.

Since higher education is not controlled by federal legislation per se, it is the responsibility of the individual states to regulate and control public and private secondary and postsecondary educational institutions. There are at least 50 different views and interpretations (ranging from conservative to liberal) as to exactly what is a diploma mill. Do we regulate it? If so, how?

I like the approach Oregon is taking. Oregon Revised Statute 348.609 states “any degree from an unaccredited institution is considered an invalid credential unless the Office of Degree Authorization—Oregon Student Assistance Commission has evaluated the institution. Additionally, Oregon prohibits the offering of diploma mill degrees in or from the state. Oregon makes it both a civil and criminal violation to use an unaccredited degree or credential. The Web site maintained by the Oregon Student Assistance Commission, Office of Degree Authorization (www.osac.state.or.us/oda) has a diploma mill section and even maintains a list titled, “Degrees from these institutions are illegal for use in Oregon.”

If every state prohibited the use of diploma mill degrees, it would assist in reducing the demand for such degrees. This is a straightforward approach that requires a minimum amount of regulation. This would make the diploma mill degree useless in the business world. The only way to stop these criminal operations is to reduce the demand and simultaneously attack each diploma mill when it begins operation.
State laws range from those states which have no laws governing private postsecondary educational institutions to those states which require registration, approval, and authorization. Even those states which have lax regulations are tightening up, but particular attention should be paid to those entities located in Colorado, Hawaii, Louisiana, New Mexico, and Wyoming.

“Registration” merely requires the entity “register” with the appropriate agency, board, commission, or department so that the board will have a record of those entities doing business in that particular state. This registration may include the name of the institution, its physical address, telephone number, incorporation details, identity of its officers, faculty, courses offered, number of students, etc.

“Approval” means that the entity has registered with the board and meets whatever state requirements, if any, and thus has been “approved” to operate in this particular state. These requirements may require a qualitative review and assessment of the institution through the use of an institutional self-study and a comprehensive on-site evaluation by a qualified visitation committee: (1) that the institution has the necessary resources and capabilities to afford students, and to require of students, the completion of a program of education preparing them for a degree; (2) that the curriculum is consistent in quality with curriculum offered by established accredited institutions; and (3) that the courses achieve their professed objectives, with verifiable evidence of the students’ achievement being comparable to that required of graduates from accredited institutions.

“Authorized” means that the entity has registered with the board and has gone through an application process, probably a comprehensive on-site review conducted by state authorities, and that the institution complies with formal standards relating to: institutional objectives; administrative methods; curriculum; instruction; faculty, including their qualifications; physical facilities; administrative personnel; procedures for keeping educational records; tuition, fee, and refund schedules; admissions standards; scholastic regulations and graduation requirements; degrees offered; and, financial stability.

For most private degree-granting institutions, the category of “authorized” is the only realistic and reasonable means of beginning operations. Many institutions later move to approval or accreditation of their degree programs. In several other states, provisions were made in legislation exempting colleges or universities operated by a church or religious denomination. (The purpose for such exemption is the separation of church and state.)

Therefore, as a base of operation, criminals seek those states (or countries) which:

Have no laws governing private colleges;
Only have registration provisions;
Have religious exemptions to the state statutes;
Are either liberal in their laws or just don’t have enforcement provisions built into existing legislation; and/or
Do not forbid the sale of degrees to residents of other countries.

There are several alternatives to the above. Namely, establish a diploma mill at a private mail facility in a foreign country and have all mail received (including student checks) forwarded to the United States. Thus, the purported institution is supposedly located in a foreign country; however, for all practical purposes, it exists within the United States and is thus subject to the appropriate state legislation. Or just establish the institution in a state with no (or little) law or regulation, and via a mail drop/answering service (with mail forwarding), operate this ghost school from any other state within the country.

An excellent example of this is Columbia State University. It advertised B.A., M.A., and Ph.D. degrees and listed a toll-free telephone number. Columbia State University literature indicated it was located at 3500 N. Causeway Blvd, Suite 160, Metairie, Louisiana, when in fact it was operated from a building in San Clemente, California. CSU literature even included a 150-page book titled, Accredited College Degrees by Correspondence, which listed the “Editor’s Picks — 5 Best School Choices” and the “3 Worst Schools.” Of course, Columbia State University was listed as the editor’s #1 school, followed by #2 Brigham Young University. Thus, Columbia State University sought legitimacy by placing themselves next to a nationally known, accredited institution.

**Operation of a Diploma Mill**

The amount of planning and preparation that goes into the operation of a diploma mill in large part depends on the criminal himself and the type of operation he is setting up. It will range from the one-man post office box “briefcase” school, to the business type office, to the “college” with an actual campus, library, classrooms with various employees, several instructors, etc. Some diploma mills are designed to be a “by mail” only operation; thus no physical facility is required.

Typical logistics include:

- Incorporation/registration
- Opening a checking account
- Creation of Web site
- Rental of office space
- Installation of telephone; printing of stationery
- Applying for “accreditation” by any non-recognized accrediting entity, payment of required fees, and receipt of “membership” or status documentation from this entity. A copy of this document is then included in all brochures
- “Rental” of accreditation from a fellow criminal in the absence of legitimate accreditation
- Developing the brochure, literature, forms, programs, and Internet “virtual tour”
- Advertising/spam mail
- Solicitation of students—using all media forms and the Internet

**Trappings of Legitimacy**

The diploma mill will do everything in its power to appear legitimate, from presenting an award (plaque or degree) to a local government official (and later publishing this photograph in its literature) to condemning “diploma mills” (its competition). Some entities even publish unauthorized advertisements by traditional accredited colleges and universities side by side with their own advertisements.
Some diploma mills offer scholarships, grants, tuition payment plans, hats, pennants, pens and pencils, school rings, and diplomas which on some occasions are produced by the same companies who manufacture the same items for legitimate colleges and universities. Some of these entities also offer a “free video” to registered students. Generally, this video contains no footage of their facilities, faculty, or students. This video is another means by which they convince the student of their legitimacy.

Almost all diploma mills either create their own “accreditation” association or utilize the service of an existing “accreditation” association to, in turn, “accredit” their diploma mill. Sometimes they claim in their advertising to be “fully accredited,” “nationally accredited,” or “accredited worldwide.” As an alternative, schools will go to great lengths to state that accreditation is not necessary, that they receive legitimacy by the success of their graduates, etc.

Some diploma mills even establish an “Alumni Association” for its graduates. This, along with a copy of a form letter from its “accrediting agency,” lends additional credibility and respectability to this entity. None of this is accidental—this is all designed to deceive.

Are Its “Students” Really “Victims”?
There are several classes of persons who fall “victim” to diploma mills, and these range from (1) the true victim; (2) the slightly suspicious person; and (3) the knowing “victim.”

Some of the individuals who respond to advertisements by diploma mills are truly “victims.” These persons genuinely believe in the concept of “credit for life experience” (non-traditional education), and are not at all suspect of the advertisements or the literature they receive. This person probably has a significant number of years of work experience which he or she believes will equate to a significant number of credit hours towards a legitimate degree. The “true victim” never realizes that the business only exists on paper (or in virtual reality), or at a convenience address or answering service, and that the diploma mill may even be operated by someone located thousands of miles away.

The “slightly suspicious victim” may have taken the time to contact the appropriate State Department of Education officials regarding the status of the diploma mill, may have contacted the accrediting entity from which the school claimed accreditation, and similarly may have even contacted the Better Business Bureau regarding complaints, etc. After such research, the school appears to “check out,” and this person unwittingly becomes victimized.

The last category is the “knowing victim.” This person probably realizes exactly what he or she is getting into, and may even have been solicited by officials of the diploma mill. This person probably realizes this is not a legitimate non-traditional educational institution, but that it is in essence a glorified one-man operation. On the other hand, this class of victim believes that his or her ultimate use of the degree and transcript will financially outweigh its “cost.”

Use of Diploma Mill Papers By Its “Graduates”—Third Party Fraud
The diploma mill “graduate” may or may not know the credentials he or she is presenting are from a diploma mill, but if the person to whom the credentials are presented relies on these credentials, then “Third Party Fraud” has occurred.

Third Party Fraud is when the student knows he is purchasing a degree and transcript from a diploma mill; the diploma mill operator knows what he is selling; however, the employer (or you and I, along with the public at large—the “third party”) does not know the worthlessness of these credentials. Thus, a triangle has been established, with the third party being the person/entity to which these worthless credentials are presented as genuine, earned academic credentials.

“Third Party Fraud,” or the defrauding of others (normally employers, business associates, customers/clients, licensing boards, etc.) occurs when diploma mill diplomas and transcripts are presented as (or listed as) legitimate educational credentials. Sometimes the person using these worthless credentials will even indicate the specific period (1990-1994) during which he/she “attended” this purported college or university.

In the broadest sense, these worthless credentials may not be used directly, but indirectly. These credentials may just be hung on a wall in the office of a professional or business person to be viewed by those within these premises and those customers/clients who routinely come into this office.

Detection of Diploma Mill Paper by Educational Institutions and the Business Community
The Congressional Subcommittee holding public hearings in 1984 and 1985 (AACRAO President Bruce Shutt of the University of Georgia testified) documented the widespread use of fictitious educational credentials throughout the United States. The Subcommittee estimated that about 300,000 Americans have secured, or are employed today based on credentials they purchased, but did not earn. This included 10,000 doctors, or one in every 50 physicians, practicing with falsified or questionable credentials. This does not include about 30 million Americans, or one in three employed Americans, who may have been hired on the basis of a resumé that has been altered or embellished.

The Subcommittee’s findings are as true today as they were then. They found that fraudulent credentials are:

- Easy and cheap to obtain;
- Increasing in numbers;
- Not confined to a particular occupation or national region;
- Stimulated by current educational employment trends (increased competition for fewer jobs, thus credentials are critical); and
- Not easy to detect or deter due to current regulatory, enforcement and licensing exams.

Normally, the prime areas of falsification are:

- To show academic degrees that have not been earned;
- To report as completed, a major or area of concentration for which some requirements were not satisfied;
- To falsify reference to age;
- To qualify for financial aid by altering dates of attendance;
To show coursework not taken;
To alter grades in hope of enhancing employability; and
To present someone else’s academic record as one’s own by changing the record’s identity.

With this widespread use of fictitious educational credentials, it is incumbent upon the recipient/user of these educational credentials to verify the legitimacy of these records, to determine if they are in fact from legitimate accredited entities, and then to verify they are true, accurate, and official.

**Badges of Fraud/Red Flags of a Diploma Mill**

A basic checklist for users of academic records and transcripts is as follows:

- Was the document mailed directly from the registrar at the issuing institution?
- Was the envelope postmarked in the city where the institution is located?
- Did the envelope have an institutional postage meter mark rather than a stamp? Are the city and state of the postmark correct?
- Does the document have a recent date of issue?
- Is there a registrar signature and university seal? Are they clear and authentic?
- Is the lettering on the envelope, letterhead stationery, and transcript clear?
- Is the color of ink correct and consistent?
- Do the documents themselves appear to be professional or homemade?
- Do any “broken lines” appear? This may indicate a cut/paste/copy job.
- Is the seal crisp, clear, and legible? Is the seal identical to others you have observed from this same institution?
- Overall, does the age of the graduate correspond with GPA and courses listed? Is it too good to be true?
- Is the postmark on the college or university literature/catalog identical with the return address on this same literature?
- The above “buzz words” probably mean nothing at all, especially if the school is operated from or purports to be located in a state that has no laws.
- Do they offer short-cut programs and courses leading to “credentials” disproportionately high in status?
- Does the catalog or literature from this college or university contain a picture of the “degree” or “transcript” as issued by this “school”?
- Does this college or university offer “backdated” degrees?
- Is this college or university “accredited,” if so, by whom?
- Is the accreditation by one of the recognized national or regional accrediting associations?
- What is the relationship between the non-recognized accrediting agency and the college or university? Are they operated by the same or related persons? How long has this non-recognized accrediting agency been in existence? Where is it located? Does it have a real office with live staff? Or, are the phones always answered with a recording, thereafter listing those schools which it accredits?

- Does this school offer “commissions” (finder’s fees) for new students? Does it use “brokers” to recruit new students?
- Is this college or university incorporated, if so, as a nonprofit or profit-making organization?
- How long has the college or university been in existence?
- Does the college or university have a physical facility?
- Is this facility located at the same address to which you correspond?
- What is this facility? Is this just an office or is it a campus or learning facility?
- Does the college or university list its faculty in its literature or catalog? Are these individuals actually members of the faculty of this college or university?
- Do the faculty members possess traditional or nontraditional degrees? Are these degrees from the same (or a related) institution?
- One person’s name appears repeatedly as performing a wide variety of functions.
- Do the transcripts from this college contain courses and grades which courses the student never took, has no knowledge of, or limited knowledge in those fields?
- Have degrees, as issued by this college or university, previously been accepted by legitimate accredited colleges and universities? If so, request a listing.
- Does the literature from this college or university contain the following “buzz words?”:
  - pursuing accreditation
  - licensed
  - authorized
  - (State) authorized
  - recognized
  - chartered

**Federal and State Statutes**

The following are the various federal statutes that have been successfully used in the prosecution of operators and employees of diploma mills:

**UNITED STATES CODE**

**Title 18, Section 2 - (Aid and Abet)**

To assist, counsel, command, induce, or procure an offense against the United States.

**Section 371 - (Conspiracy)**

Two or more persons conspire to commit any offense against the United States, and one or more of such persons does any act to effect the object of the conspiracy to put the plan into action.

**Section 1028 - (False Identification)**

Knowingly and without lawful authority produces/transfers/possesses with intent to use, an identification document or a false identification document.

**Section 1341 - (Mail Fraud)**

The use of the United States mail system in any scheme or artifice to defraud (the mail matter does not have to travel interstate).
Section 1343 - (Fraud By Wire)
Any wire (telephone/computer), radio, or television communica-

tion in interstate or foreign commerce for the purpose of execut-
ing any scheme or artifice to defraud.

Section 1956 - Laundering of Monetary Instruments (Money
Laundering)
A financial transaction involving the proceeds from an unlawful
activity; to conceal, disguise the nature or source of ownership of
these proceeds.

Section 1957 - Money Laundering
Engaging in monetary transactions in property derived from
specified unlawful activity; engaging in a monetary transaction in
criminally derived property greater than $10,000.

Section 2320 - Trade Mark Violation
Traffics in goods or services and knowingly uses a counterfeit
mark.

Section 982 - Criminal Forfeiture
Used in conjunction with Sections 1956 and 1957, whereby the
court can order the person to forfeit to the United States any real
property involved in or traceable to the offense.

Title 26, Section 7201 - Tax Evasion
Any attempt to evade or defeat tax.

STATE STATUTES
These are not listed here because they vary in each state. These
statutes range from governing the formation/incorporation/opera-
tion of any entity bearing the name “college” or “university,” to
the qualifications for any entity that grants academic credit and
awards degrees. Additionally, various states have statutes forbid-
ding the obtaining of academic credit by fraudulent means, for-
gery of transcripts and diplomas and the use of these
altered/forged documents, and the counterfeiting of any degree
purportedly issued by a state institution. Other state statutes nor-

mally exist in the area of false pretense and deception.

Deterrents to Diploma Mills
I believe this approach should be taken—eliminate the source and
devalue the product.

Stop the diploma mill when it first opens. If it sells degrees and
transcripts of your college or university (or templates containing
your blank degrees), then consult your university counsel and the
Attorney General's Office for prosecution, or as an alternative,
issue a cease and desist order.

Ensure that law enforcement understands your desire to obtain
a listing of any and all persons who purchase degrees in the name
of your institution should they execute a search warrant on this
type of operation. A successful way of making this information
available is for law enforcement to enter a list of all purchasers
along with their addresses and type of degrees purchased into the
court record, thus making this list a “public record” and available
both to the university and to the press. Publicity and the resulting
humiliation for the purchasers serve as a strong public deterrent.

With diligence on the part of ordinary citizens, higher educa-
tion professionals, and law enforcement officials, the problem of
the diploma mill can be addressed, and hopefully eradicated in the
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mtressel@xap.com
While working at a Division III institution best known for academics and music, where at most 10 percent of incoming students are recruited athletes, I could have been tempted to consider the admissions-athletics nexus irrelevant. For much of my student and working life, I have only had peripheral involvement in athletics.

In my first several admissions-related positions (Bennington, Vassar, “Duke”), I had at most passing acquaintances with coaches. Not until I became athletic liaison to men’s and women’s soccer, sailing, and skiing at Boston College did I begin to understand how athletics and admissions could be partners or adversaries. Later as a college counselor at Phillips Academy, I coached junior varsity baseball and advised numerous students who were being recruited to Division I, Ivy League, and extremely selective Division III institutions. Prep school counseling showed me that athletics could be crucial to certain admissions cases. When I arrived at Oberlin College and the new athletic director suggested I become the chief athletic liaison, my first inclination was to say, “Not a chance, who wants the headache?” I saw chief athletic liaison as a role bound to generate controversy. If athletics is happy with your work, admissions may think you are giving away the store. If the admissions office hails you for guarding standards jealously, athletics may be railing against you. Still, liking challenges, I accepted and found it excellent preparation for my eventual role as director of admissions.

Through my experience in admissions and counseling, I have gathered some potentially instructive anecdotes related to athletics. I’ve seen an NCAA Division I basketball coach, accustomed to prowling the court perimeter like a general, waiting anxiously in the admissions office lobby, ready to petition the director for a needed recruit. I’ve seen veteran Division III coaches tell new colleagues, “Don’t trust admissions; they don’t care about sports.” I’ve seen Division I crew coaches guarantee prospective students admission if they declare the university their first choice and cease to talk to other crew coaches. In one such case, a student asked me, as his counselor, if he should believe the coach. I called the admissions director at the university and was told, “coaches can’t promise admission.” I’ve seen a Division III admissions officer not tell a prospective student that the college had just added a golf team. The prospective student decided to cross the college off her list.

Three questions often arise when discussing how to bring athletic departments and admissions offices together in a cooperative arrangement. Are we all on the same team, promoting the goals of our institution? Or are we adversaries jostling for power, retreating to our respective bunkers, trying to win a war of attrition: athletics versus admissions? And, if we are committed to working together, how can we work together to bring the brightest and most athletically talented students to our campuses?

Let’s start with the stereotypes about admissions and athletics. The stereotypes are ever present. After all, aren’t admissions directors and athletic directors supposed to be natural adversaries? In other words, is it the objective of athletics to try to get away with things and the objective of admissions to try to stop them? Don’t athletic directors care more about a student’s shooting percentage than grade point averages or test scores? Aren’t admissions directors gatekeepers who care only about grades and test scores? Don’t admissions directors usually see coaches as trying to lower academic standards, arguing for preferences for “jocks,” attempting to invoke a kind of affirmative action? Witness the profusion of admissions versus athletics panels offered at admissions conferences.

And how do athletic directors and coaches see admissions officers? Is it common for coaches and athletic directors to question whether an admissions staff truly believes in the concept of scholar-athletes or merely pays lip service while clinging to dumb jock stereotypes? Do scholar-athletes become, as coaches and
The Game of Life, Scholastic-Athlete-Parents, etc. at proportionally higher rates than non-athletes? Shulman and Bowen’s (2000) provocative book, The Game of Life, suggests that scholar-athletes are more likely to enroll in pre-law and pre-business type majors than the general college population. Is the populating of social science majors by athletes a good phenomenon or the result of choosing “recommended” majors? Do these questions get at an unbridgeable gulf between admissions and athletics?

Admissions and athletics departments need to work together to achieve institutional goals. To the extent that athletics provide balance and diversity to a campus, cooperative recruitment efforts and civil communications are beneficial to colleges and universities. All admissions officers should know certain basic information: the sports offered by their institution; the names and faces of the coaches; the differences between scholarship Division I, non-scholarship Division I, Division II, and Division III athletics; and the steps prospective athletes must take to register with the NCAA clearinghouse. You would be surprised how many admissions officers fail these basics.

Can admissions offices afford an adversarial relationship with athletic director or coaches? No, for numerous and obvious reasons. Coaches, I have found, are as good at recruiting as many admissions officers. The smaller number of prospective students managed by a coach enables greater personalization of contact. At Oberlin, for example, we interviewed a football coach whose squad comprised one-fifth of his college’s student body. Who could argue accurately that that coach wasn’t as important to enrollment as any admissions officer? Athletic personnel also interact frequently with influential alumni, prospective donors, and other important offices, such as alumni affairs and development. Coaches and athletic directors may experience a larger reach into the institutional family than even the admissions director. Often their contacts aid and abet institutional promotion. Positive feeling among the institutional family, obviously, always helps the admissions effort. Part of an admissions director’s cheerleading function is to create and sustain good feelings about the institution in all corners encountered.

Studies (Arts and Sciences Group 2001) show that a constellation of individuals and factors influence a student’s college choice. Admission and recruitment efforts frequently focus on guidance counselors, a group demonstrated by research to have much influence on the student’s college list compilation, but little influence over the student’s final choice. I can attest to the finding from my few years of experience in college guidance. Studies, nevertheless, consistently fail to measure how much or little the recruitment efforts of college coaches determine college choice. I would speculate that in the case of future scholar-athletes, the influence of coaches is quite significant.

What can be done to improve the working relationship between admissions and athletics? Let’s start with basic often-overlooked, points. Keep the lines of communication open. Stay honest and candid. Trust each other. Establish some formal structures, such as sports liaisons, linking individual admissions officers and coaches. Institute a clearly defined application review process for recruited scholar-athletes. Consider implementing a subcommittee to handle appeals. Hire admissions officers who aren’t biased against sports. Be seen at games, around the field house, etc. Be attentive to athletic recruitment goals and team needs. Insist that coaches respect the confidentiality and protocol of the admission process. Make sure coaches promise recruits no more than they can deliver.

The needs of Division III are vastly different from Division I. Division III athletes, in all cases, are first and foremost students. There is no clouding where the commitment lies. Some admissions officers regard a Division III athlete as having mediocre athletic skills in the grand scheme of things, but skills that nevertheless (and some argue unfairly) open doors. (Shulman and Bowen 2000; Von Hoffman 2002). Staff are welcomed to a diverse array of opinions as long as they don’t revert to knee-jerk stereotypes and ignore institutional edicts to help build excellence in athletics.

There are numerous ways to manage the admissions to athletics nexus.

1. Appoint individual sports liaisons managed by a chief athletics liaison. This is perhaps the most common system in practice.
2. Create a joint admissions/athletics position. That position serves as the chief athletics liaison, coordinating information flow between the two departments.
3. Allot a limited number of free passes for coaches to use with admissions over a two-year period. Free passes enable coaches to request that “wait list” or “deny” decisions be changed to “admit.” Admissions keeps count of the free passes.
4. Establish an athletic appeals committee, staffed by the athletics and admissions directors and a few admissions officers. Have the committee make determinations regarding the most difficult cases.

Maybe most admissions deans and athletic directors will never be close. But at the very least they should aspire to have a respectful working relationship that promotes the goals of their institution. The process of working together may also enable both sides to develop new skills.

References
Arts and Sciences Group. 2001. Students report high satisfaction with the quality of college counseling in high schools. 4(2).


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Digital Developments in Higher Education: Theory and Practice

By Peter Roberts and Mark Chambers, Editors
Taylor Graham Publishing 2001; $55.00; 190 pp.

Digital Developments in Higher Education: Theory and Practice is aptly titled. The slender volume comprises selected essays on the penetration and influence of technology and electronic communication in the academy today. Registrars and business officers have long wrestled with the adaptation of computers and sophisticated software as applied to the core functions of their offices. The entry of software as an aid to learning and its role in making distance education a reality are relatively recent phenomena that are now making their influence felt in the future of higher education. One of the useful features of this book is an introductory chapter by the editors which encapsulates the content of each of the essays so that a busy reader can be selective in choosing what might be most relevant to a particular need.

In some respects the reader is treated to two volumes in one. The first half is devoted to a wide-ranging discussion of the theories underpinning the development and promotion of technology in instruction, academic programs, and degrees. It is suggested that the introduction of technology is much more than simply an alternative means of delivering instruction. It can be used to drive the repackaging of materials to make them more palatable or more “saleable” to the consuming public. The authors use the term “commodification” to describe this, a word that apparently is in ordinary usage among scholars in the countries of the British Commonwealth. There is also the concern that the very use of technology can assist in shifting the locus of instruction into the corporate sphere and away from the traditional centers of learning. The terms “vocationalisation” and “marketisation” of education are employed to characterize this potential trend. And finally, one author expresses the concern that technology as employed in the virtual classroom supports the case that the educational structure should be utilized primarily to foster economic development, perhaps at the expense of a more familiar role that higher education has played in society. These propositions are set forth in a fashion to cause the thoughtful reader to pause and balance the blessings and shortcomings of technology and to examine carefully some of the extravagant claims made for it in the realm of education today.

The second half of the book deals with the application of technology, including the Internet, in the delivery and extension of what we consider to be the products of the educational enterprise. In this section, for the most part, the influence of technology is viewed as a positive force. For example, the case for electronic publishing as a practical alternative to the rising costs of printed journals is examined with approval. There is a revealing chapter on how an instructor of English at SUNY at Binghamton worked to integrate technology into her classroom in an effort to improve literacy among her students. Her description of using word processing techniques of a decade ago, and introducing more advanced applications as they became available to her students, is instructive of the practical value of technology in the classroom. Another chapter describes the electronic links that this same instructor helped to develop between her institution and a class taught at the University of Auckland in New Zealand. The students involved on both sides of the world needed to understand cultural differences and the subtleties of electronic conversation in order to communicate effectively. Without the Internet, this digital collaboration would not have been possible. Other chapters illustrate the advantages of online learning and the opportunities presented for course enrichment. In addition, there is an incisive chapter on the development of Technology-Assisted Lifelong Learning (TALL) at Oxford University in the United Kingdom, the oldest English speaking university in the world and an institution steeped in tradition.

A note on style may be in order. Most but not all of the contributing authors are from British Commonwealth countries, and many of them appear to favor using the “tion” words in lengthy and complex sentences. This is particularly true of the chapters devoted to what this reviewer terms theory. Consequently, some of the concepts encountered are more difficult to fully comprehend than they should be in ordinary discourse. By contrast, the chapters on practice or applications appear to be more clearly written and their messages more readily understood. Perhaps this is simply a reflection of the experience of this reviewer in dealing with processes and procedures over a span of many years. But the theories that undergird the practice are important to understand because they will likely endure into the future whereas current applications as we know them are probably destined to become historic curiosities as technology continues to advance.

This book is worth a good read by anyone involved in developing or administering academic programs in higher education. A registrar or admissions officer will stand to gain a better appreciation of not only what is involved in building online offerings, but also in an increased understanding of the factors that can contribute to a successful experience. It appears that the use of the virtual classroom is more readily accepted as a component of higher education in the United Kingdom and Commonwealth countries than is generally the case in the United States at the present time. The chapters are written so that they can be read as stand alone articles if desired.

Thomas L. W. Johnson is Executive Associate Registrar at the University of Wisconsin-Madison.
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