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IN A CLOSED DOOR MEETING ABOUT SELECTIVE ADMISSIONS INSTITUTIONS SEVERAL YEARS AGO, ONE ADMISSIONS PROFESSIONAL WAS CANDID ENOUGH TO SHARE ALL OF THE DATA HIS UNIVERSITY USED IN MAKING DECISIONS ABOUT WHOM TO ADMIT AND DENY. AT ONE POINT DURING THE DISCUSSION, HE DESCRIBED STUDENTS WITH SAT SCORES IN EXCESS OF 1200 BUT NOT ABOVE 1300 AS AT RISK STUDENTS. IMMEDIATELY ONE OF MY COLLEAGUES AT THE MEETING ASKED THE FOLLOWING QUESTION: “BUT YOU DO ADMIT SOME OF THEM, WHEN YOU DO, HOW DO THEY FARE? ARE THEY MORE LIKELY TO DROP OUT OR EARN DRAMATICALLY LOWER GRADES?” THE RESPONSE WAS, “NO THEY PERFORM ABOUT THE SAME AS STUDENTS WITH SAT SCORES OF 1300 OR BETTER.” TO THIS MY COLLEAGUE RESPONDED, “SO THE ONLY THING THAT IS AT RISK IS THE LIKELIHOOD OF BEING ADMITTED.”
Except, perhaps, for student financial aid, no other area within the organizational and strategic domain of enrollment management has garnered as much criticism and public scrutiny as the admissions processes that are employed by colleges and universities. The admissions process has been under the microscope for a number of reasons:

- affirmative action;
- the role of the ACT and SAT tests;
- the call of higher high school graduation standards;
- the pressures associated with selective admissions institutions and the attendant focus on academic merit;
- early decision and early action admissions programs;
- and the impact that institutional admissions selectivity have upon rankings.

Critics of the prevailing admissions process come from many angles, armed with an arsenal of alternative approaches that would remedy the ills of traditional models. For example, they may point to the benefits of A level exams in the United Kingdom or the Abitur exam in Germany—tests that focus on specific subject areas that students emphasized in their high school studies—as the potential answer to the problems with admissions testing and the admissions process in the United States. Other educational observers have argued that high stakes high school exit exams could be used to make college admissions decisions instead of standardized tests. Recently the National Association of College Admissions Counselors issued a critical report of both the use of standardized admissions tests as well as early decision (ED) and early action (EA) admissions schemes. Finally, some observers of higher education have questioned the open admissions policies of many community colleges and raised questions as to whether having minimal admissions standards are a good use of public resources when so many students enrolled in community colleges never graduate or transfer. Increasingly policy makers and observers of American higher education have called for a shift from a focus on student access to student success. They have advanced the argument that student access alone, without also providing a reasonable chance at graduating after being admitted, is ultimately a hollow vision of postsecondary opportunity.
Against the backdrop of all of these criticisms, it is easy to see why some educational observers would be attracted to simple solutions, and the list of simple solutions is large.

In the midst of all of these criticisms sit senior enrollment managers who are charged with what has been called the grand sorting process that determines which students are admitted and exerts a large influence upon where students ultimately matriculate. At an increasing number of colleges and universities it is the responsibility of the senior enrollment officer to make the policy and strategic decisions that balance the often competing goals of the financial needs, the academic purposes and the basic mission of the institution. Senior enrollment managers are asked to broker campus aspirations for institutional prestige through measures of academic quality of entering classes, pressures for socioeconomic and racial diversity in those classes, and broader societal expectations and needs surrounding access and opportunity in postsecondary education. They are asked to achieve a sense of equilibrium among the pressures from admissions purists, institutional pragmatism, and social activism.

Most of these critics fail to recognize the complexities of college admissions in the large, highly decentralized postsecondary education system in the United States. They fail to take into consideration how different the landscape is in college admissions compared to many other countries and how diverse it is in the United States. One of our premises through this series of essays is that too much attention is focused on the practices and approaches of a relatively small number of highly selective institutions and that this attention drives too much of the criticism of things like standardized tests and alternative approaches to making admissions decisions. In fact, the average percentage of students admitted to public and private four-year institutions in the United States since the start of this new decade has vacillated between 73 percent and 69 percent. If we add community colleges to this mix the percentage of students who are admitted to college increases even more. Moreover, the fact is that most students get admitted to one of the institutions of their choice and a significant percentage attends the college that was their first choice. Though only a relatively small number of students compete for admission to a select set of hyper-selective institutions, much of the media and many of our professional meetings focus on the problems of these institutions and the students that apply to them. Many of the criticisms of admissions processes and even admissions tests are rooted in societal concerns about this small number of institutions and students in their applicant pools. Throughout this essay, this is an important context to keep in mind.

To examine and critique our complex admissions system we should first consider frameworks that can be used to define the system. Rigol (2002) provides a comprehensive and helpful overview of the various models of college admissions processes that are employed in the United States. She identifies four different models of college admissions and the underlying goals and purposes of each of these models.

- Eligibility Based Models which emphasize that open access to postsecondary education is an entitlement.
- Performance Based Models which operate with the assumption that admission to college is based upon a meritocracy and that admission is a reward for high performance as well as upon personal characteristics such as perseverance, serving others, and hard work.
- Student Capacity Model emphasizes that the role of higher education institutions is to seek out, identify talent, and to nurture it as well as to provide opportunities for upward mobility.
- Student Capacity to Contribute Model. This model takes a more instrumental view of postsecondary education. It recognizes that the role of higher education is to provide educated workers for the labor market. It also views postsecondary institutions as a business and that students can possess characteristics that help fulfill the mission of the institution, including providing needed revenue to help operate the college.

Rigol does not suggest that the admissions processes at all institutions operate on just one of these models, but rather that more than one of these can be in use at a single institution. In addition some of these models can be orthogonal to each other if not in actual tension, yet still be evident in the admissions process at a single college or university. For example many community colleges might emphasize both the Eligibility Model and the Student Capacity Model. Elite institutions rely primarily upon a Performance Based Model, but also at times use the Student Capacity Model, while many less selective public and private colleges base their admissions decisions on both the Student Capacity and the Student Capacity to Contribute Models.
Underlying all of these various models is a set of broader principles that merit examination. First, the college admissions process should be transparent. Students, parents, teachers, guidance personnel, and policy makers should be able to readily understand how decisions are made and the criteria used in making admissions decisions. Without transparency, many students fail to apply to institutions from which they can benefit and for which they might be a good fit because they may be uncertain of whether or not they have a reasonable chance of being admitted. In addition to transparency, college admissions processes should be fair. Students of equal ability and ambition should have an equal chance of being admitted, regardless of their educational and economic background, their ethnicity, and regardless of where they live in the United States. In addition, the system should be efficient for students, families, and institutions. The primary goal of attending a college or university is to receive an education, not to simply be admitted. Thus, the costs of applying and being admitted should not be too high for students and families, nor should institutions have to spend substantial amounts of money to decide whom to admit. In an era of scarce resources, institutions should seek to minimize their investments in the admissions process. Finally, given the large sums of public resources in the form of state subsidies to public institutions, as well as federal and state student financial aid, the admissions processes that institutions use should also include a level accountability to the public. That is, do the admissions processes that colleges and universities employ meet broader societal goals for postsecondary education? Do the admissions processes effectively and efficiently ensure access, identify talent, and help produce an educated citizenry that will also be productively employed?

From the outset, we assert that without greater transparency effective accountability is impossible. If we cannot systematically examine the processes across different types of institutions we cannot determine all of the outcomes of the process and can neither fully diagnosis the current reality nor prescribe viable new directions. Using these four criteria, a close examination of the college admissions
process in the United States reveals many problems with the current processes and models being used; these criteria also reveal likely problems with many of the possible solutions being advanced.

The array of admissions models and the underlying, and sometimes conflicting goals we have for college admissions create the dynamics and the tensions that define the contemporary context for enrollment management. The senior enrollment officer must ask, for example, how does an institution try to assure transparency, equality of access, develop talent, and reward hard work? How do institutions employ affirmative action policies to redress past injustices and student capacity, while also emphasizing transparency and reward past performance? Can open-admission colleges effectively employ an Eligibility Model to assure access to all while also increasing student persistence and the ability of all students to contribute? These are the kinds of questions that the thoughtful enrollment management officer brings to the arena of admissions policy and planning.

In this essay for *College and University* we focus primarily on the policy issues associated with the admissions process at four-year non-profit institutions. Issues such as admissions testing, affirmative action, and the admission practices of elite institutions are particularly pressing for four-year colleges and universities. The important concerns for community colleges and for-profit institutions are beyond the scope of this one essay.

**TWO PROBLEMATIC DIMENSIONS OF THE CURRENT SYSTEM**

**Early Decision and Early Action**

Looking across the varied admissions models employed by postsecondary institutions, perhaps the greatest criticism that can be leveled against our current admissions system is the lack of transparency to students and families. Since community colleges and some regional public institutions practice variants of open admissions these processes are relatively transparent. However, as selectivity rises the process becomes increasingly less transparent. Because the most selective institutions are usually the best funded, we find ourselves in a situation where the institutions with the greatest resources provide the least transparency.

Most students and families know that higher GPA and/or higher test scores increase the likelihood of being admitted, but many middle class and low-income students will have relatively little sense of how such factors as an essay, a personal interview, personal characteristics, athletics or other forms of talent, and even where a student lives might influence their odds of being admitted at highly selective institutions. In addition, practices such as Early Decision (ED) and Early Admissions (EA) are particularly troublesome, since they are especially opaque to many students and their families. Research has consistently shown that students who apply through these admissions programs are more likely to be admitted to selective institutions and that most of the students who apply in ED or EA programs are from affluent predominantly white households. Few low-income and/or students of color know enough about how these programs work to try to take advantage of them.

Lest we be too harsh on the lack of transparency in the admissions process among selective admissions institutions we must acknowledge the conundrum these institutions face. Some selective colleges and universities may have more than ten equally qualified applicants for every seat in the entering class. Other than simply having lottery system or relying solely on student GPA and/or standardized test scores to make admissions decisions, making the admissions process more transparent at selective institutions is a daunting task. Nevertheless, ED and EA programs clearly work in the opposite direction, complicated further by the fact that there are apparently endless variants of these programs. In a recent meeting of college presidents, one president noted that his elite college had as many as five different dates for which a student could apply for Early Decision. Another president described three different dates. Given these variations, even if a student was able to learn all of the nuances of ED or EA programs at one institution, it is unlikely that without private college counseling that the student would be able to negotiate the labyrinth of different programs and policies in order to make an informed decision, creating particularly insurmountable barriers for students from low income, first generation families. These kinds of admissions programs not only defy any sense of transparency but also fairness and equality of access. ED and EA programs may to some extent reward the hard work of many students who otherwise might not be admitted to more elite institutions but they could also be accused of rewarding students and families who have learned how to *work the system.*
In this context it is worth noting that the established deadline of May 1st for asking students to make decisions about where to attend was initially promulgated by more selective institutions, working with The College Board, in order to enable students to make an informed and educated decision that would enable him/her to choose a college or university that would provide the best fit. It is ironic that the group of institutions that played the major role in pushing for the May 1st deadline simultaneously engage in developing practices and processes that significantly undermine this outcome.

However, in terms of transparency, the problems with the May 1st deadline go beyond EA and ED programs. Among more selective and residential schools, practices associated with requiring or accepting an application for student housing or an application for a summer orientation/course registration program often means that students who apply early get preferential treatment when it comes to room assignments in residence halls or are able to register for courses earlier. This advantages these students in many subtle ways and again the least advantaged students—such as first generation students—are further disadvantaged by the fact that they are more likely to do everything later in the college admissions process. There is a high correlation between student socioeconomic status and acting early in applying for admissions, applying for housing, and registering for orientation. These practices also undermine concepts of fairness and of transparency as many low and moderate income students are unlikely to understand these more subtle rules of this game and may lack the resources to make deposits for housing, orientation, etc. earlier in the enrollment cycle.

The processes that colleges and universities have developed over decades to manage the admission of students understandably and appropriately invite criticism; nevertheless they are characterized by problems that defy simple solution. The senior enrollment management officer has the obligation to ensure that admission processes and policies adhere to principles of transparency, fairness, efficiency and accountability. In many ways, as institutional approaches are explored and examined, the prevalence of certain practices and policies at more selective institutions—like EA and ED—fail to offer effective guidance insofar as they fall short of these principles.

The Use of Admissions Tests

More challenging than EA and ED admissions programs, however, is the current critique of standardized admissions tests. A recent white paper on college admissions testing entitled “Report of the Commission on the Use of Standardized Tests in Undergraduate Admission”¹ (NACAC 2008) heavily criticizes standardized tests and appears to give additional momentum to the SAT/ACT Optional admissions processes being adopted at many colleges and universities. This movement and the general criticism of standardized tests fuel the firestorm that confronts the college admissions process.

Test scores do help to provide an efficient mechanism for sorting through applicants for admission; this was one of the reasons standardized admissions tests were first developed. But the criticism of standardized admissions exams is nothing new. There has long been an abundance of empirical evidence and some unsubstantiated assertions supporting positions that the tests reflect socioeconomic and cultural biases, that their correlation with college success is unremarkable, that they advantage students with certain learning styles that do not necessarily relate to success in certain fields of study or of practice, and that they are instruments whose use exacerbates societal barriers of educational access and opportunity for already disadvantaged populations. It is no surprise that a growing number of institutions are opting to make such exams optional in their admissions requirements and review.

We do find it remarkable that the SAT/ACT Optional movement has gained so much traction with so little empirical evidence of its impact. It is often offered as the solution to enabling colleges and universities to become more diverse, but like so many areas of admissions, we have strong assertions amidst weak empirical evidence. In a recent graduate seminar one of us (Don Hossler) had a group of students simply go into published sources of college admissions information including IPEDS and the annual US News and World Reports America’s Best College. Using extant data, they examined the percentage of students of color in the entering classes of colleges over time of institutions that had been practicing SAT/ACT Optional for more than five years. Interestingly, this group of graduate students found only one institution that re-


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ported a very modest increase in minority student enrollment over time. All of the other schools reported no increase. What did increase for all of these institutions, however, was the average SAT/ACT score. Should we be surprised? Probably not. It is axiomatic that students of all colors, including majority students, with lower scores will be less likely to send them if given the option not to and students with good scores will be more likely to send them. Is SAT/ACT Optional the solution to diversifying our campuses or is it a cynical ploy to increase apparent quality and selectivity?

William Sedlacek at the University of Maryland has conducted extensive research over decades on non-cognitive admissions criteria (add some cites). He has found that student characteristics such as self-esteem, the ability to delay gratification, and the ability to plan ahead can be superior predictors of student success in college, especially among students of color in predominantly white institutions. This line of inquiry provides useful insights into potential indicators of student success that could be used in admissions decisions in ways that counterbalance the effects of standardized admissions exams. In this post-affirmative action legal environment in which college admissions and enrollment officers must find new ways to pursue their diversity and access goals, it is not surprising that Sedlacek’s work from 30 years ago is finding fertile ground, being integrated into the review process at Oregon State University, DePaul University, and the Gates Millennial Scholarships.

Of course, one of the primary problems with these assessments, however, is that students can be easily coached on how to answer questions on surveys that might be measures of these non-cognitive indicators. Student portfolios may also be alternatives to the use of non-cognitive assessments or standardized tests. The primary limitation of student portfolios is that they are time consuming to review in order to make standardized admissions decisions for all applicants. This, in turn, means the admissions apparatus becomes more costly, which works against the goal of efficiency in admissions decisions.

The troubles associated with most alternatives to standardized tests bring us back to a closer examination of them. We submit that doing away with standardized tests may actually make the admissions system less transparent and fair and could negatively affect equality of access. Why less transparent? College admissions professionals know that all high schools are not created equally with respect to the rigor of their academic programs and the likelihood that students will succeed once admitted. If all institutions did away with standardized tests, we can be certain that more selective institutions would develop and fine tune criteria to rank high schools in terms of student quality. The criteria are readily available to do so now yet are certainly less accessible and less transparent than standardized test scores as college admissions criteria in use by institutions. It is easy to anticipate ever larger proportions of potential applicants knowing even less about what it takes to be admitted.

For all of their shortcomings, standardized tests do give institutions another indicator of the academic profile of a student, of a group of students, and of the likelihood that any given student(s) will be academically successful in some college curricula. Indeed some of the most heated discussions of the unreliability of test scores in predicting student success once enrolled is overly simplistic. While it is true that the difference between the performance of a student with a 1350 SAT score may not be substantively, significantly or even infinitesimally different than that of a student with a score of 1290, enrollment professionals at most institutions know that there are typically real performance differences between applicants in the top quartile of their applicant pool and those in the third quartile, for example. The lack of predictability between test scores and college performance appears when looking at linear statistical relationships, leading critics to assert that test scores are meaningless as predictors of student success. That may indeed be true at highly selective institutions exhibiting the narrowest ranges of score performance. At most institutions where a student population represents a wide range of test scores; there are non-trivial differences in academic outcomes across the range of academic preparation and capability that these scores reflect. There are ample reasons to question the weight of test scores in admission decisions, but defining them as inconsequential in gauging meaningful differences in students’ academic profile and likelihood of success is not warranted at most institutions.

Additionally, most senior enrollment officers admit that institutional inertia and financial expediency continues to drive the use of SAT and ACT tests in college admissions.
Despite what critics of the use of test scores in admissions may want to believe, the fact is that the primary reason for their use at most institutions is not prestige-seeking, or failure to appreciate the inherent cultural biases of the exams, or countless other such complex rationale. The primary reason is simple institutional lethargy and frugality. The persistent reliance on these most direct, parsimonious, quantifiable measures of college preparation reflects the reality that most colleges and universities have chosen not to invest the human and financial resources required to do otherwise. Colleges and universities have been using test scores for years to make admissions decisions, the admissions apparatus is well established for the use of test scores (as is the high school guidance industry) and to change wholesale to alternative indicators would be costly and disruptive. For example, the cost to hire a sufficiently large staff to adequately undertake holistic reviews or to carefully review extensive student portfolios for each applicant is considered prohibitive. One large public university recently reported having to add more than $100,000 in part-time staff to undertake a more holistic review in its admissions process. While these added costs may pale compared to other institutional investments that have lesser strategic or societal consequence, the desired efficiency of the admissions process appears to trump other interests. For example, to hire more faculty, improve classroom space, and to invest more in student support systems to increase graduation rates, making the admissions review more robust simply does not rise as an institutional priority.

**SUMMING UP**

The policy environment within which enrollment management officers seek to keep the admission process transparent, fair, efficient and accountable can hardly be characterized as static, simple or singular. It’s rapidly changing, complex, and highly heterogeneous. For example, increasing numbers of high schools are discontinuing class rankings both because of pressures from parents and the impact rank has had on the college admissibility of students. High stakes exit exams in each state remain different, making something like the A Level Exams or the use of high school exit exams non-viable substitutes for our current admissions system. The lack of an agreed upon national curriculum makes any form of achievement tests based on what is taught in high schools unachievable.

And new approaches continue to emerge. At various times the University of California and other universities have considered using subject matter tests like the SAT II tests for admissions instead of the SAT or ACT exams, but these offer no panaceas. To date there are no large scale national studies of the relationships between SAT II scores and socioeconomic status, but it is not hard to imagine that the same correlations between family income and educational background will be found. Because curricula vary, students of equal intellectual ability will be advantaged or disadvantaged depending on how similar the high school courses in history or psychology in each state are to the concepts included on the relevant SAT II tests.

From our perspective, until we have a national high school curriculum, consistent secondary school performance standards, or until we have resources at all institutions to enact holistic review, the use of standardized admissions tests may be instrumental to keeping the admission process open, fair, transparent, and efficient. Rather than being part of the problem, as often alleged, one can argue that they are also part of the solution. Nevertheless, faculty, academic policy makers, and enrollment officers have it within their authority to diminish the emphasis on SAT and ACT scores when making admissions decisions and develop a wider range of criteria that can be simultaneously—yet efficiently—considered as well in order to achieve our access and equity goals. But regretfully and realistically, colleges and universities that choose to compete for prestige in the ratings game will continue to zealously seek high test scores and define students with solid, but not outstanding test scores as at risk students.

Yet it may not be standardized test scores that represent the biggest problems with our current admissions system. Larger, yet readily resolvable, challenges may be reflected in practices like Early Admission and Early Decision; in the cynical use of SAT optional processes; in the profession’s overemphasis on and emulation of the admission practices of a highly atypical set of elite institutions; in any practices that erode principles like fairness, transparency, accountability, and equality of opportunity in the admissions process. These practices are institutional and professional choices.
But we have a “prisoner’s dilemma” to confront. Which institutions will be the first to unilaterally end practices that may be harming the admissions system as well as the credibility of non-profit postsecondary education? There are no easy answers but there are signs of hope in the growing number of discussions at the annual meetings of the NACAC, AACRAO, and The College Board and various task forces and commissions exploring these issues. We need to ensure that these policy discussions do not occur wholly within the cocoon of the admissions profession. We also need more research on these topics, research that keeps us honest, that makes the opaque more transparent, that challenges the prevailing assumptions of a deeply entrenched profession, and that forces us to have difficult discussions that we might often prefer to avoid.

The postsecondary system of education in the United States is rich and diverse, yet it deploys a discernable admissions system (if in fact we can really call it a system in the organizational and policy sense of the word) that is marked more by the similarities than the dissimilarities between institutions. Despite all of the problems with the admissions system, because of the diversity of institutions and their selectivity that reflects their distinct market position, from a national perspective our admissions system does indeed provide educational opportunity and talent development for a broad range of students. Recently Bull (in press) has argued that the opportunity for a student to gain a seat somewhere within a postsecondary system is a better indicator of educational equality than precisely which institution a student attends.

However there is no question that resource rich institutions provide more opportunities for students to succeed, and garner the prestige and position that exacerbates problems of equity and opportunity and access in American higher education. Trying to rectify these broad social challenges via overhauling the admissions process gives that process too much credit for the problems and places too much weight on it for the solution. Indeed, to achieve greater fairness and equality of opportunity in American higher education, we must certainly include our admissions system in our mix of solutions but also include a wide range of institutional academic practices, various finance and financial aid systems, federal and state policies, the K–12 system, and so on.

REFERENCES


About the Authors

DAVID H. KALSBEEK, PH.D., serves as Senior Vice President for Enrollment Management and Marketing at DePaul University in Chicago. In that capacity, he leads the marketing and enrollment development strategies for the nation’s largest Catholic university enrolling 23,000 students in nine colleges and six campuses throughout the greater Chicago region. His responsibilities at DePaul encompass enrollment management, career services and employer relations, university and media relations, marketing communications, and institutional planning and research.

A leader in enrollment management in American higher education for more than 20 years, the innovative models he has developed at DePaul have been highlighted by CASE, by The Association of Governing Boards, by The American Marketing Association, by AACRAO, and by other professional associations as examples of best practices in the field of enrollment management and marketing. He has given over 110 professional presentations, authored eighteen publications including chapters in seven books on higher education administration, and consulted with more than 40 institutions and associations.

Prior to joining DePaul in 1997, Dr. Kalsbeek served as the senior enrollment management administrator at Xavier University in Cincinnati, Ohio, and before that, at Saint Louis University in St. Louis, Missouri. Dr. Kalsbeek holds a Ph.D. in Public Policy Analysis from Saint Louis University.

DON HOSSLER, PH.D., is a Professor of Educational Leadership & Policy Studies and Director of the Project on Academic Success. He is also the Coordinator of the Higher Education and Student Affairs graduate programs. Hossler has served as the Vice Chancellor for Enrollment Services for Indiana University Bloomington, and the Associate Vice President for Enrollment Services for the seven campuses of the Indiana University system, the Executive Associate Dean for the School of Education, and Chair of the Department of Educational Leadership & Policy Studies. His areas of specialization include: college choice, student persistence, student financial aid policy, and enrollment management. Hossler has consulted with more than 45 colleges, universities, and related educational organizations including: The College Board, Educational Testing Services, the University of Cincinnati, Inter-American University of Puerto Rico, the Pew Charitable Trust, the University of Missouri, Colorado State University, the University of Alabama, and the General Accounting Office of the United States Government. He has presented more than 170 scholarly papers and invited lectures, and is the author, or co-author, of twelve books and monographs and more than 65 articles and book chapters. Hossler is currently directing funded projects of The College Board, the Lumina Foundation for Education, and the Spencer Foundation focusing on student success and persistence. He has received national awards for his research and scholarship from the American College Personnel Association and the National Association of Student Personnel Administrators.
This is the fourth in a series of articles in College and University describing an attrition prediction and intervention project at the University of South Florida (USF) in Tampa. The project was first described in the 83(2) issue (Miller 2007). The statistical model for predicting attrition was presented in the 83(3) issue (Miller and Herreid 2008). The methods and approaches for intervening with students at highest risk of attrition were presented in the 84(3) (Miller and Tyree 2009).

In this article, the researchers will describe the updated version of the prediction model. The original model was developed from a sample of about 900 First Time in College (FTIC) students enrolling at USF in the summer or fall of 2006. Due to refined practices in survey administration and data collection, the subsequent model was developed with data from about 2,700 FTIC students, generating a model in which the researchers had more confidence.
It is common for colleges and universities to develop programs and activities for the purpose of enhancing student persistence...

...but, commonly, such efforts are broadly applied, such as assistance programs directed at all freshmen. Some efforts are somewhat more narrowly applied, such as programs for first generation students or those on academic probation or who otherwise exhibit a single risk factor for attrition. However, even those programs typically provide assistance or support to a wide collection of students. Such widely applied programs may be sound for educational reasons; but, as persistence enhancement initiatives, they are often wasteful because they include many participants who would have remained enrolled at the institution without any treatment. Such programs cannot take advantage of the fact that multiple characteristics often predict attrition.

The project described is intended to identify individual students who are at risk based upon a variety of factors. Given the size of the data set, it actually considers several dozen variables from survey data and from institutional data. When individual students are found to be at risk, and there is confidence in the basis for the discovery, appropriate personnel can contact them and begin the process of developing plans to enhance the chance of persistence by the individual student (Glynn, Sauer, and Miller 2005). The efficiency and cost effectiveness of this approach, especially at large institutions, is appealing to involved administrators and managers.

This project also has appeal to practitioners because the model relies entirely on pre-matriculation characteristics of entering new students. That allows for a timely response to the students identified as at risk and gives the institution an opportunity to craft a legitimate early intervention program that can start even before the individual student gives any signal of disconnecting or disengaging from the university, perhaps even before the student has given thought to dropping out.

In this article, we will describe the process of developing the predictive model and then present the specific elements of the model. We will also describe the process of developing interventions on behalf of individual students found to be at risk. Finally, we will discuss the implications for differences between the first model and the later one, and we will present aspects of future research that we will undertake.

**METHODOLOGY**

Data for the study were obtained from university databases and the College Student Expectations Questionnaire (CSXQ) (Gonyea 2003; Kuh and Pace 1998), which
Table 1.
Independent Variables in the Analysis

<table>
<thead>
<tr>
<th>Block</th>
<th>Variable Name</th>
<th>Categorical/Continuous</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gender</td>
<td>Dummy-2 M,F</td>
<td>Reference: Male</td>
</tr>
<tr>
<td>1</td>
<td>Ethnic</td>
<td>Dummy-4 A,B,H,W</td>
<td>Reference: White</td>
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<tr>
<td>1</td>
<td>Major_code</td>
<td>Dummy-11 Top 10 majors + &quot;Other&quot;</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>1-Other; 2-Pre-Med; 3-Business; 4-Engin; 5-Psychology; 6-Biology; 7-Pre-Nursing, 8-Architecture, 9-Communications, 10-Political Science, 11-Undeclared</td>
<td>Reference: &quot;Undeclared&quot;</td>
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<tr>
<td>1</td>
<td>Honors Program</td>
<td>Dummy-2 yes or no</td>
<td>Reference: Yes</td>
</tr>
<tr>
<td>1</td>
<td>Summer Program</td>
<td>Dummy-2 yes or no</td>
<td>Reference: Yes (1)</td>
</tr>
<tr>
<td>1</td>
<td>Athlete</td>
<td>Dummy-2 0 or 1</td>
<td>Reference: Yes(1)</td>
</tr>
<tr>
<td>1</td>
<td>Residence status</td>
<td>Dummy-2 R or C</td>
<td>Reference: Residential</td>
</tr>
<tr>
<td>1</td>
<td>High School GPA</td>
<td>2.00–4.95</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>SAT Combined (math &amp; verbal)</td>
<td>780–1560; ACT scores converted</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Time elapsed between application and enrollment</td>
<td>Days</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Time elapsed between orientation and enrollment</td>
<td>Days</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Library and Info Tech Scale</td>
<td>12-low, 36-high</td>
<td></td>
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<tr>
<td>2</td>
<td>Experiences with Faculty Scale</td>
<td>7-low, 28-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Course Learning Scale</td>
<td>13-low, 36-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Writing Scale</td>
<td>5-low, 20-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Campus Facilities Scale</td>
<td>9-low, 36-high</td>
<td></td>
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<tr>
<td>2</td>
<td>Clubs, Organizations, Service Projects Scale</td>
<td>5-low, 20-high</td>
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<td>2</td>
<td>Student Acquaintances Scale</td>
<td>7-low, 28-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Scientific &amp; Quant Experiences Scale</td>
<td>5-low, 20-high</td>
<td></td>
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<tr>
<td>2</td>
<td>Conversation Topics Scale</td>
<td>10-low, 40-high</td>
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<td>2</td>
<td>Information in Conversations Scale</td>
<td>6-low, 24-high</td>
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<td>2</td>
<td>Read non-assigned books</td>
<td>1-low, 5-high</td>
<td></td>
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<tr>
<td>2</td>
<td>Read textbooks/assigned books</td>
<td>1-low, 5-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Write term papers</td>
<td>1-low, 5-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Write essay exams for courses</td>
<td>1-low, 5-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Will you like college?</td>
<td>1-low, 4-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Academic, scholarly development</td>
<td>1-weak emphasis, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Aesthetic, expressive, creative dev</td>
<td>1-weak, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Critical, evaluative dev</td>
<td>1-weak, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Appreciation of human diversity dev</td>
<td>1-weak, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Info literacy skills dev</td>
<td>1-weak, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Vocational competence dev</td>
<td>1-weak, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Personal relevance/practical value of courses</td>
<td>1-weak, 7-strong</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Relationships wi other students</td>
<td>1-alienated, 7-friendly</td>
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<tr>
<td>2</td>
<td>Rel’s with faculty</td>
<td>1-remote 7-approachable</td>
<td></td>
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<tr>
<td>2</td>
<td>Rel’s with administrators</td>
<td>1-impersonal 7-helpful</td>
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<tr>
<td>2</td>
<td>Expected grades</td>
<td>5-A, 1-C or lower</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Advanced degree plans?</td>
<td>Dummy, 1-yes 2-no</td>
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<tr>
<td>2</td>
<td>Credit hours planned</td>
<td>1-few, 5-many</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Study hours per week</td>
<td>1-low, 7-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Work on campus</td>
<td>1-none, 6-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Work off campus</td>
<td>1-none , 6-high</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Who will pay expenses?</td>
<td>1-all self, 4-all other</td>
<td></td>
</tr>
</tbody>
</table>

1 Dummy variable values if created, Reference value if categorical
was administered to incoming FTIC freshmen in the fall of 2007. Participants in the study were 4,212 new FTIC students who enrolled at the main campus of the University in the fall of 2007 and also new FTIC students in the summer 2007 term who returned for the fall. Of these students, 57 percent were women and 37 percent were minority. More than 95 percent of the new FTIC students were from Florida. Of the overall group, 85.7 percent returned to the University for the fall 2008 term. About two thirds of the incoming freshmen (64%) completed the survey and almost all of them provided identifying information that would allow the matching of survey results to information about students available from the University’s standard databases.

As in previous years, 99 percent of the entering FTIC freshmen were aged eighteen or nineteen, so the analysis was restricted to this age group. American Indian/Alaskan Natives and people who indicated “Other” as their race were also present in very small numbers and were excluded from the analysis for this reason. Therefore, it should not be assumed that results from this study will generalize to those groups.

Logistic regression was used to develop the regression model. This form of regression analysis is used when the dependent variable, in this case persistence from fall 2007 to fall 2008, is categorical, rather than continuous. Both categorical and continuous independent variables, drawn from the University’s database as well as from the administration of the CSXQ, were used to predict retention.

Table 1 shows independent variables used in the analysis. CSXQ items were combined into several scales as indicated by the authors. In some cases, scales were missing one or more variables. Because the SAS logistic regression procedure uses casewise deletion, one missing item will cause the whole case to be deleted from the analysis. For this reason, in cases where fewer than half of the component variables were missing, imputed values were substituted for the missing data.

RESULTS

The PROC LOGISTIC procedure in SAS was run using setwise inclusion of variables. Returning for the fall 2008 term was the dependent variable. Block One variables included mainly demographic-type items available from the University’s standard student databases. Block Two variables included all of those variables, along with scales and individual items from the CSXQ. The two blocks of variables appear in Table 1. Sex, race/ethnic group, major status, honors program status, summer program participation, residential housing status and interest in obtaining an advanced degree were categorical independent variables and, hence, entered the analysis as dummy variables.

The first step in the logistic regression analysis was to construct a model and then determine how well the overall model fit the data (Menard 2002). In contrast to ordinary least squares regression, where parameters of the model are estimated using the least-squares method, in logistic regression, model parameters, including the coefficients associated with the independent variables, are estimated using the maximum-likelihood method (Pampel 2000). The log likelihood value (LL) can be used to determine how well the model fits the data. The change in log likelihood when the independent variables are included in the model compared to a model that excludes them is observed. Differences between the log likelihoods of each model multiplied by -2 (-2LL) can be interpreted as a X² statistic (Menard 2002). The X² value can be used along with the chi-square table with degrees of freedom equal to the number of independent variables to test the null hypothesis that all coefficients are equal to zero. This is similar to the use of the F-test in least-squares regression. The percentage of cases correctly predicted compared to the baseline probability of the dependent variable may also be considered to judge how well the model fits the data.

If a significant model chi-square is observed, the next step is to evaluate the “contribution of each independent variable to the model by testing for its statistical significance and then examining the substantive significance of its effect on the dependent variables” (Menard 2002, p. 41). The Wald statistic, which has a chi-square distribution, can be used to test the null hypothesis that a coefficient is equal to zero. Unstandardized coefficients show the change in the dependent variable (or, rather, its logit) for every unit change in the independent variable. The unstandardized coefficients can also be used in an equation to predict the dependent variable for a new group of cases for which the independent variables are known but the dependent variable is not known.

Unstandardized coefficients are presented in their natural units of measurement. The size of the units used
to measure each independent variable can obscure the importance of one independent variable compared to another. Standardized regression coefficients deal with the measurement problem by indicating how many standard deviations the logit of the dependent variable changes as a result of a one standard deviation change in the independent variable. Thus, the standardized coefficients show the importance of each variable, controlling for all of the others, on the logit and may be used to compare the strength of the relationship between the dependent variable and different independent variables. Menard (2002) states that standardized coefficients produced in SAS are only partially standardized and recommends a formula to produce completely standardized coefficients (p. 53). The standardized coefficients reported here were calculated using this formula.

Because unstandardized and standardized coefficients deal with logits, both can still leave doubt about the relative impact of independent variables on the dependent variables in the regression analysis. The Delta-p statistic has come into use to more clearly display the effect that independent variables have on the outcome variable (Cabrera 1994). “Delta-p is the impact that each significant variable makes on the probability of retention, controlling for all other variables in the model” (Ronco and Cahill 2006). A formula developed by Peterson (1985) can be used to calculate Delta-p. For continuous variables in the model, Delta-p represents an estimate of the change in probability of the dependent variable based on a one-unit change in the independent variable. For categorical variables, Delta-p represents an estimate in the change in probability of the dependent variable compared to the reference value.

Diagnostics performed on the data prior to analysis included checks of tolerances in a regular regression analysis to determine if multicollinearity between variables was present. This procedure was carried out for both blocks of variables. One variable, location of origin, was eliminated from the Block One analysis due to high tolerance. The variables location of origin and whether parents had college degrees were eliminated from the Block Two analysis due to high tolerances.

### ANALYSIS OF BLOCK ONE (FROM UNIVERSITY DATABASES)

Model indicators for analysis of Block One variables appear in Table 2. The overall retention rate for this group (N = 3,484) from fall 1 to fall 2 was 86.9 percent. The value of \(-2LL\) for the analysis including Block One indicates that there was significantly better prediction of the dependent variable obtained when Block One variables were included in the model compared to a model that included no independent variables (\(-2LL = 110.1986 (df = 22), p < 0.0001\)).

Table 3 shows unstandardized coefficients and standardized coefficients for the Block One variables. Delta-p values appear only for significant coefficients. The Delta-p values show that retention increased approximately 8 percent based on each one-point increase in high school GPA, and that Asian students showed 6 percent higher retention and Black students showed 5 percent higher retention than White students. Commuters showed a 3 percent lower retention rate than students who lived on campus. Time elapsed since orientation (attending an early orientation) showed a very small positive relationship with retention, such that students who attended an earlier orientation were more likely to be enrolled one year later.

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**Table 2. Model Indicators**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline p (%)</td>
<td>86.9</td>
<td>87.1</td>
</tr>
<tr>
<td>Model N</td>
<td>3,484</td>
<td>2,088</td>
</tr>
<tr>
<td>(-2) Log L Intercepts Only</td>
<td>2707.812</td>
<td>1604.249</td>
</tr>
<tr>
<td>With Covariates</td>
<td>2597.614</td>
<td>1459.811</td>
</tr>
<tr>
<td>Likelihood Ratio Chi-square (df)(^1)</td>
<td>110.1986(22)</td>
<td>144.4381(54)</td>
</tr>
<tr>
<td>Adjusted Pseudo R(^2)</td>
<td>0.0576</td>
<td>0.1246</td>
</tr>
<tr>
<td>Correctly Predicted (%)(^3)</td>
<td>79.5</td>
<td>79.3</td>
</tr>
</tbody>
</table>

\(^1\) p < 0.0001  
\(^2\) Max rescaled R\(^2\)  
\(^3\) Predicted prob = 0.8
### Table 3.
Analysis of Effects, Block 1 and Block 2 Variables

<table>
<thead>
<tr>
<th>Effect</th>
<th>Block 1</th>
<th>Block 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unstandardized Coefficient</td>
<td>Standardized Coefficient</td>
</tr>
<tr>
<td>Intercept</td>
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<td>-2.11900</td>
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<td>High School GPA</td>
<td>1.06990 1</td>
<td>0.1454</td>
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<td>Gender F</td>
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<td>-0.0023</td>
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<td>Ethnic A</td>
<td>0.71670 2</td>
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<tr>
<td>Ethnic B</td>
<td>0.48850 2</td>
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<td>SAT Combined</td>
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<td>Major code 2</td>
<td>0.02620</td>
<td>0.0031</td>
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<tr>
<td>Major code 3</td>
<td>0.11270</td>
<td>0.0112</td>
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<td>Major code 4</td>
<td>0.14280</td>
<td>0.0135</td>
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<td>Major code 5</td>
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<td>Major code 6</td>
<td>-0.07600</td>
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<td>Major code 7</td>
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<td>Major code 8</td>
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<td>Major code 9</td>
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<td>Major code 10</td>
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<td>Athletics_BA2</td>
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<td>Residence Status-Commuter</td>
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<tr>
<td>Time Elapsed Since Orientation</td>
<td>0.00767 2</td>
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<tr>
<td>Library &amp; Info Tech Scale</td>
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<tr>
<td>Experiences with Faculty Scale</td>
<td>0.00362</td>
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<td>Course Learning Scale</td>
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<td>Writing Scale</td>
<td>-0.03850</td>
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<td>Campus Facilities Scale</td>
<td>0.00339</td>
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<td>Clubs, Organizations, Service Projects Scale</td>
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<td>Student Acquaintances Scale</td>
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<td>Scientific &amp; Quant Experiences Scale</td>
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<td>0.0037</td>
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<td>Conversation Topics Scale</td>
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</tr>
<tr>
<td>Information in Conversations Scale</td>
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<td>Read non-assigned books</td>
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<td>Read textbooks/assigned books</td>
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<td>Will you like college?</td>
<td>0.28360</td>
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<td>Write term papers</td>
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<td>Write essay exams for courses</td>
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<td>Academic, scholarly development</td>
<td>0.12380</td>
<td>0.0320</td>
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<tr>
<td>Aesthetic, expressive, creative dev</td>
<td>-0.17580</td>
<td>-0.0604</td>
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1 p <= 0.0001
2 p < 0.01
3 p < 0.05
4 p < 0.005

*TABLE CONTINUED ON NEXT PAGE...*
Table 3.
Analysis of Effects, Block 1 and Block 2 Variables

<table>
<thead>
<tr>
<th>Effect</th>
<th>Block 1</th>
<th></th>
<th>Delta P (%)</th>
<th></th>
<th>Block 2</th>
<th></th>
<th>Delta P (%)</th>
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<tbody>
<tr>
<td></td>
<td>Unstandardized Coefficient</td>
<td>Standardized Coefficient</td>
<td></td>
<td></td>
<td>Unstandardized Coefficient</td>
<td>Standardized Coefficient</td>
<td></td>
</tr>
<tr>
<td>Critical, evaluative dev</td>
<td>0.0889</td>
<td>0.0284</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appreciation of human diversity dev</td>
<td>-0.0070</td>
<td>-0.0025</td>
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**ANALYSIS OF BLOCK TWO (BLOCK ONE AND CSXQ DATA)**

Model indicators for analysis of Block Two variables appear in Table 2 (on page 16). The overall retention rate for this group (N = 2088) from fall 2007 to fall 2008 was 87.1 percent. There was significantly better prediction of the dependent variable obtained when Block Two variables were included in the model compared to a model that included no independent variables (-2LL = 144.4381 (df= 54), p < 0.0001).

Unstandardized coefficients and standardized coefficients appear in Table 3. Delta-p values appear only for significant coefficients and show that retention increased approximately 8 percent based on each one-point increase in high school GPA, and that Asian students showed nearly 6 percent and Black students showed a 5.5 percent higher retention than White students. A very small percentage decrease in retention was associated with higher SAT combined scores. With regard to CSXQ items, higher scores on the scale representing use of library and internet resources were associated with a very small increase in retention (0.4% per unit increase). Expecting to read many non-assigned books was associated with a 2 percent decline in retention per unit as the value of that measure increased. Enthusiasm about attending the university was related to a 3 percent increase in retention per unit increase in that item. A CSXQ item representing the extent to which students feel that developing aesthetic, expressive and creative qualities would be emphasized at the institution was associated with a 1 percent decline in retention per unit increase in that item. Working off campus was associated with a 2.9 percent decline in retention per unit increase in that measure.

**PREDICTING NEW CASES**

Focusing on the second analysis (Block Two variables), the factors identified as of predictive worth (with the direction of predicting persistence provided) that can be used to predict retention in new cases are:

- High school GPA (+);
- Being Asian vs. being White (+);
- Being Black vs. being White (+);
- Scoring higher on the SAT Combined measure (-);
- Expecting to use library and internet resources (+);
- Expecting to read many non-assigned books in college (-);
Being enthusiastic about college (+);
Believing that the university will emphasize developing aesthetic, expressive and creative qualities (−); and
Expecting to work off campus while in college (−).

For each new case the probability that the student will be retained can be derived from the following equation:

$$\text{logit}(Y) = -2.1190 + (1.3336)(\text{High School GPA}) + (0.8039)(\text{EthnicA}) + (0.8105)(\text{EthnicB}) + (0.1913)(\text{EthnicH}) - (0.00161)(\text{SATComb}) + (0.0535)(\text{Library & Info Tech Scale}) - (0.1889)(\text{Read non-assigned books}) + (0.2836)(\text{Will like College}) - (0.1758)(\text{Aesthetic emphasis}) - (0.1860)(\text{workoffcampus})$$

The coefficients are those that appear as unstandardized coefficients in Table 3 (on page 17). The computer program produces odds from logit(Y), and then applies a formula to the odds to yield a probability of persistence between 0 and 1 for each new case. The formula can be applied and new students sorted into “at-risk” and “not-at-risk” groups based on their probability of persistence. Groups may receive treatment as needed.

**DISCUSSION**

There are differences and similarities between the original predictive model and the latest one. Consistent between the two is the presence and relative power of high school grades as positively associated with persistence. Also present in both models are being Black as opposed to being White (positive), expecting to read many non-assigned books in college (negative), and expecting to work off campus (negative). The continued presence of these factors in the model seems to affirm their value. In the original model but not in the more recent one are these factors: expecting to participate in student clubs and organizations (a positive predictor of persistence) and expecting to read assigned textbooks (positive).

Factors included in the latest model but not in the first one are: being Asian as opposed to being White (a positive predictor of persistence), having a higher combined SAT score (a negative predictor), expecting to use the library and internet resources (positive), being enthusiastic about college (positive), and believing that the university will emphasize aesthetic and creative qualities (negative).

The reader may be tempted to try to understand the reasons for various factors being in the model or not, but it is useful to remember that, although these factors have predictive merit, they do not necessarily have a causal relationship with attrition. Whether a student indicates an interest in joining clubs or in using the library and internet resources at a high level, they are both forms of engagement and involvement in institutionally-connected activities and good indicators of persistence.

While the model was being developed, USF officials were hard at work trying to affect the persistence rate of FTIC students. New initiatives since data collection began in this project are: a substantial enhancement in the new student orientation program, the development of a first year student connections office and associated programs, the creation of several new positions for academic advisors, the establishment of a call and e-mail system to stimulate student registration for those who were late doing so, and the implementation of a system to track student enrollment with an eye to supporting and encouraging full-time enrollment.

All of those initiatives seem to have had an effect on first-year student persistence. The freshman-to-sophomore persistence rate had hovered around 81 percent for the prior ten years, but the cohort that began in the summer or fall of 2007, the basis for this latest model, persisted at a rate of 85.7 percent. That higher rate of persistence gives the model less margin for error, but, even though it may make it more challenging to develop a highly accurate predictive model, it is certainly a good development for USF. The modest improvement of first-year persistence is reassuring, but the reader is reminded that the four-year graduation rate for USF has been about 23 percent, so more time is needed to determine whether the University will be experiencing a lasting effect of its efforts.

The researchers will apply the current model to the class entering in the summer or fall of 2009. A population of those students most at risk will be selected for intervention, and through the Mentoring Program (Miller and Tyree 2009), administrators at USF will structure interventions for the students who are most at risk of attrition. Another near future development is that in the fall of 2009, the University will know the persistence rate of the class that entered in 2008 and experienced the Mentoring Program intervention. Those results will inform future practice.
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CONCLUSION AND NEXT STEPS

The premise of this project is that college student attrition is as highly individual and personal as any other aspect of the college-going experience. Students make decisions about matriculation (to stay or depart) based upon complicated and complex factors that have unique meaning to the individual, and they cannot be treated in the aggregate. The project attempts to collect a wider range of information associated with student plans, experiences, and characteristics to provide a broader composite of information about persistence and predict risk of attrition based upon that wide range.

As previously indicated, the research team expects to have results to report regarding the persistence of the group entering in 2008 by fall 2009. Although there are no specific targeted goals for improving freshman-to-sophomore retention, an improvement is expected. In the meantime, more studies will be initiated with the same data set, with more subjects added with each entering class.

The research team expects to develop a model to follow the students in the original data set into what would be their junior year, and predict sophomore attrition, based upon data collected for the current model, supplemented by data drawn from the real experiences of students, such as academic performance, actual major chosen, residence status, and participation in student organizations. Attrition following the sophomore year is a significant problem for the University because a number of selective colleges (such as Nursing, Business, and Education) govern admission to their programs in the junior year. Students who fail to gain admission to those colleges may choose other educational options outside of the University as an alternative to pursuing a different area of study at USF. Trying to determine what factors help discern between those who persist to the junior year and those who do not is a worthy activity and of value to USF decision makers.

The research team will also begin developing strategies for collecting data from the population of incoming transfer students, which is a larger and probably more complex group than the FTIC collection. USF has one of the largest transfer student populations in the country, with about 11,000 students admitted in each of the past several years. The rate at which they persist to degree completion is better than that of first-time-in-college (FTIC) students, but there are so many of them, any improvement in their rate of persistence may be impactful. Determining what should be the elements of a database intended to predict attrition of transfer students will be complicated, but, given the size of the collection and the stakes associated with persistence, it is a necessary additional step.

REFERENCES


Miller, T.E. and T.M. Tyree. 2009. Using a model that predicts individual student attrition to intervene with those who are most at risk. College and University. 84(3): 12–19.


About the Author

CHARLENE HERREID is Director of Student Affairs, Planning, Evaluation and Assessment at the University of South Florida. She previously served as Director of Institutional Research at Saint Leo University for nine years. She received her bachelor’s, master’s, and Ph.D. degrees in Psychology from the University of Miami (Florida).

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The purpose of this qualitative study is to analyze and understand what information students seek from a college’s Web site during their college search. Often, college Web sites fail either to offer students an interactive dialogue or to involve them in the communicative process, negatively affecting students’ college search. The results of the research suggest that prospective students rely heavily on information presented on a college’s Web site, to the extent that the information available will either encourage or discourage their college choice. Prospective and current students utilize college Web sites because of their convenience and speed. Information most searched includes majors and tuition, followed by ranking, size, and location, as well as pictures, videos, and virtual tours. Student message boards and blogs (e.g., Facebook and ratemyprofessor.com) also are highly sought out by college seekers, though most colleges do not feature links to these sites on their own Web sites.
These words have penetrated our everyday lives. Americans now are more engaged with the Internet than with any other medium (e.g., television, radio, newspapers, magazines, film, and recorded music). According to Stoner (2004), “...teenagers spend more time surfing the Internet and sending e-mail and instant messages to each other than watching TV” (p. 811). On average, undergraduate students spend 18 hours each week “...doing online activities for school, work, and recreation” (Caruso and Salaway 2007, p. 5).

The computer and the Internet are commonplace in today’s educational settings. Children are introduced to the computer and the Internet in elementary school (Mentz and Whiteside 2003), with the result that they are technologically savvy by the time they enter institutions of higher learning. The Internet is particularly pervasive, because unlike any other medium, it can be viewed live, read as text, heard as sound, seen as pictures, and engaged by film. Thus, its ability to be interactive surpasses all other media except cable television (Croteau and Hoynes 2003).

Until the introduction of the Internet, all media were not interactive (Emanuel et al. 2008). Rather, the media constituted one-way communication—communication that did not encourage a dialogue. Interactive is defined as a medium that provides for two-way communication,
“...not simply one that offers a range of choices” (Croteau and Hoynes 2003, p. 301). Two-way communication is pivotal to end-users, because it allows and encourages feedback. Feedback is valued because it is how prospective consumers turn into customers (i.e., enrolled students). In today’s marketplace, customers thrive on feedback because it gives them a sense of connectedness to brands (i.e., the college). Connectedness is the foundation of the Internet’s success, because it promotes social relationships. Whether the relationship is in one’s own city, out of state, or in another country, the Internet can “take you there”—hence, the user is part of a virtual community (Rheingold 1993). Students searching institutions of higher learning can take advantage of the virtual community by tapping into an institution’s Web site. Aside from assessing information commonly found on a college’s Web site (e.g., tuition, major, classes, and financial aid) (Maskiewicz 2000), prospective students can speak with current students about the institution’s advantages and disadvantages, discuss course curriculum with professors, develop a relationship with admissions and financial aid representatives, and strategize plays with a coach.

According to Stoner (2004), “...a college’s Web site is rated as one of the top sources of information during the college-search process” (p. B11). More recently, Cooper and Burns (2007) stated, “Web sites for colleges and universities have become the primary means for students to obtain information in the college search process” (p. 203). Thus, more and more higher education seekers are searching college Web sites and other information available on the Internet before making a college choice. Nevertheless, the National Research Center for College and University Admissions found a majority of college and university Web sites to be lacking in regard to features found to be important to prospective students in their school search process (Cooper and Burns 2007; Scott 2006).

Colleges need to place more emphasis on media that are interactive. As the higher education arena continues to grow and vie for consumers’ (i.e., students’) attention, it will be imperative to college recruiting efforts to engage in two-way communication—communication that can only occur via their Web sites. The purpose of the present study is to highlight how colleges can promote and sustain an interactive Web-based dialogue with prospective and current students during students’ college search and beyond. The proposed research question is: What information is sought online during prospective applicants’ college search?

**LITERATURE REVIEW**

The number of institutions of higher education has increased substantially over the last 350 years. Currently, there are more than “...3,100 baccalaureate-granting institutions, each with its own unique purpose, history, student body, and faculty” (Nafukho and Burnett 2002, p. 3). Higher education has been immune to an interactive dialogue with prospective and current students, because the influx of students after World War II provided colleges with a robust enrollment (Nafukho and Burnett 2002). Beginning in 1975, enrollment slowly declined until 1985 (Nafukho and Burnett 2002). Since the turn of the 21st century, higher education has begun to witness an increase in enrollment as a result of an increase in the number of high school graduates; these individuals have been connected to the Internet since they were in elementary school. The National Center for Educational Statistics (NCES) (2005) projects that between the years 2000 and 2011, the total enrollment at all degree-granting institutions (associate, baccalaureate, and higher degree) will increase by 19 percent. The number of so-called traditional students (those between the ages of 18 and 24 years) also is projected to increase.

The plethora of higher education options available means stiffer competition (Cooper and Burns 2007; Nafukho and Burnett 2002). Colleges will generate more and more “noise” in order to be heard above the competition (i.e., other higher learning institutions). Colleges that understand the power of two-way communication and its ability to attract and retain students will prevail. Two-way communication provides students with a voice—one that enables students to express their thoughts, desires, and concerns. Two-way communication is vital to one’s identity (who we are) and social needs (pleasure, affection, inclusion, escape, relaxation, and control) (Adler and Rodman 2003). Thus, two-way communication is differentiated from other forms of communication (e.g., linear) because the senders and receivers of messages are offered the opportunity to respond. “[C]ommunication is not something we do to others; rather it is something we do with them” (Adler and Rodman 2003, p. 15).
Prospective students desire a dialogue about higher education options because “...people approaching a choice among unfamiliar options seek information on how to structure the problem” (Wright and Rip 1980, p. 117). Often, they will seek advice from social influencers, such as high school counselors and teachers, adult acquaintances, older siblings, and peer groups (Cole 2006; Johnson and Stewart 1991; Wilson 1971), because they provide information, offer means of comparison, and lend guidance (Wells, Moriarty, and Burnett 2006). The Internet, ever more prominent in our technology-driven society, is another way in which higher education seekers learn about college options. More specifically, a college’s Web site is the portal to students’ interactive search, providing a means of communication, access to tools such as databases and directories, and targeted information (Middleton, McConnell, and Davidson 1999). In addition, a college’s Web site is “...associated with perceptions of having gotten more realistic information about the university” (Rozelle and Landis 2002); perhaps most important, it is available 24x7, offering prospective and current students greater flexibility (Rozelle and Landis 2002) and information upon demand (Stoner 2004).

Little empirical research has analyzed college Web sites and their effect during the search process. To date, only two studies have analyzed the effect on prospective students. The 2007 Cooper and Burns study was conducted as part of a redesign effort for a specific college’s Web site. The 2001 study sought to identify which elements high school juniors and seniors found engaging and inhibiting as well as which motivated them to submit an application. (The 2001 study is more reflective of the current study.)

Since 1998, colleges have placed increasing emphasis on restructuring their Web sites so they are attractive and relevant to prospective students’ wants and needs. Nevertheless, many Web sites still reflect colleges’ “egocentric” (Mentz and Whiteside 2003) nature, which assumes that prospective students understand a college’s organization and structure. According to Mentz and Whiteside (2003), this is a “...shaky assumption at best” (p.11). In contrast, colleges that have “...reorganized and rebuilt their sites to meet the needs and expectations of external audiences, rather than those already familiar with the institution, have reaped major benefits” (Stoner 2004, p. B11).

Several colleges/universities have used prospective and current students’ needs and wants to guide their Web design. Albion College’s first-ever “virtual open house,” held on a Sunday evening, yielded more than 500 visitors and 200 prospective students. The open house, which featured chat sessions, exceeded all “real” open houses in terms of numbers of people served (Belsie 1998). The University of Buffalo also has realized the power of student-centered Web sites. As part of its effort to enhance recruitment, the University used a custom-designed Web site that enabled students to create their own schedules in areas such as “…academics, campus life, financial aid, or technology....” (Belsie 1998, p. B7). Hamilton College used a similar student personalization recruitment strategy. After completing an online form, prospective students were directed to “My Hamilton,” a personalized Web site targeted to each prospect’s “…specific interests, that delivers relevant news, events, features, and links....” (Stoner 2004, p. B10). “My Hamilton” was redesigned in 2003 to include prospective and admitted students deciding whether to enroll. After My Hamilton was redesigned, Stoner (2004) reported, “For the class of 2007, Hamilton’s yield for students who began using ‘My Hamilton’ as prospects was 56 percent, as opposed to 21 percent for nonusers” (Stoner 2004, p. B10).

Furman University took a more interactive approach to Web site recruitment: It was one of the first universities to feature student Weblogs on its admissions link. The Weblogs increased the number of visitors returning to the site and increased contact with prospective students. Lewis & Clark College also tapped into the interactive benefit of its Web site by offering a link titled “Real Life at Lewis & Clark College.” The link showcased non-censored blogs of selected students as a means of communicating the varying interests, needs, and wants of prospective and enrolled students. The college reported the greatest numbers of hits on Thursdays, presumably because new blogs were showcased on Wednesdays (Stoner 2004).

If college Web sites are not sufficiently student-centered, then institutions should seek to modify their design, content, and navigation with an eye toward “...the mindset of the student. They should articulate benefits and clearly link connections for those unfamiliar with the academy” (Mentz and Whitehead 2003, p. 12). Similarly, Cooper and Burns (2007) contend that college Web sites
must focus on visitor needs and on the interests of the targeted population. Stoner (2004) reports on one college which understood the needs of its targeted population: Wake Forest University School of Law. “More logical navigation, nomenclature, interface, and architecture helped boost the school’s yield from 33 percent to 42 percent during its first admissions season in 2003” (p. B12).

THEORETICAL FRAMEWORK

Interpretation enables the researcher to untangle webs of meaning that develop when participants are exposed to and interact with different people, places, and ideas. Interpretation answers the question, “What are the meanings in the data?” (Gay and Airasian 2000). Geertz (1973) contends that interpretation “…illuminates the meanings and conceptual structures that organize a subject’s experience” (p. 27). More precisely, interpretive interactionism is applied to this research project because it combines symbolic interactionism and interpretive inquiry (Blumer 1969; Denzin 1992, 2001). The combination highlights a thorough understanding of interpretive thought and the presence of symbolic undertones.

CONCEPTUAL FRAMEWORK

To understand the search and college choice process, Hossler and Gallagher’s (1987) three-stage model of college choice is used in this study. The first phase of the model is called predisposition. It “…refers to the plans students develop for education or work after they graduate from high school” (Hossler, Schmit, and Vesper 1999, p. 9). This phase also includes other college influencers, such as family, peers, and academics. Search is the second phase of the college choice model. In this phase, students explore various college options and gather information about each college’s characteristics. The last phase is choice. It is at this moment that a student will narrow his/her college choices and decide to enroll at a specific college (Hossler, Schmit and Vesper 1999). Because this study examines college Web sites’ effect on students’ search, the relevant stage for this study is search. It is during the search phase that college-bound students receive information from colleges—information that ultimately will determine their college choice. This is the stage that addresses the question, “How do students learn about college options?” (Hossler, Schmit, and Vesper 1999, p. 53).

METHOD

This qualitative study investigated the information college seekers look for on a college’s Web site during their college search. Undergraduate participants were selected on the basis of their availability and accessibility. Berg (2001) defines this as a convenience sample because the “…category of sample relies on available subjects” (p. 23). The participants were invited to take part in this study because they were college students and so were engaged in the college experience. Undergraduate students thus contributed rich data to the research. Prior to attending college, study participants had held preconceived notions about college. Among the questions these students had entertained before enrolling in college were “Should I attend college?” “Which college should I attend?” “What is college about?” To answer these questions, they browsed solicited and unsolicited information (e.g., brochures, catalogs, and fliers) from colleges. In addition, they may have paid attention to radio, television, and billboard advertisements. Some may have visited colleges that appeared to meet their needs, wants, and interests. Some may have used their personal computers to download school literature (Hebel 1993); take a virtual tour; or chat with matriculated students.

Undergraduate students rather than high school juniors and seniors also were asked to participate in this study because they “…represent the first generation raised in an environment of media technology. From birth, they have been exposed to media technology that was not invented in previous generations” (Emanuel et al. 2008, p.14). Caruso and Salaway (2007) add, “These students, many of whom have never known a world without personal access to information technologies, often take them for granted and integrate them seamlessly into their daily lives” (p.1).

According to a study of 27,846 undergraduate students at 103 institutions, 98.4 percent of respondents own a computer; only 1.6 percent do not have a computer (Caruso and Salaway 2007, p. 4). Undergraduate students have had the opportunity to navigate through a plethora of college Web sites. They have a clear understanding of what they like and dislike when searching information on a college’s Web site. In contrast, high school juniors and seniors may not know what information to look for. As Burk (2007) questions, do they know what to look for once they have arrived at the specified college Web site? Do these soon-to-be high school graduates understand how to weigh the
pros and cons of information presented on a college’s Web site (Cole 2006)?

Study participants are students enrolled in media studies courses at a public, four-year institution in St. Louis, Missouri. Participants’ age and nationality were not considered given the campus’s diverse student population. In fact, the diversity of the campus increases the generalizability of the study findings. The final data set is 88 undergraduate students.

The qualitative research method used to understand the proposed research question was focus group interviewing; this method was selected for several reasons: First, this method encourages subjects to speak freely, completely, and without criticism about the “...behaviors, attitudes, and opinions they possess” (Berg 2001, p. 111). Second, focus group interviewing creates a “synergistic group effect,” which lends to greater ideas, analysis, and discussion about the given topic (p. 112). Third, and most important, this method is based upon interaction. “Meaning and answers arising during focus group interviews are socially constructed rather than individually created” (p. 115). Focus group interviewing was imperative for this study because the process of selecting a college occurs socially (i.e., symbolic interactionism). After the focus group, the researcher bracketed the data (Berg 2001).

Prior to the onset of data collection, research participants were asked the research question. The media studies classes were not divided into subgroups because doing so might have tainted the data. The students were familiar with one another and, for the most part, were comfortable speaking freely and sharing their thoughts on a given topic. Dividing the research participants might have induced anxiety in some participants when their fellow classmate(s) were removed from the classroom. To elicit the most discussion about college Web sites’ effect on students’ college search, the researcher crafted a series of discussion questions in an effort to understand the deep structural elements of the search process (Berg 2001). The discussion questions were:
- Was your higher education option obvious, or did you search available options?
- Who and what influenced your college search?
- Explain your use of the Internet while searching colleges.
- How does the Internet assist students in the college search? What information are you looking for on a college’s Web site?
- Prior to making a decision to visit a college, would you search the college’s Web site? Why, and what information would you seek?
- What are the most meaningful data on a college’s Web site?
- What are the least meaningful data on a college’s Web site?
- What other data would you like to see on a college’s Web site?
- Do you think colleges use their Web sites effectively to communicate with students?
- Do you think colleges should use a standard Web format or show the uniqueness of their departments?

RESULTS

The salient findings are discussed as they relate to Hossler and Gallagher’s (1987) three-stage model of college choice. Specifically, the results addressed stage two, search. Search involved students’ exploration of various college options and gathering of information about each college’s characteristics. The researcher bracketed research participants’ responses in order to reveal how college Web sites affect the search process. Students’ responses suggest that students rely heavily on the information presented on a college’s Web site (to the degree that sites have the power to encourage or discourage prospective students from retaining or eliminating a college as a choice).

Research participants acknowledged that although they visited a college Web site before choosing a college, friends were more persuasive in the search and choice stage when they were seniors in high school. However, once research participants became more familiar with “important” college characteristics, the first search tool they used was a college’s Web site. Participants in this study either changed colleges during their sophomore or junior year or regretted that they did not consider additional colleges upon graduating from high school. One participant said, “My college search was heavily influenced by my friends. Despite being Internet savvy back in 2002, as a recent high school grad, I had no idea that I could have used the Internet to search so many available options.” Another participant echoed this sentiment: “Although my parents did research
colleges and had formed some preferences of their own of which college I should attend, I really took into account where my friends were planning to attend." Following in the footsteps of a high school friend had a negative fall-out on one research participant when her friend changed her mind at the last minute. "Sadly, friends influenced my college search," she said. "I was excited to attend the University of Alabama with my friend, because I could relate to the college and there was a sense of comfort knowing my friend was going too. During the summer, she decided against going to the University of Alabama—so I, too, decided against it. I did not want to room with someone I did not know."

SEARCH

Research participants discussed several reasons they had searched colleges as well as "influencers" that affected their college search. The most-discussed reason for searching colleges was to learn about different options, particularly those that best fit the student's needs (e.g., major). One participant, using a common phrase, said, "I didn't want to put all my eggs in one basket." Several participants remembered that high school friends played an integral part in their college search and choice. Although parents ranked high (along with friends) as the most influential factor on college search, friends were the deciding factor. "When I was a senior in high school, I couldn't bear to think about going off to an unfamiliar place and having to make new friends all over again," said one research participant. Other influencers on college search included siblings, tuition, majors, location, scholarships and financial aid, and social life.

THE INTERNET AND A COLLEGE'S WEB SITE

"The Internet supplies a wealth of information in one location at any time. There is no need to call and visit different campuses to get information, nor is an appointment necessary—the information is available 24 hours a day, 7 days a week, 365 days per year!" exclaimed a research participant. Overwhelmingly, participants in this study emphasized the benefits of using the Internet to search colleges. According to research participants, the college search begins with a general Internet key word search which ultimately takes the prospective (and/or current) student to a requested college Web site. The most sought-after information is majors and tuition followed by ranking, size, and location. In addition, participants described their need for information relating to student population (e.g., diversity and cultures), athletics, social life/student organizations, financial aid/scholarships, housing (on and off campus), college demographics, and the surrounding city. Participants further noted the importance of "real" pictures on a college's Web site. One participant had this to say about a college's Web site: "They [sic] had pictures, but they were so vague and taken at weird angles." Another commented, "I swear I saw the same student picture on one college Web site as I did on another site. Get real!" Yet another said, "I explored so many college Web sites, but after being at three schools, it is easy to see that the pictures you see on a Web site are definitely like advertisements." One participant explained, "It is the college's Web site which the student first sees [in order to] obtain an impression about the college. College Web sites allow students to quickly compare different aspects of colleges in order to make a well-informed decision."

Study data revealed that all but one research participant used the Internet and colleges' Web sites to search and gather information. The reason the one participant did not use the Internet and/or college Web sites had to do with his family's business: "I did not use the Internet whatsoever. My family owns a business, so I wanted to be close to my family and the business. I picked a college in my city. Well, I guess, I did check their Web site for one thing—the course schedule for my major."

Whether research participants were searching colleges in or out of state, they used the Internet and/or college Web sites (to varying degrees) to gather information. They noted convenience and speed as major benefits. Further, they compared a college's Web site to a visual aid, which they deemed as another benefit. One participant who was seeking an athletic program said,

For the colleges that had bad Web sites, I almost immediately put them to the bottom of the pile. It was something I now realize was subconscious. I viewed their Web sites as a reflection of the university. The Web sites that were very good allowed me to go on virtual tours of the school, dorms, and fields. The most impressive one was from the school I almost attended, Columbus State—Georgia. It was very easy to navigate my way around, and it offered virtual tours of the campus,
dorms, and the field (which was beautiful). On top of that they offered live Web casts of the games, which would be very convenient for my friends and family to follow me.

INFORMATION ON COLLEGE WEB SITES

Research participants most wanted information about majors and tuition. “This data is the most important, because if the college does not have my major or I cannot afford to attend the college, then what is the point in continuing my search at that specific college?” said one research participant. Another said, “For me, since cost was such a deciding factor, I felt tuition information was crucial because I didn’t want to sink further into debt.” One participant commented on the importance of information about majors on a college’s Web site: “I believe for me and many other students [sic] they want to see majors listed on a college’s Web site. There is no sense in visiting a college that only offers business courses when you want to be a nurse.”

College Web sites that feature virtual tours ranked high. “I believe the most meaningful data on a college’s Web site is the virtual tour option. For students who are not able to tour the school, this tool is a lifesaver and a time saver. It lets you know exactly what the campus is all about without having to actually be there,” explained a research participant. Another said, “Videos, virtual tours, and other visual aids that can be performed on a computer are important. I have always been a visual learner, so seeing a video would make me want to get more information about the college and possibly pay a visit.” Another important piece of information is student life and a calendar of events. One participant explained, “Although the ultimate goal of attending college is higher education, there still needs to be some fun. With the amount of time spent in class and studying outside of class, there needed to be some places I could hang on campus and activities that would help me unwind.”

All research participants acknowledged that there is no such thing as “least” meaningful information on a college’s Web site, because each student has his/her own specific needs. Nevertheless, in answer to the question posed by the researcher, participants believed that information about the chancellor and the search option were least meaningful. One student declared, “As a prospective and even current student, I really don’t care about what the chancellor is doing at the school. He is like the principal in middle school: nobody really wants to see him.” In regard to the search option, one research participant explained, “My least meaningful data is the search engine on a college’s Web site. Search engines are designed to be the user-friendliest Web site available to prospective and, possibly, current students involved in the search process. But for me, they are horrible. I can never find anything on a college’s Web site using the search engine, and if it frustrates me, then it must frustrate others, too.”

Research participants suggested one additional piece of data that would be beneficial to a college’s Web site: student message boards or blogs. I would like to see an integrated message board type of thing where prospective and current students can chat about various topics or ask questions of one another. Having a public message board along with several different forum areas, one for prospective students only and one for current students, would be a nice way to allow students to connect with one another rather than just try to rely on Facebook.

Another participant said, “I think college Web sites should offer a message board and blogs written by real students about real life experiences at the college. Rather than the sugar-coated Web site, this would offer true insights to life at a particular college.”

Several participants commented on why they prefer “real” student remarks over one-quote testimonials with a picture.

There is one piece of information that I do not see on college Web sites but feel would be really useful and informative, and that is honest reviews. This means real reviews from real students and possibly professors, not just seeing fluffed testimonials that are sometimes displayed. Show something more reminiscent of the type of reviews found on such Web sites as www.ratemyprofessors.com.

Similarly, another participant said, “I would like to see information about the actual students attending the college and how the college has specifically helped them. It would be nice to hear some personal stories about their experience while attending the college. Comments and personal views about the college from businesses and professionals would
be nice, too.” Yet another participant elaborated: “I think it would be a good idea to show students and have them tell how and where they got their job after graduation—also, what kind of position they received with their degree.”

**COLLEGE WEB SITE COMMUNICATION AND DESIGN**

Undergraduate research participants concurred that their college’s Web site was an effective communication tool. Nevertheless, a distinction needed to be made between two important communication tools used by most colleges. Research participants thought their college communicated effectively because of course management software (CMS) called BlackBoard, not because of the college’s Web site. That is, participants rated their institution’s Web site as efficient because of CMS. “Blackboard is great. I love it, because it keeps me up-to-date in all of my classes, even if I miss a few classes. I can see what assignments are due and when. I also really like when professors post important information and changes weekly.” Another participant explained, “I prefer the technological contact that has been available. It’s also great that students can connect with other classmates via e-mail and BlackBoard. It is very helpful, particularly when it comes to addressing questions on new assignments or getting notes from a class you missed.” Still another participant described the benefit of having a campus e-mail account: “Almost all news and information I receive is through my school e-mail account.”

Despite students’ comments, their positive view was the result of CMS, not the college Web site per se. Interactive dialogue is critical. In regard to college Web sites apart from CMS, research participants believe they lack a sense of connectedness to and understanding of how students are using the Internet today. “Colleges should jump on the bandwagon and create MySpace Web sites that are more relaxed and personal portals into the ‘personality’ of the college.” Personality is the adjective many participants used in answering the researcher’s last discussion question.

Research participants stated that college Web sites should adhere to a standard format to alleviate confusion among those navigating the sites. “I think they should use a standard format for the whole college, because it could get a little confusing,” said one research participant. “However, once in a specific department, a standard format should also be used while incorporating the uniqueness of the department.” Another commented, “If I am looking at the art department via a link from the college’s home page, then the Web site should have student displays of art and visually attracting images. I don’t want a business feeling Web site in the art department, because this would not be speaking to my needs.”

**SUMMARY**

College Web sites affect college search to the degree that they either encourage or discourage prospective students’ college choice. Given that today’s students are technologically savvy and “plugged in,” the Internet and college Web sites are bound to be influential in the college search process. College recruitment officers who understand the power of two-way communication must work to ensure that their institutions rise above the “noise” of other higher learning institutions by demonstrating to students that they understand their needs and wants; that is, they must speak the same language. According to Moss, Gun and Heller (2006), “…the appeal of Web sites can be maximized if they mirror the needs and interests of their targeted population” (328). Two-way communication empowers students to become part of the socially created process of searching and ultimately choosing a college. Once a college is selected, two-way communication can support student persistence by helping students to feel connected to the brand (i.e., the college).

College seekers surf college Web sites because they provide information conveniently and quickly. The most sought-after information on a college’s Web site is major and tuition, followed by ranking, size, and location. Other information deemed important by college seekers pertains to student population, athletics, social life/student organizations, financial aid/scholarships, housing on and off campus, college demographics, and the surrounding city. The current study suggests that college seekers value pictures and videos. That said, they prefer “authentic” pictures of students in which any accompanying voiceover resonates with college seekers’ own questions. They also value virtual tours. Although most college Web sites do not yet feature them, student message boards or blogs are highly sought after by prospective college students. Research participants believe that such forms of communication are particularly trustworthy.

College seekers are intensive users of Internet sites such as ratemyprofessor.com and student message boards such
as Facebook. Increasingly, colleges will find they must maintain an effective presence in the virtual community if they are to recruit and retain students. After all, this is how—and where—students are communicating with one another, and it is how—and where—colleges must communicate with students. Colleges must embrace a dialogue with students; such dialogue will prove their best means of recruitment.

REFERENCES


Enrollment management is critical to the success of colleges and universities. Unfortunately, enrollment management is a difficult task because of the complex set of interrelated questions that needs to be addressed. This article presents many of these questions and explains the process of using dimensional data modeling to design an information system that can provide answers. This article also presents a logical model capable of addressing core issues in enrollment management and explains how to extend it.
Enrollment management is central to the success of a college or university. A school must enroll students into courses, completion of a series of which will lead to graduation. While all colleges and universities must manage the enrollment process at least operationally, it is challenging to keep track of all the related data that would allow for managing the process more strategically.

Recent advances in business intelligence tools can help address the complex topic of enrollment management. Among the most promising advances are software for building dimensional data structures (often referred to as OLAP [On-Line Analytical Processing] cubes) and user-friendly tools for analyzing these structures. Progress in adopting these tools, however, has been slow because enrollment management raises questions that are difficult to organize in a dimensional schema.

In this paper we propose a general framework for applying dimensional modeling to a set of enrollment management questions that are common to many colleges and universities. We begin with an articulation of some standard enrollment management questions grouped by focus. We then use these questions to build a dimensional model around a small set of fact tables. After explaining how the model is derived from these questions, we show how the model can be extended to address related subject areas or questions unique to a particular school.

This paper confines itself to a logical model; implementation of the model depends on many factors, including performance considerations and technology choices.

**Typical Questions**

A large number of questions arise in the process of developing, evaluating, and implementing an enrollment management strategy. Although it is beyond the scope of this paper to attempt an exhaustive list of such questions, we nevertheless present—with reference to publications from AACRAO (Westman 2005) and input from participants in the Higher Education Consortium BI/Dashboard group—a list of questions common to a number of different institutions. These questions, organized by subject area, provide the basis for our dimensional data model.

**Admissions**

One of the biggest issues in enrollment management is that of attracting students to the school. For colleges pursuing enrollment plans that target a certain number, academic quality, or diversity of students, it is crucial to have an appropriate admissions strategy and the ability to monitor that strategy’s performance. And it is not only selective colleges that must closely monitor admissions data; colleges with open admission policies also must monitor the number of expected students in order to ensure that instructional resources are sufficient to meet demand.

Some common admissions questions are:

- How many inquiries/prospects do we have by program, college, and student class level?
- How many applicants do we have this year, by program, college, and student class level?
- What percentage of prospects applies? How does this number vary by program, class level, age, gender, race, zip code, and method of contact?
What percentage of applicants is admitted, by program, class level, age, gender, race, zip code, high school, GPA, and test scores?
How many admitted applicants accept an offer of admission, by program, class level, age, gender, race, zip code, high school, GPA, test scores, financial aid offer, and financial need?
What is the average high school GPA and/or class rank of applicants? Of admitted students? Of enrolled students?
What is the average SAT/ACT score of incoming undergraduate students? Of admitted applicants? For graduate school applicants, what is the average GRE/LSAT/MCAT/…?
How many applicants do we expect will become new students this year?

Retention and Graduation
Most colleges and universities are less interested in registering students into individual courses than they are in graduating students who complete particular academic programs. Once a group of students is admitted, its retention and graduation patterns can provide an institution with important information about how successfully it is achieving its academic goals.

Some common questions in this area include:
- What percentage of new students completes the first term and returns for the second?
- What percentage of new undergraduates completes a full credit load in the first term? In the first year?
- What is the first-year to second-year retention rate?
- What percentage of students completes the second year and returns for the third?
- What percentage of students entering in a given program graduates in that program? What percent graduates in a different program or major?
- How many students dropped out of a given program this year? What percent transferred to another program or left the college entirely?
- How many students have graduated from a given program each year over the past five years?
- What percentage of students graduates on time (usually two- or four-year rates)?
- What percentage graduates within 150 percent of “on time?”
- What percentage of students ever graduates?
- What is the average number of credits taken by successful graduates?
- What characteristics most distinguish graduates from non-graduates?

Course Section Management
In most colleges, the basic unit of education provided to students is enrollment in a particular course section. Schools must provide the appropriate educational resources to run their scheduled course sections. Schools also must attract sufficient numbers of students to make scheduled course sections economically viable. Managing course section enrollment is essential to supporting the academic progress of students and the economic efficiency of schools.

Some common questions in this area include:
- How many total credit hours of enrollment are there for each course section? For all course sections of a given course, department, course level, or term? How do these numbers compare to past terms?
- How many course sections and course section seats were offered for a given course? By a department at a given course level? Total? How do these numbers compare to past terms?
- What percentage of course section seats was filled? How does this vary by course, department, course level, faculty member, time, and location?
- What percentage of students withdrew from a course section during the term? How does this vary by course, department, course level, faculty member, time, and location?

Tuition Revenue
When students pay tuition, whether they pay per course, per credit hour, or a flat rate for a term, they are purchasing education. Tuition revenue is used to offset instructional costs. Displaying the intersection of tuition revenue and instructional costs is extremely useful for strategic enrollment management.

Some common questions in this area include:
- What is the total tuition revenue generated per term? By department, school/college, and academic level?
- What is the ratio of tuition revenue to faculty cost by course section, course, department, or academic unit?
After deducting institutional grants, how much does the average student pay per credit hour? By academic level, department, or program?

**Faculty Management**

Faculty members are the primary providers of the education that students purchase. Faculty salary also is one of the biggest variable costs in providing course sections; consequently, it is particularly useful to track how much it costs to staff a given course section with a given faculty member. In addition to teaching, faculty members also are paid for other work, such as administration and research; this makes cost calculations even more complex.

Some common questions in this area include:
- How many faculty members does the institution have? By department? By academic rank? By demographic characteristics?
- What percentage of the faculty is tenured? On a tenure track? By department? By demographic characteristics?
- What percentage of the faculty is employed full time?
- What are the base salaries of contracted faculty members?
- What are the course section pay rates for adjunct faculty?
- What is the cost to have a given faculty member teach?
- What is the average number of course sections, students, and credit hours being taught by full-time faculty members? By department? By academic rank?
- What is the average number of students in each course taught by a given faculty member?
- What is the percentage of students that drops out of a given faculty member’s class?
- How many courses does a given faculty member teach in an academic year? In a particular term?
- What is the overall ratio of students to faculty? By department and program?

**Classroom Management**

Classroom space limits the number of course sections a higher education institution can offer. Because revenue depends on enrollment in available course sections, and because course sections often require a physical location, it is important for institutions to maximize their use of classroom space. Classroom management involves determining the most efficient use of classrooms to meet course section demands. To be most effective, schools must be aware both of unmet course section demand created by classroom shortages and of the inefficiency of underutilized classroom space.

Some common questions in this area include:
- Is our school at capacity? By time slot?
- Which buildings are closest to being used at full capacity?
- Which classroom types are closest to being fully scheduled? Are they utilized by courses that require the specific features of that classroom type? How many courses scheduled in technology-enhanced rooms are using the technology?
- How many more courses of a given type should be scheduled to meet demand?
- What percentage of maximum classroom capacity is being used by actual enrollment?

**Total Enrollment Tracking**

While it is important to track students by individual course sections, it also is important to track the size and composition of the student population as a whole. Most higher education institutions track enrollment by term, so the model we present in this paper is term-based.

Some common questions in this area include:
- What is our total undergraduate, graduate, and professional enrollment? How does it vary over time?
- What is our enrollment by major and by department?
- What is the demographic composition of our student population?
- How many full-time and part-time students do we enroll? By major, department, and academic level?
- What are the biggest departments by number of majors?
- How many new students enrolled this term? This year? By major, department, and academic level?
- How many students returned this term? This year? By major, department, and academic level?

**Financial Aid**

To achieve enrollment objectives and to make it possible for students with limited financial resources to complete degree programs, many colleges and universities award fi-
nancial aid. Knowing how admitted applicants respond to financial aid packages gives schools the opportunity to use aid strategically to achieve enrollment objectives. Knowing how aid affects student retention and graduation also helps schools evaluate whether the aid is sufficient to support student success. Finally, monitoring the distribution of institutional grant aid (also known as “discounting”) ensures that schools have accurate information regarding the net tuition revenue received from students. A degree program that is populated with students receiving no discount will generate more net tuition revenue than a similarly sized degree program populated with students receiving substantial institutional grants.

Some common questions in this area include:
- What is the average discount rate for all students; for new students; for students in a particular program; or for students with certain characteristics?
- How much did the average discount rate of undergraduates change from last year? Of graduate students? By program and major?
- What is the average financial need of our students? How has that changed over time?
- How does the yield of admitted applicants vary by financial need? By unmet financial need? By institutional grant amount?
- What was the average unmet financial need after financial aid?

FACTS AND CATEGORIES

With so many interrelated questions, we need a unified approach that can improve the consistency of reporting and increase the efficiency of our data management and allow us to explore interdependencies. By relying on analysis rather than trusting untested assumptions, schools can implement better strategies for enrollment management.

A dimensional model achieves this result by collecting numeric measures in one or more fact tables and linking these measures to the various characteristics of the event generating the fact(s) by linking to a set of dimension tables. Facts are numbers that can be added and averaged for analysis. Dimension attributes are used to group facts so that sums and averages for groups are meaningful. For the sake of clarity, this paper ends table names with “...Fact” for fact tables and “...Dim” for dimension tables.

For example, a student registered in a course section has facts such as credit hours attempted, credit hours earned, gross tuition, and net tuition; these might be placed in a CourseSectionFact table. All of the characteristics of the student would be stored on a student dimension table while all the course section characteristics would be stored on a course section dimension table. Analyzing the questions listed above, it is possible to create two dimensional models which can encompass the full complexity of enrollment management.

Admissions

In the area of admissions, the central facts appear to be counts of applicants and counts of what happens to those applicants. Those counts are divided further according to the personal characteristics of the applicants and the programs to which they apply.

To address the level of detail in the gathered questions, our model stores facts at the level of one potential applicant to one program for one term in StudentProgramCareerFact. Our facts for this record reflect the achievement of each stage of the admissions process, e.g., applied, was admitted, etc. We represent this as a set of boolean variables set to “1” when the individual has reached a particular stage, such as “admitted,” or “0” if the applicant has not yet reached that stage. We also store as a fact the date when a student attains a stage of the admissions process.

Our logical model (see Figure 1, on page 37) treats information about the individual as attributes on a PersonDim table. To address questions at the program level, we added a ProgramDim table which allowed us to group applicants by program and to sum individual facts to get counts by program. Additional questions require grouping these facts based on application characteristics, such as the department or college to which the applicant is seeking admittance and the applicant’s financial aid status. In order to accommodate these characteristics, we needed additional dimension tables, such as ApplicationDim and FinancialAidAppDim.

Retention and Graduation Rates

Examination of questions in the area of retention and graduation rates suggested that we needed to stay at the level of tracking individual student progress through programs. We simply extended the first model to include additional
boolean and date facts: returning the second term, returning the second year, graduation date, and graduating from the program and/or college to which they initially gained admittance.

Course Section Management

When we examined questions about course section management, we found that our initial fact table was no longer suited to the facts we needed to track. We still wanted to address questions at the student/program/term level, but we also were interested in facts about students enrolled in course sections. Thus, our focus shifted from a longitudinal view of a student’s career to a cross-sectional view of a student’s enrollment behavior in a particular academic term (see Figure 2, on page 38). For these questions, StudentCourseSectionFact contains one record for each student registration in a particular course section; facts include the number of credits attempted, the number of credits earned, and whether the student withdrew from the course section.

In order to fully address the questions in this section, however, it proved insufficient to simply add up the student enrollment facts. We therefore added CourseSectionFact, which contains information about the course section (such as section, room capacity, and faculty member) and is linked to StudentCourseSectionFact via a CourseSectionKey.

Tuition Revenue

Questions concerning tuition revenue proved a particular challenge. We wanted to monitor tuition revenue in a flexible manner, which would have been relatively easy if we had associated tuition as a fact of each student’s course section enrollment; yet many programs charge a flat tuition rate per term rather than per course or per credit. To calculate tuition revenue, we therefore needed a StudentTermFact table that included the total term tuition along with the total credits attempted. With the addition of this table, calculating per-credit tuition became a simple matter of division.
The advantage of this approach became evident when we saw that in addition to face-value tuition, there were common questions about net tuition after institutional grants were deducted. The StudentTermFact table became a place to track total term institutional grant aid.

Whether this approach works for any given institution depends on exactly how tuition (and other instructional revenue sources, such as course fees or government-provided instructional funding) relate to the fact of a student being enrolled in a particular course and/or for a parti-

**FIGURE 2. Cross-Sectional Enrollment Management Logical Model**

*NOTE:* In this model, StudentKey and FacultyKey are synonyms for PersonKey.
lar term in a particular program. In moving from logical model to implementation, this issue will need to be carefully resolved by each individual institution.

**Faculty Management**

FacultyTermFact contains faculty salary and teaching load data for the term. These facts allow us to calculate instructional cost at the course-section level by calculating the percentage of the total instructional load represented by the section and then multiplying that by the term teaching salary.

FacultyDim contains information about each faculty member, such as department, rank, and full- or part-time status. These characteristics may change from term to term, so each record of this table is defined at the faculty-member-per-term level of granularity.

**Classroom Management**

In addressing questions related to classroom management, we saw the value of constructing a comprehensive model. All we needed to add to our existing model were a room dimension connected to the CourseSectionFact table and a room capacity fact on that table.

**Total Enrollment and Financial Aid**

Questions relating to total enrollment and financial aid did not require us to significantly alter our model. Data already in StudentCourseSectionFact and StudentTermFact can be summed to determine aggregate enrollment and grant aid. However, these questions involve some term-dependent aspects of a student’s relationship with the school, such as new or continuing status, so we added a StudentTermDim table to hold these attributes. Financial aid questions require a number of additional facts about students; these facts were added to the StudentTermFact table. The model likely will need to be extended at each institution by including in the StudentTermFact table other aid measures of interest.

**EXTENDING OR MODIFYING THE MODEL**

Flexibility is one of the many advantages of the model presented in this paper. Many schools will look at this model and recognize that it does not address a critical enrollment management issue on their campus. However, as long as students pursue completion of academic programs longitudinally and enroll in course sections within terms, it is likely that the model can be modified to account for local concerns. For example, if an institution is focused on academic performance as measured by grade point average, the model can be modified to include grade information. If two facts, GPA_Points and GPA_Credits, are added to the StudentCourseSectionFact table, the formula GPA = Sum(GPA_Points)/Sum(GPA_Credits) can be applied to any collection of course section grades. The same formula can be used to calculate average grades given in a course section; to compare average grades of students by personal characteristics; and to compare the average grades given by academic departments.

Suppose a particular institution wants to evaluate a group of programs—such as natural science programs—collectively. It could add an element to the ProgramDim table, label it something like ProgramCategory, and proceed with analysis of that grouping.

A slightly more difficult modification could be made to analyze the impact of various interventions on retention and graduation. The desired information could be tracked by adding an InterventionDim table to the longitudinal model, connecting it to the StudentProgramCareerFact table with a new InterventionKey, and then adding fields to describe participation in the various interventions being evaluated.

When attempting to obtain new functionality, it often is faster and easier to modify an existing model than to create a new one. Even in cases where it might be faster to build a new model, there are advantages to extending the existing model. Because of the number of interrelated factors available, existing facts and dimensions will support flexible analysis, leading to deeper understanding of critical issues.

**ANALYSIS ACROSS THE MODELS**

Some questions may require investigation of the interaction between the longitudinal and cross-sectional models. For example, an institution may want to know if poor performance in particular courses results in students’ leaving a particular program or even the school. The sharing of dimensions between these two models makes it possible to develop new data structures to perform such analysis. The PersonDim, ProgramDim, and TermDim tables make it easy to identify the first-term courses taken by new students in any program. To analyze the retention impact of students’ performance in a particular course, the analyst
would need to add measures of performance such as EnrolledInProgramSecondYear and GraduatedInProgram to the StudentProgramCareerFact table.

IMPLEMENTING THE MODEL

Modifying the model to address all of the enrollment management issues at a particular institution likely will lead to a significantly more complex model than that presented in this paper. Nevertheless, the process of examining key questions and developing a logical model to address them is both informative and useful. Developing a full logical model does not necessitate full implementation. Implementations can be staged.

Seeing the full model in advance enables design and implementation of system modules that eventually will work well together. Knowing that admissions questions are logically related to questions of retention and graduation could lead to the inclusion of dimensions and dimension attributes that will prove extremely useful when the time comes for retention and graduation analysis. If the logical model is developed using a tool such as Microsoft SQL Server Analysis Services or Microsoft Visio, the modeling process can transition seamlessly from explaining the logical model to providing documentation for technical staff. With such a tool, staff can begin building a physical implementation of the model with confidence that the design has been clearly specified. Documenting the metadata as the model is implemented becomes a straightforward process, resulting in a system that is easier to maintain, explain, and extend.

When implementing a dimensional data system for enrollment management, it is important to remember that tools available to users usually show only a partial view of the entire database. A partial view is convenient because the hiding of unnecessary fields lessens confusion for beginning users. However, as users become more advanced and/or as it becomes necessary to include additional information for purposes of analysis, it is easier to take that information into account if it already is in the database.

Moreover, the challenges of data extraction, transformation, and loading (ETL) into the dimensional data mart
can be substantial. By developing the logical model first, the ETL process can be measured against a clearly defined information objective, and the impact of data limitations can be readily understood in terms of the questions being addressed. It might be a poor decision to restrict the logical model simply because it is difficult to implement given currently available data and development resources. Also, it is not unusual for the process of developing an ETL strategy to expose additional data that address unanticipated questions and provide real value, requiring extension of the logical model.

DATA DEFINITIONS
Moving from the logical model to implementation of the physical model will require precise definition of each data element. Even common terms such as “applicant,” “new student,” and “aid” are subject to different interpretations by different users. The term “freshman” may refer to any undergraduate who hasn’t yet reached sophomore standing, or it may refer to the entering cohort of new, first-time, full-time undergraduates. These distinct student statuses need both to be tracked differently in the database and to be given distinct labels in all reports; only then can confusion be avoided.

To support benchmarking against other institutions, it may be worth using definitions from a standards body such as the Integrated Post-secondary Educational Data System (IPEDS) or the common data set (CDS). Unfortunately, standards probably won’t address all data elements needed for enrollment management. Use standards when they are available; clearly document how each data element is defined; give data elements unambiguous names; and educate users as to data definitions.

CONCLUSION
Because of the large number of related questions raised in the course of developing and implementing an enrollment strategy, the process of developing a comprehensive data model can be daunting. However, it is precisely because of this complexity that a systematic approach to supporting enrollment management analysis and reporting is worthwhile. Making informed decisions in this area frequently calls for answering a series of questions about the likely impact of changing one aspect of the system. A dimensional data mart that accounts for these overlapping relationships in a carefully designed logical model lowers the cost of exploring these questions, yielding more informed conversations and more successful decisions.

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This article focuses on the interaction between students and institutions as they move toward decisions related to college attendance. Enrollment managers will find this information useful as they work within their institution to develop and revise long-term recruiting strategies that benefit both the institution and future students. Typically, research on this topic has focused on either the college choice process made by students or the enrollment management practices of institutions. Typically, each implies the participation of the other group. Yet few research studies have specifically examined how each directly affects the other (McDonough 1994). Thus, I propose a model that attempts to explicitly represent how the interaction of these two processes—college predisposition, search, and choice. Each stage involves specific activities that move the student forward in the process, back in the process, or out of the process.

Predisposition
During the predisposition stage, students develop a preference regarding future college attendance. This consideration process may begin in early childhood (Bouse et al. 1991; DesJardins et al. 1999; Hearn 1984; Johnson and Stewart 1991; Kelpe Kern 2000; Urbanski 2000). By the time students enter ninth or tenth grade, they usually have already identified their future educational goals (Hossler and Gallagher 1987; Hossler et al. 1999). On the basis of their predisposition, students are classified into three
groups: those who are definitely planning to attend college and who now are focused on which college to attend; those who are yet undecided regarding college attendance; and those who are planning not to attend college. Research consistently shows that parental influence seems to have the greatest impact on a student's classification as he or she moves from the predisposition to the search stage of the process (Bers and Galowich 2002; Conklin and Daily 1981; Hossler and Gallagher 1987; Hossler and Maple 1993).

Search
Some time during high school, students move into the second phase of the decision-making process: search (Hossler and Gallagher 1987). This is a time when students who have already decided to attend college begin to actively seek information that will help them choose a specific college. Students who are still undecided regarding college attendance use information gathered during this phase to inform both their decision to attend college and which specific college to attend if they pursue that path. As described below, the search phase corresponds to the active recruiting phase of the enrollment management process: students seek information and schools try to provide it (Hossler and Gallagher 1987; Paulsen 1990).

Choice
As admission deadlines approach, students enter the last phase of this model: choice (Hossler et al. 1999; Johnson et al. 1991). During this phase, students apply to a finite number of colleges and then select one to attend. While researchers may assume that students make logical and rational decisions regarding their final college choice, those involved in the practical business of recruitment and retention are well aware of the emotional and seemingly irrational processes that determine the final outcome. College choice is a complicated decision and students enter this process as extremely young adults without any previous experience in decision making of this magnitude and type. As one college student said, “Many of us choose our four years of mind expansion on the basis of how well a college fits the mental narrowness we possessed in high school” (Dixon and Martin 1991, p. 31).

ENROLLMENT MANAGEMENT
College choice views the matching of student and school from the student’s perspective; enrollment management is the view from the institution’s perspective. While students are trying to choose a college, colleges are trying to choose and enroll students. The institution’s objective is to have the desired group of students actually matriculate. Enrollment management typically has not been a topic of scholarly research; rather, it is a practical applications issue. Authors
such as Bontrager (2004a, 2004b) describe its concepts, structure, and implementation strategies. However few have actually tested it, put it in a larger theoretical framework, or developed models about it. Those studies that have attempted to accomplish these goals primarily occur in dissertations (Black 2003; Brown 2002; Kruse 1996).

After reviewing the types of activities typically involved in enrollment management (Black 2003; Bontrager 2004a; Bontrager 2004b; Hossler and Bean 1990; Huddleston 2000), I am proposing a three-part model of the enrollment management process that includes three categories: plan, communicate, and select (Adams 2006).

Plan
During this stage institutions are “establishing clear goals for the number and types of students needed to fulfill the institutional mission” (Bontrager 2004a, p. 12). These goals are established in part through the collection and analysis of relevant data pertaining to prospective students, applicants, matriculants, and current students. In addition to defining this optimum enrollment mix, enrollment managers plan and develop the policies, procedures, and strategies that will enable them to achieve their enrollment goals.

Communicate
Once the target students have been identified, institutions seek to proactively identify, inform, and recruit these students to the institution. During this stage we typically speak of either marketing or recruiting activities. However, in the larger perspective, institutions are attempting to communicate and inform specific students about the institution and what it offers. Using business concepts, institutions identify applicable market segments—that is, groups of students who are likely to attend the school. They then develop different communication strategies—recruiting activities and events—for each of these groups.

Select
As students apply to the institution, admissions officials carefully screen the applications and admit eligible students. Because the ultimate goal is matriculation, institutions will continue to engage in communication activities after students have been admitted in order to increase the likelihood that these admitted students will choose to enroll at the institution (Huddleston 2000).

Enrollment Choice
The enrollment management model both parallels and is intertwined with the college choice process. Thus both models have been incorporated into one larger model that provides a framework for college matriculation and attendance. Each year, both processes culminate in joint matriculation decisions. As implied in the figure, predisposition, search, choice, plan, communicate, and select constitute only the first half of the larger Enrollment Choice Model. Once new students are admitted and enroll, decisions and issues of persistence—that is, re-enrollment in future semesters—become important factors that lead ultimately to the desired goal of graduation. This article focuses only on the top half of the model.

Predisposition/Plan
At some point prior to making an enrollment decision, students develop a predisposition toward college attendance. Those who decide they will attend college are typically influenced by people in their immediate surroundings: family, friends, and other individuals who impress upon them the positive rewards and benefits of higher education. Similarly, at some point prior to students’ enrollment decision, institutions plan and prepare for the size and composition of this particular incoming collegiate cohort. The institution’s plans are also influenced by its immediate surroundings: estimates and expectations regarding the number and credentials of future students, as well as available resources (i.e., faculty, classrooms, housing, etc.) required to educate those students.

During the predisposition/planning stage, students and institutions typically have little direct or intentional contact with each other (Hossler and Gallager 1987; Urbanski 2000). Institutions do not necessarily share their estimates or expectations with potential students; neither do students necessarily share their concerns or questions with institutions. Nevertheless, students and institutions may have indirect or unintentional impacts upon each other, or upon the other individuals who influence the decision-making process of either the student or the institution. For example, students may acquire information about an institution from parents, older siblings, or other relatives who attended it. Thus, others’ impressions may influence the prospective student’s general predisposition not only toward college attendance but also toward attendance at a particular school.
As indicated Figure 1, the line between plan and predisposition implies that institutions can have an impact on students’ future college attendance when these two stages are brought into alignment. For example, Hemsley-Brown (1999) found that institutions begin communicating with students during their junior and senior years of high school—long after students have created filters regarding college attendance, appropriate types of schools to attend, and their own abilities and aptitudes for higher education. Pre-high school students who are knowledgeable of, and interact with, institutions of higher education may be more likely to decide to attend college and to develop the decision-making skills required to make an appropriate college choice. Because parents shape their children’s future educational aspirations, institutions might also communicate with the parents of pre-high school students (Pope and Fermin 2003). Bers and Galowich (2002) suggest that schools should provide these parents with information about financial aid, admission requirements, the application process, and college in general as many families—particularly those without any previous college attendees—may be unfamiliar with the specialized terminology, requirements, and processes associated with higher education. The more information students and parents have at an earlier stage, the better they can plan and prepare for the college choice process.

While communication activities during the predisposition stage are more likely to increase prospective students’ college attendance, they may not ensure attendance at a particular college (Hossler and Maple 1993). Thus, many institutions may not view activities during the predisposition stage as an effective use of resources. However, continued, long-term positive exposure to an institution fosters productive long-term relationships between students and institution. Students who perceive a connection with an institution are more likely to select that institution; and the earlier institutions begin to develop these relationships, the more time they will have to educate students about the institution. In contrast, those institutions that attempt to gain a student’s attention during the chaotic and overwhelming search and/or choice stages will have a much lesser opportunity to communicate their message or to ensure that students adequately evaluate their information—assuming it is even “heard.”

Institutions can do a number of things to promote college awareness among pre-high school students. For example, they might send faculty, graduate students, and undergraduate students as “guest speakers” for grade-appropriate discussions, presentations, and events in K–8 classrooms. They might host a research/learning day at the institution and invite pre-high school students from several schools to visit the campus and participate in grade-appropriate activities within the classroom and campus setting. Many schools already sponsor such activities as part of federally funded Science Technology Engineering and Math (STEM) programs. These same strategies also apply to the social sciences, fine arts, and humanities.

Institutions might form consortia comprising schools and other educational governing agencies. Members could work together to promote college awareness and preparation. Schools or consortia could educate pre-high school students and their parents as to general factors that need to be considered when students reach the search and choice stages and as to the information-processing skills required to make such a decision. For example, many parents may be aware only of the financial cost of higher education and of the need to prepare early to meet that
cost. Higher education institutions and consortia could also provide information on such things as the difference between a private liberal arts college and a public research university, or how higher education is structured and delivered as compared to K–12 education. In short, colleges and universities could begin to make the culture of higher education more understandable and transparent to those who are not yet part of it (parents and pre-high school students) and to those whose tax dollars (in the case of public institutions) support it. When they are convinced of its value, parents will actively encourage their children to pursue higher education. Many schools have already initiated programs that provide information to the parents of future first-generation college students. It may be beneficial to provide this information to all parents as a way either to develop or to reinforce an understanding of the value of higher education.

Those institutions that include these types of predisposition-based activities in their enrollment management strategies will reap additional benefits from these early contacts with students and parents. Paulsen (1990) suggests that enrollment managers use data from the predisposition stage to identify students with characteristics comparable to those who will eventually attend the target school. Institutions can then track and interact with these students, starting early to build one-on-one relationships with students they want at their institution. In addition, interacting with pre-high school students will alert institutions to changing trends in the way students respond to the educational process. Thus, institutions can plan to implement technological or curricular changes students are likely to seek when they matriculate.

Search/Communicate

Direct and intentional interaction between students and institutions typically begins when students are in high school. Those students who are actively searching for a college to attend begin to request information from specific
colleges. Likewise, colleges are providing information to those students who have expressed a predisposition toward future college attendance. During this stage of the Enrollment Choice Model, students—despite limited information and experience—narrow a search that contains almost infinite possibilities. Their goal is to identify a group of colleges to which they will apply. Institutions, on the other hand, operate from a much larger information base and an entrenched understanding of higher education. They typically develop recruiting practices that attempt to sell the specific benefits and qualities of their institution. The institution’s goal is to have desired students apply, and, ultimately, enroll.

While students and institutions are aware of the relative position and goals of the other, neither tacitly addresses these differences in goals, power, and information. Thus, students are prone to provide the information they think institutions want to hear while diminishing or concealing their true educational aspirations. Institutions, eager to recruit desired students, often forget or fail to ask questions that would elicit more accurate responses from students. In addition, students who have a more limited understanding of higher education or who are not interested in specific content they receive, may misperceive the information provided by the institution.

During the search/communication stage, institutions will continue to build upon the relationships and image they fostered during the predisposition/plan phase. The goal is to maintain positive relationships with students targeted during the predisposition stage and to encourage students who meet the target demographics to include the institution on their choice list. Institutions accomplish these objectives by providing students with focused, frequent, and content-specific information that maintains and enhances the student’s connection to—and impression of—the institution.

During the search/communication stage, information provided to students focuses more on institutional specifics, although general information about higher education is still provided to those students who entered the college choice process late. The institution will also want to develop questioning and listening strategies that allow it to better understand each student’s specific needs and concerns; to provide each student with content-relevant information; and to move beyond unstated assumptions, miscommunications, and superficial explanations.

By actively listening, understanding, and addressing each student’s goals, needs, and concerns, institutions will be able to provide students with more accurate information about the potential fit between the student and the institution. Choosing to sell students on the greatness of the institution may yield a higher application and matriculation rate, however failing to ensure that the advantages the institution offers are actually desired by the student may not support long-term retention-graduation strategies (the as-yet unstudied lower portion of the Enrollment Choice Model in the figure). As Bontrager (2004b) notes, the primary purpose of recruiting communication “is to determine student-institution fit, that is, the degree to which a student’s academic preparation, educational goals, career aspirations, and personal preferences are in line with what an institution has to offer” (p. 9). If the fit between the two does not match, then future retention and graduation problems may arise (DesJardins et al. 1999; Paulsen 1990).

Choice/Select

Once students have identified the colleges to which they will apply, they move into the choice phase of this process. They apply to a finite number of schools and wait for admission decisions. At this time institutions move into the selection phase of this process. Using admission and selection criteria established during the planning process, institutions admit certain students. When students receive these admission decisions, they must make the final choice of which school, if any, they will attend. The choice/selection process is extremely interactive: Students cannot matriculate unless they are admitted; institutions cannot admit students unless students apply. During this phase, institution and student rely upon the decisions of the other as they move toward matriculation agreement.

The direct and intentional communication that may have started during the student’s search process continues and changes as institutions attempt to influence the matriculation decisions of those they have accepted. While the student’s search decisions were complex—creating a finite list from infinite possibilities—the choice decision—selecting one school from a list of similar schools—may prove
even more difficult. (Of course, for those students with only one offer of admission, this choice may be easier.)

For those students with multiple options, it is imperative that the institution continue to practice the questioning and listening skills previously described. This is the time when the institution must directly satisfy the information needs of the student if the student is to matriculate. Further, the institution must understand that every un-dotted i or un-crossed t becomes a reason for the student to exclude the institution from consideration, thus narrowing the choice process and making it more manageable. While institutions must cater to students’ needs during this process, they retain the ability to determine the “fit” of each particular student to the institution, in terms of both the immediate matriculation decision and long-term retention-graduation decisions.

**CONCLUSION**

The Enrollment Choice Model presented in this article connects the enrollment management process of institutions with the college choice process of students. It describes how institutions and students interact with one another as they seek to arrive at a mutually agreeable decision; and how the behaviors, communication, and decisions of one affect the behavior, communication, and decisions of the other. Those involved in the enrollment management process may want to use this model as they continue to develop and revise their strategic recruiting policies and procedures based upon the interactive realities and possibilities of these two processes.

By initiating communication during the predisposition/plan stage, institutions create four distinct opportunities. First, they help to increase the size of future applicant pools by encouraging more students to consider and prepare for college selection and attendance. Second, they encourage students to connect to, and to become a part of, the institution’s community just as we hope that alumni will remain connected to and a part of the community after they have graduated. Thus, a foundation for a long-term relationship between student and institution is established. Third, institutions are able to identify and track specific students desired by the institution. Such demographic tracking allows institutions to focus on the needs of specific students while also planning for future trends in applicant pools and class sizes. Finally, information gathered during the predisposition/plan stage will help institutions prepare for administrative needs such as more buildings or classrooms, for curricular modifications such as those related to students’ expectation and use of new technologies in the classroom, their expectations regarding how information is communicated along with how and where learning occurs.

During the search/communicate stage, institutions modify their communication strategies in order to provide more specific information. By increasing the frequency of their interactions with students, they are able to manage students’ impressions and awareness of the institution. Focused interactions allow the institution to understand each student’s specific needs and to respond accordingly. Data collected during this stage provide institutions with information relevant to short-term management goals such as the expected size of the freshman class and the potential need for more introductory courses.

During the choice/select stage, institutions maintain or increase their interaction with students, particularly those who have been accepted. As many institutions have discovered, failure to maintain communication with students who have verbally agreed to attend the institution but who have not yet signed on the dotted line may alienate those students and cause them to choose a different school. As decision deadlines approach, those institutions that have worked with students through all three stages of the enrollment choice process will be in a better position to inform and guide students through the final step. In addition, those students will be better prepared to evaluate and analyze the information they receive.

The Enrollment Choice Model is beneficial to those institutions actively involved in the enrollment management process. It is also useful to those involved in research of both the college choice and enrollment management processes. It provides enrollment managers and researchers with new ways to develop programming and to frame research questions that recognize the interdependence of institutions and students in matriculation decisions. Finally, through consideration of the as-yet undeveloped lower half of the model, it provides researchers and enrollment management professionals with new possibilities for exploring and planning the full academic continuum, from recruitment through retention to graduation.
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AMELIA ADAMS is an Assistant Professor at the University of Oklahoma, where she teaches administrative leadership courses in the College of Liberal Studies. Her dissertation explores the decision-making strategies of high school students admitted to a variety of colleges. This article is based on that work.
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Beginning in the late 1990s, international corporations began hiring Chief Privacy Officers (CPOs). By 2002, large universities responded to this trend by creating this distinct position or modifying an existing job description to include CPO responsibilities. While not every registrar assumes the role of CPO, increasing practical and legislative requirements make it necessary for colleges to respond in a coordinated fashion to identity management, information vulnerabilities, and data breaches. It seems inevitable that registrars will interact with someone assuming the role of CPO.

Although it is an important first step, appointment of a Chief Privacy Officer does not guarantee that constituents’ private data will never be exposed. Who could anticipate, for example, that because a professor selected the wrong file, student grades would be uploaded to the public Web site; or that a financial aid administrator’s laptop would be stolen? Instead, CPOs respond to vulnerabilities to constituent privacy by translating best practices and constantly changing external regulations in a uniform manner that fits the institution’s need and circumstance.

Registrars have been filling this function for years (making us potential candidates for this role, at least in small colleges, and with the support of General Counsel). Instead of campus offices attempting individualized responses to FERPA, the registrar provides a unity of leadership, knowledge, and credibility in coordinating the institution’s compliance and training and its response to various threats. Where a registrar demonstrates an expected level of expertise with regard to FERPA and the privacy of education records, a CPO’s responsibility extends to the variety of records, threats, information-sharing practices, and federal and state regulations applicable to the entire institution.

This is a tremendous responsibility given the staggering amount of data that colleges and universities maintain. Registrars certainly are familiar with sensitive information lurking in the academic record. But consider the extensive data maintained by other offices:

- Financial information about students and their parents, including financial aid applications, income tax returns, employment history, salary, work schedules, loans, bursar accounts, records of purchases charged to campus accounts, and insurance claims;
- Health information collected by campus health centers, athletic programs, and campus-provided insurance services regarding students, employees, and their families;
- Broad financial and other personal information relating to employees’ payroll, insurance, benefits, retirement, research accounts, travel reimbursements, and vehicles;
Student, faculty, and staff e-mail (sent or received), centrally stored and/or accessed documents, backup files, Internet-browsing records, telecommunications and Internet use patterns, voicemail, and billing records;

- Location information on students, faculty, and staff as they swipe parking passes and magnetic key cards (or use passwords or biometric identification devices) in dorm rooms, dining rooms, and offices and as they log on to wireless Internet nodes;

- Videotapes and files from the increasingly ubiquitous security cameras installed in libraries, parking lots, office buildings, dorms, campus stores, cashiers’ offices, athletic facilities, and hundreds of other locations on campus;

- The titles of all books and articles checked out of the library, accessed via electronic reserves, bought at the campus bookstore, and paid for using institutional charge or debit cards;

- Extensive financial and other data on alumni and donor prospects, including their assets, salaries, past gifts, employment records, achievements, family members, wills, and bequests;

- Health, financial, and/or behavioral data on patients treated at college/university hospitals, clients served at student legal services and law school clinics, subjects chosen for research studies, and children cared for in campus day-care centers;

- Data pertaining to vehicles that access and park on campus, even temporarily;

- Data accessed from external sources for background checks, references, debt collection, litigation, and other uses (e.g., institutions increasingly are using sources like Facebook.com to monitor students’ online activity) (Cate 2006).

Threats to constituent privacy exist at both large and small institutions. Larger colleges and universities have a higher profile and greater quantity of data—a veritable gold mine for criminals and the dangerously curious—but also are likely to have greater resources dedicated to implementing safeguards and privacy standards. Information maintained at smaller institutions poses many of the same threats to constituent privacy; in reality, however, these institutions often lack dedicated resources. This leaves surprisingly few faithful employees in already resource-stretched offices to do the best they can. Smaller colleges thus are ideal targets for the nefariously minded.

Educational Security Incidents, a Web site maintained by Adam Dodge, is a repository of data exposures. According to the 2007 Educational Security Incidents Year in Review, at least 1.2 million records were exposed as the result of employee fraud, impersonation, loss, penetration, theft, and other disclosures. By mid 2008, an incredible 2.4 million records had been exposed (Dodge 2008). (Many more unquantifiable records were recorded for both the 2007 and 2008 summaries.) The negative financial and reputational implications suffered by both institution and consumer (should the information be misused) are overwhelming.

AACRAO also is doing its part to alert constituents to the continuing need for the development of privacy stan-
dards and practices. Since November 2007, SecureU has disseminated the most pertinent cyber and campus security issues each month in an online publication. (You can subscribe to SecureU from AACRAO's home page.)

Yet, these Web sites reveal that the majority of incidents reported to date have not been overseas hackers penetrating institutional firewalls or exploiting operating system vulnerabilities (though this does happen); rather, stolen laptops, accidental posting of private information on public Web sites, and data exposed as the result of absentmindedness have led privacy officers to agree with Pogo: “We have met the enemy and he is us” (Kelley 1972).

Providing effective privacy leadership at a college or university begins with credibility earned not only from experience and education but also from a demonstrated commitment to the institution’s values as well as the ability to work with the campus’s broad array of personality types. Credibility is imbued tentatively and eventually is either affirmed or rejected on the basis of perceptions at the conclusion of the privacy leader’s ‘honeymoon’ period. The effective leader sustains credibility through relationships built on trust and mutual respect.

Trust and privacy protection are intertwined issues that the privacy leader must balance intentionally. On the one hand, the CPO’s role is to guide the institution through the assessment of privacy vulnerabilities; this requires an auditor’s acuity and integrity. On the other hand, the CPO is not the de facto leader and policy maker of all offices and so must intentionally communicate both the collegial partnership that exists among involved parties and the complementary nature of all roles in achieving the institution’s goals.

As with any leadership initiative, creating and sustaining momentum to achieve a desired degree of change is very much an art that involves the translation of circumstances into definable and achievable action items. National policy makers regularly utilize momentum to achieve their policy goals. To cite a recent example, President Obama’s Chief of Staff Rahm Emanuel stated, “You never want a serious crisis to go to waste.... Things that we had postponed for too long, that were long-term, are now immediate and must be dealt with. This crisis provides the opportunity for us to do things that you could not do before” (Seib 2008). Emanuel continued by describing how current crises in a range of policy items create the need for immediate and broad action.

Items short of crises (which should be avoided despite Emanuel’s enthusiasm for them) present themselves regularly and can be used to identify and highlight potential privacy vulnerabilities. When law enforcement arrives with a subpoena, how are requests for information properly vetted to ensure compliance with applicable law? When employees leave, how does the institution ensure that privileged access is removed in an appropriate amount of time? The new recycling bins are great for the planet, but is consideration given to how data dropped in the bins is protected?

Making the case for continued or increased attention to constituent privacy should not be difficult in light of the number of privacy incidents reported regularly. When robust resistance is encountered, however, CPOs should be certain to have executive-level support. The Chronicle of Higher Education reported that Lauren B. Steinfeld’s hiring as the chief privacy officer at the University of Pennsylvania “did not sit well with everyone.... There was a lot of passive-aggressive response to this position.” That criticism “came from within the university as well as nationally” (Guerney 2008). Because the work of protecting constituent information involves the entire institution, executive support is critical to the success of the privacy leader.

Once executive support has been obtained, the CPO’s primary task is authentic compliance with federal and state laws and regulations. While the avoidance of fines and other penalties should be motivation enough, these standards provide a process by which an institution can assess and minimize threats to constituent privacy. While creating a policy for inclusion in a manual may act as evidence to external stakeholders, the real value of this primary task is contingent upon the authentic nature of the compliance process.

For example, the Gramm-Leach-Bliley Act (also known as the Financial Services Modernization Act) enacted in 1999 requires financial institutions (including college and universities) to designate an individual responsible for compliance with the Act; to train employees; to assess risks to constituent data; to implement necessary safeguards; and to prepare for the management of system failures. Authentic compliance with these requirements will aid the institution in reviewing its practices and procedures and in fact may decrease the risk to constituents. Privacy protection is not the highest priority (after all, it’s
not in the mission statement), but the value of the process is that it heightens the attention given to privacy protection; provides evidence of due diligence; and aids in the avoidance of breaches that might significantly interrupt the primary work of the institution.

The process for and challenges in assessing privacy risks vary among institutions. At small colleges, the multiple roles an individual plays may require access to multiple areas of data—access typically limited by specialty at larger institutions. At some institutions, the work of privacy officers may be less about the dictating of procedures than about guiding divisions and larger offices through their own assessment, educating about best practices and applicable requirements, providing recommendations, and acting as a resource when questions arise. The privacy leader partners with disparate parts of the institution to help them work toward harmonious ends.

The assessment process can threaten the sense of community in tight-knit offices and small colleges. After all, the rationale for limiting or even removing access to non-essential private information is that people are bad or prone to accidents; often, the need for privacy policy is accepted until the implementation of such policy becomes a personal reality. In these instances, the role of the privacy officer is to educate employees about the primary benefit of having less access to data—namely, the best way to eliminate suspicion or guilt regarding the mishandling and abuse of data is not to have access to such data in the first place.

Ensuring constituent privacy is important because we want to demonstrate to families, legislators, corporations, and external partners that we are worthy of their trust. Institutional privacy failures contradict the essential nature of such relationships. While the protection of privacy is the responsibility of everyone in the institution, leadership determines whether a coordinated effort to ensure authentic compliance and to minimize constituent risks will succeed or fail. Effective privacy leaders gain executive support, translate opportunities into action items, ensure authentic compliance, and anticipate organization-specific challenges.

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The Strategic Academic Enterprise:
Why ERPs Will No Longer Be Adequate

By Mary Jones

In the 1970s and ’80s, manufacturing firms began purchasing centralized administrative software—“Enterprise Resource Planning (ERP) systems”—to support their infrastructure needs. In the 1990s, higher education adopted the term ERP to define the back-office systems used by institutions to meet their most pressing business needs—typically those related to financials, human resources, and student information. Over the years, however, institutions have struggled with a variety of issues outside the scope of what a traditional ERP system can manage, from effectively connecting with the community to successfully marketing the campus vision and spirit, to offering a teaching and learning experience that aligns with the institutional mission. These issues, as well as a host of others, have rendered the concept of ERP inadequate for meeting the business and academic needs of higher education institutions.

Three dramatic trends are occurring in the higher education industry. Individually, these trends are nothing that institutions haven’t faced before; in fact, many institutions have adapted accordingly and have continued to be successful. However, these trends have converged, causing a dramatic shift in the way higher education institutions operate and strive to fulfill their vision of student success.

These trends can be identified as the need to serve multiple generations; a shift in teaching and learning standards; and the ever-present yet escalating issue of affordability.

SERVING MULTIPLE GENERATIONS AT THE SAME TIME
Imagine an incoming freshman class that includes your 17-year-old daughter, your 40-year-old brother, your mother, and your grandfather. Possible? More than ever before, multiple generations are interacting with colleges and universities at the same time—as students and as parents. And the members of each generation—Baby Boomer, Generation X, and Millennial—learn differently and seek unique services from an institution.

In order to meet the varying needs of these emerging students, parents, employees, and communities, institutions will need to offer several different ways for its students to accomplish the same task. Everything will be affected, from enrollment, registration, curriculum, and housing to financial aid, safety, facilities, and more.

Who are they?
Shaped by current events, each generation is drastically different from the others.

- Baby Boomers: Born between 1943 and 1960, Baby Boomers grew up during the post–World War II era of optimism. They witnessed the Cold War, the space
race, the Civil Rights movement, the Vietnam War, the “summer of love,” and much more; all of these shaped their beliefs and values. They are the first generation that grew up with television, which broadcast the same programs, news, and laughs across the nation. It has been said that boomers helped transform the current educational system (Howe and Strauss 2007).

Generation X: This is the MTV generation, born between 1961 and 1981. Widely criticized as slackers, they opted out of traditional careers and “jumped” from company to company, climbing the corporate ladder faster than any previous generation. This generation grew up with the Internet, latchkeys, AIDS, the fall of the Berlin Wall, and the collapse of the Soviet Union. Gen Xers are independent and hands-off, yet some have become our greatest entrepreneurs.

Millennials: The ubiquitous “Baby on Board” sign was a true indication that the minivan was safely transporting a Millennial (also referred to as Generation Y). Born to Baby Boomers and Generation X parents, this generation grew up during the most child-centric time in our nation’s history; its members have great self-confidence. Technology has always played a significant role in their lives and has had profound effects on how they communicate and learn. In general, Millennials are team-oriented multi-taskers who follow and prefer structure and rules. “They are more numerous, more affluent, better educated, and more ethnically diverse than those who came before.”

How will they affect campus services?

Approximately 90 million Millennials expect to use technology for almost everything, from finding an institution on the Web to collaborating with their classmates (Howe and Strauss 2007). This is nothing new. But add to the mix the Baby Boomers and Gen Xers who are returning to the classroom in record numbers. The U.S. Department of Education reports that as of 2005, nearly 420,000 adults over the age of 50 were enrolled as college students (Wegerer 2008). And this number is increasing each year.

Baby boomers are not afraid of technology, but institutions must have personal services available immediately or this generation will move on to another opportunity (Wegerer 2008). The independent Gen Xers undoubtedly will want to use technology for registration and even for classes, but the moment they don’t like the service or the offering, they are gone without a word.

Higher education institutions will need both to balance technology and personal face-to-face services and to be flexible enough to adapt quickly, depending on the customer.

Curriculum also should change to meet the needs of the newest students. According to the popular YouTube video, “Shift Happens,” the top 10 jobs anticipated in 2010 didn’t exist in 2004. Former Secretary of Education Richard Riley reported that this trend will continue. In other words, today’s students need to be preparing for jobs that don’t yet exist—jobs that will be needed to solve problems we don’t yet know about (Fisch and McLeod 2007).

Some Baby Boomers and Gen Xers are returning to complete a bachelor’s degree after having taken time to raise a family. Others are seeking a new career path or want to earn a master’s or Ph.D. Most Boomers have a strong desire to help their communities. Many are changing careers before they retire in order to help the poor, children, and the elderly. They are taking courses online and are physically attending classes in order to learn new skills.

How can institutions prepare students for jobs that don’t yet exist? In addition to offering the right curriculum to help students reach their goals, higher education institutions will need to more effectively market their business courses to demonstrate how acquired knowledge and skills can be used to help the local community.

Parent Factor

Not only are institutions managing three unique generations of students, but — more than ever before — they also are interacting with them as parents. While Baby Boomer parents have been referred to as “helicopter parents,” Generation X parents are ten times more involved and so could be referred to as “stealth-fighters” (Howe and Strauss 166). Gone are the days when parents dropped their children off in the fall, not to be heard from until they picked up their children for Thanksgiving break. Extensive parental involvement has become the norm as parents e-mail, call, and even demand meetings with professors about their children’s progress (or lack thereof). “FERPA be damned” they seem to say as they demand to see their children’s
grades. Some parents even accompany their children to registration. And most students want their parents to be involved. Such parents need services to help them keep in close contact with their children and to keep them informed of their children’s progress.

**TEACHING AND LEARNING PARADIGMS NEED TO SHIFT**

We have entered a new era of teaching and learning—one characterized by a shift from knowledge-based learning to a new world of “search.” The ready availability and vast quantity of information on the Internet has enabled today’s students to learn differently from those who preceeded them. They no longer need to memorize world capitals; instead, they can google them.

Students today do not need to be “taught to the test” by being required to memorize facts. Instead, students want to learn through action, application, contact, and real-life scenarios. Institutions need to be ready to support this new kind of teaching and learning. Coupled with their knowledge and use of technology, students collaborative and multi-tasking nature demands new ways of teaching. More than simply offering online courses, institutions must review departmental pedagogy to ensure that it continues to meet the needs of all students.

According to “Learners 2.0? IT and 21st Century Learners in Higher Education,” a recent research paper by Educause Center for Applied Research (ECAR), the traditional stand-and-deliver lecture format style of teaching will not be adequate to help students develop the necessary skills to succeed. The paper went on to suggest that learning needs to shift toward being student centered and technology enhanced in order to engage students (Moore et al. 2008).

To accommodate a new kind of learning, institutions also need to adjust how they view students: Rather than seeing students as passive receivers of information and unengaged learners, educators need to treat them as “big-picture thinkers and critically engaged doers” (Moore et al. 2008). Professors need to bring students into the process, even to the point of relying on students’ technology and Internet expertise.

Professor Michael Wesch of Kansas State University collaborated with 200 of his students to create a video called “A Vision of Students Today” (2007). The video summarizes how students want to learn today. Not only does it provide an insightful view of students, but students themselves created this video as part of the class. In a presentation to nearly 150 higher education executives at Datatel’s 2008 CIO Executive Forum, Dr. Wesch explained how his class created its own countries and democracy, an exercise that required independent thinking and teamwork to solve problems.

To accommodate the learning styles of today’s students, professors will need to adapt their courses and use effective tools for better collaboration.

**AFFORDABLE EDUCATION IN THE 21ST CENTURY**

As always, economics plays a role in change. More than ever before, colleges and universities need to compete, offering better curriculum at better prices. There is no doubt: We are in a credit crisis that is affecting students’ ability to secure the funding necessary for their education, and institutions across the country are feeling the effects. With dwindling subsidies, how will higher education close the gap between tuition fees and the rising cost of education? Can students and families afford more tuition increases?

State funds, private donations, and earnings from endowments traditionally bridge the gap between tuition and the final cost to the institution. But those subsidies are rapidly decreasing as government, market, and household priorities shift.

For more than ten years, the percentage increase in the cost of higher education has outpaced increases in the cost of housing, transportation, and even health care. Some private colleges will charge more for one year’s tuition than the nation’s median family income of $50,000 (Chronicle of Higher Education 2008). More and more families will apply for financial aid, and record numbers of students will graduate with significantly increased debt. Already, in 2007, students carried 63 percent more debt than those who graduated in 1993, even after adjusting for inflation (Blumenstyk 2008).

The answer (at least according to the Chronicle and several institutional leaders) is productivity: offer a better educational experience at a better price.

To meet this challenge and the many others that confront it, higher education will need to dramatically transform and perhaps fundamentally change the way it does business. To compete successfully in this new environment, institutions will need to merge academics and ad-
ministration in order to provide more strategic services. The traditional ERP is not sufficient to support this new business model.

**WHY WON'T THE ERP BE ADEQUATE?**

Gartner, Inc., defines an ERP system as administrative software comprising at least three components (e.g., human resources, financials, and student information) that are loosely or tightly coupled. Although the following capabilities are not requirements for inclusion in Gartner’s Magic Quadrant, they are important to higher education and thus are often included in requests for proposals and quotations:

- Grants management, with both pre-award and post-award tracking and management
- Advancement, including fundraising, corporate giving, and alumni management
- Facilities scheduling
- Enterprise portals
- Research management
- Relationship-based enrollment management

However, this list does not adequately represent all of the areas and functions that require attention if an institution is to remain competitive and agile in the current market.

The higher education industry needs to go beyond the traditional back-office ERP system and adopt strategies and solutions that cross the entire campus, blending the academic and administrative enterprises.

**BEYOND THE ERP: THE STRATEGIC ACADEMIC ENTERPRISE**

Strategic Academic Enterprise represents the evolution of ERP. A strategic, holistic solution, Strategic Academic Enterprise addresses the complete business and academic needs of an institution, providing a campus-wide experience of enhanced user satisfaction, increased productivity, and greater institutional effectiveness.

Rather than artificially separating back-office technology from front-office academics, the Strategic Academic Enterprise positions institutions to achieve the ultimate goal of student success and satisfaction. Strategic Academic Enterprise consists of five interrelated business process domains: Strategic Enrollment Management, Performance and Operational Management, Teaching and Learning, Institutional Advancement and Marketing, and Strategic Planning.

**Strategic Enrollment Management** (SEM) encompasses the entire student cycle, from prospective students to alumni. A crucial goal of SEM is continued growth, attained by coordinating efforts in areas such as marketing, student recruitment and retention, tuition pricing, financial aid, academic and career counseling, curriculum reform, community building, and donor solicitation.

When viewed from beginning to end, an institution’s relationship with a student makes the importance of great customer service readily apparent. This means offering a balance of online services with personal, face-to-face care.

Recruiting needs to begin at an institution’s Web site, where relevant information that is important to the prospective student as well as to the parent is provided. The Web site should reflect the institution’s spirit and brand, and it should be easy to navigate; critical information such as that relating to financial aid and the application process should be front and center.

The more personal an institution’s communications with a prospective student, the faster the student and her parents will know if the school is the right fit. Today’s parents and students doubtless will choose a higher education institution together; so it’s critical to include parents in the marketing mix. Some institutions may choose to target parents separately, providing specific messages that are of particular importance to them; such messages may focus on finances, campus and student safety, and career path success and/or post-graduation employment rates.

Outstanding customer service should continue beyond recruitment. A strong retention plan will keep students and parents happy. For example, online registration needs to be easy to use and intuitive, and personal assistance should be readily available for those who find Web services complicated or difficult to use or access.

No matter how tech-savvy students are, they still want personal attention. Some will find it difficult to maneuver through the intricacies of college; institutions need to be prepared to advise students should they start to falter. Ideally, an institution will have the ability to monitor and track student behavior so administrators can intervene as needed in order to help students succeed. Many institutions’ advising plans consist of a combination of one-on-one planning sessions in addition to online capabilities;
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this satisfies the needs of tech-savvy Millennials, independent Gen Xers, and returning Baby Boomers alike.

It is critical for institutions to review their services to ensure that they meet the needs of these three very distinct generations. Doing so will increase the likelihood that they will reap a high return on investment.

Institutional Advancement and Marketing foster emotional ties to the institution through coordinated outreach to all constituents, including alumni, parents, community members, and the media. During the present economic crisis, it is important to continue to build new relationships and to strengthen existing relationships with alumni, donors, and the community. As the gap between tuition and administrative costs increases, institutions will need to look increasingly toward alumni and friends for support. However, many institutions already are seeing a significant decrease in donations and endowments (largely the result of the volatile market), making it imperative to develop a tight-knit alumni community to help weather the economic storm.

Having the right tools to help improve efficiencies and increase productivity will be critical to the institutional bottom line. Institutions should be able to track fundraising communications and campaigns from their beginnings in order both to monitor progress toward goals and to adjust if necessary. When a step or task is complete, communications management functionality should be such that the next message is sent automatically on the basis of where in the communication stream the person is. Such automation will increase the amount of time staff can devote to helping students directly.

Fostering emotional ties to the institution may prove difficult given the ways in which the three generations tend to respond to marketing. Although the members of each generation will react to different messages and marketing vehicles, an institution’s brand must remain consistent.

The first place to solidify marketing is where potential students—regardless of age—start their search: Google. Ideally, institutions should think about the attributes they hope a prospective student or parent will type into Google—words that will result in their institution being at the top of the search list. Those key words should be used on the institution’s Web site and on other marketing materials. It is imperative that the institution’s Web site accurately reflect the culture and spirit of the institution—for students, parents, alumni, donors, friends, and the media. Visitors to the Web site should be able to visualize that they belong on the campus.

Beyond the Web site is a wealth of new and exciting marketing vehicles for promoting the attributes of an institution: beyond direct mail and e-mail are text messaging, YouTube, SecondLife, campus visit videos, FaceBook, blogs, LinkedIn, and more. The mix of vehicles an institution chooses to utilize truly depends on the audience it seeks to reach. For example, each generation is likely to react differently to a text message: Baby Boomers would not appreciate it; Gen Xers might feel their privacy is being violated. Yet Millennials—if asked to opt in to such a service—might prefer to learn by text whether they have been accepted for admission. To increase the success of its marketing efforts, an institution should ensure that each generation is provided appropriate messages and communication vehicles.

Another important concept to consider is the purchasing habits of these generations. Millennials make purchases not only with parental consent but also with their forthright help and support (Howe and Strauss 2007). Baby Boomers and Gen Xers alike assess brand value, if in a slightly different manner. In the past, institutions’ raising of tuition—at least in the eyes of Baby Boomers—represented an increase in brand value. Today, Gen Xers—as parents and as students, along with their children—will seek proof of an institution’s value through the curriculum and the technology used to enhance it. More important, they will want verification that the education they and/or their children receive will help them get a job after graduation (Howe and Strauss 2007).

Strengthening the alumni community and institutional marketing efforts by communicating a consistent, strong message will appeal to the audience and differentiate the institution.

Teaching and Learning are at the heart of every institution’s vision and mission. Today’s students demand technology that supports teaching and learning. Online classes may bring together information, but how effective are they in bringing together students? Technology must be used to help students collaborate and work together in teams, as well as to create and strengthen communities.

Close examination of Facebook, MySpace, and other online communities will help institutions develop strategies
not only for recreating that type of social environment on campus but also for transferring that vibrant energy to the classroom, whether online or in person. Students spend significant time updating their profiles on Facebook—more than 1,200 in a year (Wesch 2008). Institutions can enhance teaching and learning by emulating the constant interaction and sharing found in these online communities.

Technology is not the only enhancement to teaching and learning. Helicopter parents and, now, “stealth fighters” are asking how institutions will help their children get jobs. The bigger question, however, is “What job will that be?” Because institutions are training students for jobs that do not yet exist, they need to go beyond teaching students how to solve problems to helping them develop “problem-posing capabilities” (Moore et al. 2008). Members of this generation don’t need to memorize all of Shakespeare’s works; they can google them! Instead, they hunger for practical skills they can apply to any career.

Baby Boomers and Gen Xers want a curriculum that extends further than a master’s or Ph.D. They also demand practical learning that will directly affect their end goals. Baby Boomers in particular want to develop skills that will help them in their next career in the community. Many come from business careers in which collaboration and teamwork are the norm. The stand-and-lecture style class of their alma mater will not be sufficient; they have vast knowledge they want to share with and contribute to the class.

Michael Dolence, President of Michael G. Dolence and Associates, recommends focusing on the learner through the curriculum. “Learner-Centered Curriculum” (Dolence 2009) provides a framework for the identification, design, development, deployment, and evaluation of curriculum based on significant evaluation of learners. Seven interlocking components ensure that the curriculum fulfills institutional and fiduciary missions while concentrating on learners’ attributes, objectives, and needs (Dolence 2009).

The core of any institution is teaching and learning. Today’s students demand not only a technology-enhanced education, but also one that is collaborative, team-oriented, and relevant. The ability to adapt to the needs of different students is critical in today’s competitive higher education marketplace.

Performance and Operational Management include those critical business processes that help institutions optimize their effectiveness. The right administrative of-
An experienced consultant can assist in formulating the optimal strategic plan and in determining which data are required for effective reporting and accurate decision making. As impartial members of the strategic team, outside consultants can unveil tough issues that an institution either may not see or may be choosing to ignore.

According to Donald M. Norris, co-author of *A Guide to Planning for Change* (2008), “Successful leaders use strategies to frame the need for change and to develop their organization’s capacity to prosper in a changing and competitive environment…. In the process of planning and crafting strategy, the institution discovers how it must improve its organizational capacity in order to thrive.”

**STRATEGIC ACADEMIC ENTERPRISE**

By addressing all five business areas together, institutions will be better prepared to face today’s emerging trends and tomorrow’s unique challenges. This new approach, the Strategic Academic Enterprise, is designed to help higher education institutions enhance student life, strengthen communities, and increase employee satisfaction. It helps institutions address the curriculum and service needs of multiple generations of students while remaining priced to compete.

The days of focusing separately on administrative and academic needs are quickly waning. The union of these closely intertwined areas requires new ways of thinking and enhanced solutions. Only then will institutions remain competitive.

**REFERENCES**


**About the Author**

**MARY JONES** has been a marketing professional for nineteen years. For the past eleven years, she has specialized in marketing for technology and professional services organizations for higher education. She has worked with Datatel, Inc. the past seven years and is now the product marketing manager for strategic enrollment management solutions.
Editor’s Note: This is the second in a two-part series of articles by Pikowsky focusing on assessment in the registrar’s office. The first article appeared in College and University Vol. 84, No. 2.

The Office of the Registrar at the Georgia Institute of Technology, in cooperation with the Office of Human Resources, has been engaged since February 2008 in a pilot project to model core competencies for the leadership team and the staff. It is the hope of the Office of Human Resources that this pilot will result in a model that can be used campus-wide to model core competencies in other areas. Ms. Marita Sullivan, in the Office of Human Resources, is our mentor and partner in this process. Her role in this venture has been tremendously important to us.

Although competency modeling can be defined in different ways, it is being described at Georgia Tech as follows:

Competency modeling is the output of researching and identifying the characteristics (or competencies) of workers that underlie successful performance. Identifying and differentiating competencies helps achieve “best” performance and allows for targeted development and training dollars. For this initiative, we are piloting the competency modeling process developed by David Dubois, Ph.D., and William Rothwell, Ph.D., of Strategic Performance Improvement Associates.

The benefits of having competency models in place include providing information to staff and managers that is useful for career development; assisting employees in understanding the behaviors and skills needed to be successful in their current jobs; allowing the office to target training and development activities more precisely and to use scarce budget dollars more effectively; assisting in identifying good candidates for open positions; providing a useful tool for managers to improve staff performance; and facilitating succession planning.

STEP ONE

The first step in modeling the competencies was a meeting held with the managers (assistant and associate registrars and the registrar), facilitated by a staff member from the Office of Human Resources, to model the core competencies for the leadership team. Following a PowerPoint presentation to introduce the theory, the group brainstormed ideas, using sticky notes to track progress. The group then prioritized the suggested competency areas in order to reach agreement on which were the most critical.
Table 1.
Leadership and Staff Competencies, Summary of Individual Work

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<tr>
<td>Well-respected</td>
<td></td>
</tr>
<tr>
<td>Willing to admit</td>
<td></td>
</tr>
<tr>
<td>mistakes</td>
<td></td>
</tr>
<tr>
<td>Willing to serve others</td>
<td></td>
</tr>
<tr>
<td>Work to improve process</td>
<td></td>
</tr>
</tbody>
</table>

The competencies shown in Table 1 (left column) were identified through the leadership team’s brainstorming exercise (members worked individually to identify the areas and collectively to prioritize them).

Table 2, on page 65, defines those competencies the leadership team considered the most critical.

**STEP TWO**

The process of identifying the competencies was completed for the staff. At the meeting with the staff, the registrar facilitated the discussion.

The competencies shown in Table 1 (right column) were identified at this meeting; from this group, the most important were selected for the staff.

Table 3 (on page 66) defines those competencies that staff considered the most critical.

Because staff positions vary both in level and in focus, the registrar and associate registrar suggested the competencies shown in Table 4 (on page 67) be used as appropriate when developing the individual models.

**STEP THREE**

The next step in the process was to develop an assessment tool to use to evaluate individuals against competencies selected as most applicable to their positions. Although the assessment tools vary slightly (due to the fact that positions exist at different levels in the office), there are common threads: communication skills, for example, are important for all positions at all levels; building effective business partnerships is an important competency for all managers.

The assessment tool includes: an area that addresses career interests; six competencies (eight for managers) identified for evaluation; a section where the registrar and the employee rate the six (or eight) areas on a scale from 1 to 5 (5 being the highest) and finally agree on a mutual rating; a section where possible activities are identified; and a sec-
tion where specific activities are listed to target the competency areas.

The employee and the manager completed and signed the assessment forms, having agreed to meet again in three to four months for a progress report. Following are some examples of the kinds of activities that were used to target specific competencies for improvement.

Activities and Competencies Targeted for Managers

- **Activity:** Review other institutions’ transfer credit policies and Web sites and prepare a report of highlights that might be useful to us in redesigning our own Web site and enhancing information about our policies and procedures.
- **Competencies Targeted:** Written communication and subject matter expertise.
- **Activity:** Work with the Web developer to prepare and deliver classes on the use of Excel, Word, and Web software.
- **Competencies Targeted:** Effective utilization of resources (the Web developer is skilled in other areas and could be utilized more effectively if assigned to other projects where he has expertise.)

Activities and Competencies Targeted for Staff

- **Activity:** Choose two academic units to visit and then prepare a “profile” to be discussed with other members of the degree certification team. The better we understand the units we serve, the better we can support them.
- **Competencies Targeted:** Building business partnerships; communication skills; job knowledge.
- **Activity:** Read each issue of “The Successful Registrar” and send a monthly e-mail highlighting the most interesting thing you read or learned.
- **Competencies Targeted:** Job knowledge and communication skills.

Table 2. Leadership Competencies—Office of the Registrar

<table>
<thead>
<tr>
<th>Competency</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communications</td>
<td>Defined in its broadest sense – written and oral communication skills, the ability to be persuasive, public speaking, facilitation, respectful debating/meeting control, listening skills, ability to inform/train, extemporaneous speaking, ability to diffuse emotion and identify avoidance, ability to provide effective feedback</td>
</tr>
<tr>
<td>Subject matter / technical expertise</td>
<td>In-depth knowledge of functional area and solid across-the-board understanding of all functions in the Registrar’s office. Clear understanding of how the Registrar function ‘fits’ in Enrollment Services and at Georgia Tech. Specialized knowledge such as Institute policies, federal regulations, etc.</td>
</tr>
<tr>
<td>Ability to make difficult decisions and deal with difficult situations</td>
<td>Not jumping to conclusions, collecting and thoroughly analyzing all information related to the topic, making informed decisions and considering all options/addressing alternatives, being consistent, effectively managing interpersonal skills to avoid escalation, being courageous</td>
</tr>
<tr>
<td>Team player</td>
<td>Coaching, modeling behavior/leading by example, willing to do what needs to be done/not asking others to do something you would not do yourself, sharing the spotlight and not having to be a solo star, helping with all employees</td>
</tr>
<tr>
<td>Appreciating employees and being approachable</td>
<td>Open to all employees (not just Office of the Registrar), understanding/friendly, open door policy, adopt ground rule: no stupid questions/bad ideas, support/encourage personal growth, reward and recognize</td>
</tr>
<tr>
<td>Effective utilization of resources</td>
<td>Defined in its broadest sense – time, budget, people – making sure right people are doing the right work effectively, supplies, space, tools, targeted personal growth, compensation</td>
</tr>
<tr>
<td>Achieves results</td>
<td>Establishes aggressive goals; demonstrates a clear bias for action. Promotes an action-oriented organization that values speed, accuracy, and tangible results. Takes immediate action on high-priority work without requiring extensive analysis or deliberation. Ensures that commitments are met and outcomes delivered upon with requisite time sensitivity. Plans and implements projects and programs to meet organizational goals.</td>
</tr>
<tr>
<td>Builds business partnerships</td>
<td>Responds to customers’ needs in a manner that provides added value and generates significant customer satisfaction. Acquires and applies professional/technical knowledge, skills, experience, and judgment to accomplish results, serve customers better, and contribute to the organization’s intellectual capital. Ensures integration and cooperation across organizational boundaries. Generates alliances with internal and external partners that enable the registrar’s function to supply appropriate services to its customers. Develops positive relationships by making others feel their concerns and contributions are important. Approaches all relationships in an open, friendly, and ethical manner.</td>
</tr>
</tbody>
</table>
STEP FOUR
The next step was the development of a technical competency model for managers in the office. (This work began in late fall 2008.)

STEP FIVE
The final step of the 2008–09 competency modeling project will be a review of the results in preparation for performance evaluations in March 2009. Once the performance evaluations are completed, 2009–10 competency assessments will be completed. The goal of the competency modeling is to enhance performance in each employee’s current job. A related goal is to better prepare the staff member or manager for promotion.

UNEXPECTED EVENTS
In September 2008, the economy in the state of Georgia took a significant downturn. The result was a budget cut of 6.5 percent to be exacted in January 2009 and a freeze on all non-essential travel. The cut in the Registrar’s Office decimated the operating budget and resulted in the cancellation of all non-essential activities, including professional development.

Table 3.
Staff Competencies—Office of the Registrar

<table>
<thead>
<tr>
<th>Competency</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork</td>
<td>Defined in its broadest sense: non-territorial approach to work and problem solving, being approachable, embracing change, creative thinking, acceptance of others for the unique skills, abilities and perspectives they add to the office, professionalism, dedication to customer service, maintaining a positive attitude, empathy, seeing the big picture, cooperation, selflessness, managing stress effectively, having respect for others, flexibility, having a sense of humor, enthusiasm, knowing the difference between constructive criticism and attacking others, dependability, accountability, patience</td>
</tr>
<tr>
<td>Communication skills</td>
<td>Listening assertively, professionalism, mentoring others and accepting mentoring from others, delivering customer service in such a way that the customer knows that his/her needs are the primary concern, interacting with others in a positive way, networking effectively with colleagues inside and outside the office, being able to speak effectively in public settings, maintaining patience when taking in or delivering information and service, written communication skills, empathy when dealing with others, healthy sense of humor when appropriate, confidence without arrogance, oral skills, transferring knowledge effectively to others</td>
</tr>
<tr>
<td>Problem solving</td>
<td>Using good judgment in indentifying and examining a problem, making sound decisions based on good information, keeping in mind the needs of the customer or the colleague as the problem is solved, following through as necessary to make sure all the loops are closed, not leaving any loose ends, managing conflicts effectively</td>
</tr>
<tr>
<td>Organizational skills</td>
<td>Detail oriented, accurate, managing time effectively to make sure work is completed when needed, maintaining a high level of productivity, following through, documenting processes and work flows, planning ahead to ensure that focus remains on what needs to be done and in what order, remaining focused on the work at hand, and working in the moment</td>
</tr>
<tr>
<td>Job knowledge</td>
<td>Mentoring, transferring knowledge effectively to others, receiving training and applying knowledge effectively, being open to learning and accumulating knowledge, creative thinking, forward thinking, looking to the future, seeing the big picture, exhibiting confidence without appearing arrogant, being consistent in all things, goal-oriented, ambition, wanting to learn more and expand one’s professional horizons, maintaining good documentation for one’s assigned tasks, maintaining current information, effectively incorporating the vision of the office into one’s job performance each day</td>
</tr>
<tr>
<td>Analytical skills</td>
<td>Creative thinking and creative approach to dissecting a problem, issue, or process, ability to break a business process down into logical and manageable pieces so that it can be more easily understood, ability to see what flaws may be in a business process and re-engineer parts or the whole process as necessary, ability to see where a process fails or where it is inefficient, ability to analyze how technology might be used to solve a problem, ability to research a question, issue, or problem to gather pertinent information that would better inform a workable solution, ability to ask good and clear questions</td>
</tr>
<tr>
<td>Use of technology</td>
<td>Ability to access technology and data in performing daily tasks, ability to extract data effectively from different sources and present it in a useful way, ability to use and handle data appropriately, understanding the Banner student module well enough to perform daily tasks and assist in problem solving, understanding Crystal reports, AFACTS, and other tools well enough to assist in performing daily tasks</td>
</tr>
</tbody>
</table>
The competency assessments that included activities that had associated costs had to be replaced with no-cost options. This required some creative thinking. No-cost activities included such things as reading and reporting on books that were already in the office’s library, doing research on the Web and preparing a report, visiting other offices on campus and writing a profile, attending free “brown bag” sessions on campus and keeping a journal, preparing and delivering training materials and classes for staff in the office, attending free classes offered by the Office of Organizational Development, and attending meetings of the Georgia Tech Academic Advisors Network. In other words, we attempted to take advantage of expertise and events that already existed in our office and on campus.

This unexpected part of the exercise was helpful in that it proved we could identify useful activities without adding cost. Creativity thus is an important factor in this process. This also was an important lesson in how important it is to maintain forward and positive motion even in times of stress and uncertainty. Pushing forward with this process proved helpful; abandoning the effort in response to the financial crisis would have sent the wrong message about professional development—that is, that it is tied to the budget and is driven by whether or not funding is available to support it. The wrong message would have been to cancel all related activities, thus proving the adage that professional development is the first thing to abandon when the going gets rough.

**About the Author**

**RETA PIKOWSKY** is the Registrar at the Georgia Institute of Technology. Her 25 years of experience in higher education began at the University of Illinois, Urbana-Champaign, in an academic department. Her current interests include core competency modeling for staff and managers in the registrar’s office, career development for staff in the registrar’s office, and training programs to serve internal and external audiences.

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### Table 4.

**Additional Competencies for Use in Individual Models**

<table>
<thead>
<tr>
<th>Competency</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achieves results</td>
<td>Establishes aggressive goals for completing tasks; supports managers in promoting an action-oriented organization that values speed, accuracy, and tangible results. Takes immediate action on high-priority work without requiring intervention of supervisor. Ensures that commitments are met and outcomes delivered upon with requisite time sensitivity.</td>
</tr>
<tr>
<td>Demonstrates adaptability</td>
<td>Demonstrates flexibility in applying different approaches to changing work demands. Generates innovative ideas and helps to identify areas needing change. Champions new ideas and directions and encourages similar behavior in others.</td>
</tr>
<tr>
<td>Builds business partnerships</td>
<td>Responds to customers’ needs in a manner that provides added value and generates significant customer satisfaction. Acquires and applies professional/technical knowledge, skills, experience, and judgment to accomplish results, serve customers better, and contribute to the organization’s intellectual capital. Generates alliances with internal and external partners that enable the registrar’s function to supply appropriate services to its customers. Develops positive relationships by making others feel that their concerns and contributions are important. Approaches all relationships in an open, friendly, and ethical manner.</td>
</tr>
<tr>
<td>Communicates openly and effectively</td>
<td>Contributes to a team environment where information flows freely and decision making is based on a win-win philosophy. Strives for speed and efficiency in all communications. Is concise and articulate, both orally and in writing, communicating complex ideas and concepts with clarity and simplicity and making every effort to keep involved parties informed. Establishes and promotes two-way communication; shares ideas freely. Listens effectively to others’ input and opinions. Ensures that information can be accessed readily and easily by all concerned. Presents perspectives and opinions in a clear and polite manner.</td>
</tr>
</tbody>
</table>
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More and more often, our campuses are taking an active role in making gay, lesbian, bisexual, and transgender (GLBT) students feel welcome. This has taken a number of forms, from non-discriminatory policies with inclusive language to participation in GLBT college fairs and scholarship programs for GLBT students. The pitfall into which many of us have fallen is grouping the GLBT community into one diversity category but concentrating only on the GLB portion and forgetting about transgender students. As more and more students identify themselves to us as transgender, it is important for us to be prepared at a minimum and, at best, to make them feel as welcome as any other student population.

First, it is important to review some basic definitions. “Transgender” is a broad term that covers a variety of ways in which people express themselves; usually these ways challenge what many of us think of as “typical” gender behaviors. The clearest and most frequent situation is when someone whose gender identity (the gender as which they identify and present themselves) doesn’t match the gender they were assigned at birth. The term ‘transition’ is used to describe the process of switching the living of their lives from one gender to another. Transition may include change in dress, hormone treatment, cosmetic surgery, and/or gender reassignment surgery. Often, it also includes a legal name change and change of legal gender (Mottet and Tanis 2008).

As higher education administrators, we are in an incredibly unique position when it comes to this population. We all take for granted how much of the student experience—and especially the work of registrar and admissions offices—is defined by gender. We have single-sex institutions, scholarships dedicated to women, men’s and women’s sports teams, and dorm assignments based on gender. Our offices report how many male and female students we have recruited, our retention and graduation rates for specific populations (such as African American males), and they frequently play a role in selective service registration for eighteen-year-old males. With so much emphasis on gender, transgender issues become unavoidable.

When we think about why it is important to be sensitive to transgender issues, the answer is the same as for being inclusive of all diversity: Our institutions value the educational experience that is gained by people from different backgrounds and experiences learning together. Our role is to make sure that all of these populations feel comfortable and welcomed at our institutions.

Registrar and admissions offices regularly become the first point of contact for transgender students because their student record is such a significant part of their col-
lege experience. A balancing act for our institutions is to deal appropriately with the record while honoring the confidentiality of the student. In many cases, the student’s classmates, instructors, employers, or future college or university do not know they have transitioned. For example, if someone has transitioned from male to female and has changed her birth certificate and social security information to reflect that she is female, she is, in all legal aspects, female. Our office reporting on a transcript that the student is male not only causes confusion but also could reveal inappropriate information to an employer. Having procedures in place to work with transgender students and alumni can help ensure that we are acting responsibly. This article will provide guidance in a number of areas in which colleges and universities can work to make their campuses more inclusive of transgender students.

CUSTOMER SERVICE

Even before addressing any policy issues, it is important to prepare staff for the inevitable and to have a system in place for when a student identifies either as already having transitioned from one gender to another or as planning to do so. Our offices are some of the first such students approach because of the value of the record information we have and because of how our records are shared (e.g., class rosters, transcripts, financial aid reporting). We hope that our staff are respectful toward and understanding of all of the “customers” with whom we work, but we also acknowledge that that is not always the case. Such simple courtesies as asking, “What name or pronoun do you prefer to be called?” seems common sense but almost never are extended. From the student’s perspective, you not only have been respectful, but you also have conveyed a sense of understanding of the situation. It may be impractical for all of your staff to be sufficiently knowledgeable about transgender issues to handle every situation. Many offices have identified a staff member who serves as the expert on the issue (usually this person is also the expert on record changes in general). Again, saying, “Let me have you talk to staff member X, who works more frequently with

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students who have transitioned” not only will allow your front line staff to hand off the questions but also will show that your office is prepared to respond responsibly.

NAME CHANGES

A name change is the most frequent request we get from transgender students and fortunately is the least difficult of the questions that arise. As with any other name change, transgender students can work through the court systems to legally change their names. Our offices can use the same systems that are in place to change the name on a student record for transgender students as for any other student.

Some issues to consider that are common with all name changes but that are of specific importance to transgender students are historic records, re-issuing documents, access to data, and timing of the record change. When considering how your office deals with name changes on historic records, view the change from the perspective of a student who has transitioned from one gender to another and does not want that information to be shared with his or her employer. When you change the name on a record, does the change revert to all terms for which you have a record for that student? If you have hard copy records (transcripts), do you change the name on the record card? In both cases, the answer for transgender students should be “yes” so that if you produce a transcript, verification of enrollment, or certification of a degree, you will be doing so based on the last name you have on file for that student, with no other names appearing.

Offices also need to decide how they will handle the re-issuing of documents. Most often, this is a question for alumni who have transitioned and who ask for their diploma to be reissued. Again, most of us have a re-issue policy in place for lost or stolen diplomas; but we may not have a policy of re-issuing a new document with a name change. If the student has followed the legal process for a name change, we can satisfy an alumni request by granting a reissue request. In some cases, the transition may be taking place while a student is enrolled or even while he or she is applying to our institution. Knowing that for many young people the admission letter is not just a document but a symbol of their achievements suggests that we need to recognize requests to reissue these documents as well (when appropriate).

Access to student records and FERPA are always a concern for our offices, but how we store data may have significant implications for transgender students. Can name or gender changes in your student system be seen with normal system security? While there needs to be a balance for auditing and verification of archival records, the best system for transgender students allows only limited access to name and gender change information.

GENDER CHANGES

Gender changes, unlike name changes, can place our offices in a difficult position, requiring them to make a series of judgments. Ideally, our offices can treat gender changes like any other information change—very similar, actually, to a name change. In the best of cases, the student was born in a state that has a system in place that changes the gender on the birth certificate. This usually happens in one of two ways: Either the birth certificate is completely re-issued so that only the new gender appears, or an addendum is attached by the state officially recognizing the change. In these cases, the request for a change can be treated as “routinely” as possible. The student can produce the necessary documentation (new birth certificate), and the record change can be made, again following a protocol similar to that for name changes.

However, there are a few major exceptions: Some states do not list the gender on the birth certificate, and others will not change or amend the birth certificate. First, consider those states that do not record gender on birth certificates. While this can seem like a blessing for someone transitioning, it can create an artificial barrier: if a school has created a gender change policy that is reliant on a notation on a birth certificate to change a student’s gender in the system, there is no easy solution when gender is not noted. A few states (Ohio, Tennessee, and Idaho) do not allow a change or amendment to the gender on a birth certificate. In all of these cases, the college or university has to create its own system to deal with the issue. Often, this poses more of a philosophical than a logistical challenge for us as professionals. That is, as keepers of official records, we are challenged by the idea of changing a record with no “official” documentation. Different schools have dealt with this in different ways. One of the simplest ways is that if a student has gone through a legal name change
and now is presenting as a different gender, a school may choose to use that as justification and documentation for the gender change. Many advocates see this as the best compromise because it meets the institution’s need for documentation as well as the individual student’s need to have his or her gender correctly noted. Other schools have requested documentation from a doctor (medical or psychologist) documenting that the student identifies as a different gender. This approach can be considered invasive, however, and can put you or your staff in an uncomfortable position, particularly as it opens the door to what (if any) surgery has been performed and what genitalia a student has...all questions we would prefer to avoid.

**SELECTIVE SERVICE REGISTRATION**

One of the most difficult areas for transgender students and our institutions to navigate is the selective service system. Selective Service requires eighteen-year-old males who are either citizens or resident aliens to register. What seems like a simple task with a single purpose actually has become much more meaningful over the years: Federal student aid requires that an eligible student register with Selective Service. Some states and institutions require proof of selective service registration in order to enroll. What does this mean for a transgender student? If you were born male but have legally transitioned to female, should you register? Does it matter if you transitioned before or after you turned eighteen? How do our institutions report on and award aid to someone who is transgender? The organization that has worked most closely with the U.S. Selective Service System on these issues is the National Center for Transgender Equality (NCTE).

**Male to Female Transgender Students**

NCTE’s interpretation is that anyone who was born a male (assigned male at birth) is required to register regardless of current gender. As far as the Selective Service System is concerned, registration requirements are based on birth status. Selective Service bases its information on social security number, so while the student is not able to change gender with Selective Service, he or she is able (and required) to make a name change. For higher education institutions, reporting on male to female transgender students is similar to that for any student with a name change. (NCTE 2008)

**Female to Male Transgender Students**

A person born female and who has transitioned to male is not required to register for Selective Service, regardless of when she transitioned. Again, Selective Service bases gender identification on how someone was identified at birth, so in the case of females, that carries throughout life, regardless of a transition. While this seems straightforward, it is this status that has been one of the most difficult for institutions to report. Many institutions (and individual students) have had difficulty when a female to male transgender student shows up on a report as male but as not having registered for Selective Service. This requires intervention in two different ways: First, the student will need to show that he is both male and exempt by requesting a Status Information Letter from Selective Service that will show the exemption. As for the institution, it is important that we balance the student’s privacy with the reporting office’s (most often financial aid’s) awareness of the records of transgender students so that if a record comes back flagged or rejected because of an issue with the gender notation, it can respond appropriately. (NCTE 2008)

**INCLUSIVE LANGUAGE IN POLICIES**

One of the misconceptions about protections for transgender students is that policies and laws against discrimination based on sex apply to them. Generally, that is not the case. In fact, the policy language that best protects transgender students is “gender identity or expression.” This allows not only for protections of people who are transitioning but also for those who have broken a gender norm. This should be a part of any institution’s nondiscriminatory policy.

However, there are other ways in which language can help students feel more included. Consider, for example, including male, female, and “other” on forms or making gender a fill-in-the-blank response. Even more basic is to challenge ourselves to consider whether gender is a necessary question on every form. Do we really use this information as often as we ask for it? In many cases we do not.

**FACILITIES**

An emerging area of inclusion for transgender students is the addition of “transgender friendly” restrooms in campus buildings. While many transgender students easily pass in society as their new gender, one of the most intimidating
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parts of the transitioning experience is public restrooms. Not only does the need to use public restrooms cause stress, but it also can lead to unwanted discovery and even violence. In some areas, depending on the point at which the individual is in the transitioning process, it could even be a legal issue. Many schools have started incorporating transgender friendly restrooms. A transgender friendly restroom is nothing more than a private single stall restroom which usually also doubles as a family restroom and restroom for persons with disabilities. This simple no- or low-cost gesture can go a long way toward making transgender students feel welcomed and safe on campus.

**CAMPUS HOUSING**

Another unavoidable issue for colleges and universities is how to deal with transgender issues in campus housing. A simple answer would be to allow the transgender student to live in a single room. Frequently, this is a cost-prohibitive option; even if the school makes accommodations to make this cost neutral for the student, the transgender student still misses a portion of the college experience. A better option is to work with the student and talk through his/her comfort level and identity. That can help provide information to match with another student. Because safety can be an issue, the transgender student can assist in explaining his/her situation to potential roommates in order to find an appropriate match. Another solution is provided by “diversity” programs within residence halls where students opt to live on particular floors or in particular buildings based on their acceptance of a variety of issues. Including a question for all diversity program applicants as to the types of students with whom they would be interesting in rooming (e.g., including transgender as an option) can assure a pool of potential roommates for transgender students without forcing the issue of transgender students “outing” themselves to their roommates.

**CONCLUSION**

As our institutions become more diverse, our offices must keep pace by ensuring both that all students feel welcomed and that we are serving them appropriately. For transgender students, this can be most easily accomplished by addressing potential issues in advance and by determining procedures for staff in your office. By familiarizing yourself in advance with the issues and consequences, you can ensure not only that you are acting appropriately but also that you are able to convey a sense of understanding to transgender students.

**REFERENCES**

NCTE, See National Center for Transgender Equality.

**About the Author**

**JACK MINER** is Associate Registrar for Business and Administration at The Ohio State University, where he earned both his bachelor’s and master’s degrees. He serves as chair of AACRAO’s GLBT Caucus and is an advocate for GLBT access to higher education.
Verification of the Integrity and Legitimacy of Academic Credential Documents in an International Setting

By George D. Gollin

The global demand for higher education currently exceeds the world’s existing university capacity. This shortfall is likely to persist for the foreseeable future, raising concerns that frustrated students might choose to purchase fraudulent credentials from counterfeiters or diploma mills. International efforts to encourage the development of reliable, authoritative lists of recognized universities are currently underway. An employer might use such lists and related databases to determine the legitimacy of a school attended by a prospective employee. But an additional approach to credential authentication is possible in which degree verification is performed automatically using the same information security tools that permit secure financial transactions to proceed over open communication networks. It is possible that the development of reliable databases (which require active engagement in order to be useful) in combination with a widely adopted standard for self-authenticating academic documents could drive nearly all counterfeiters and diploma mills out of business.

Public-key cryptography can provide a technical solution to the problem of authenticating academic documents such as transcripts and diplomas. When combined with an appropriate system to manage universities’ public keys (so that only legitimate universities are issued keys by a “certificate authority”), it becomes possible to determine whether a document is genuine or counterfeit, and also whether or not it was issued by a legitimate postsecondary institution rather than a diploma mill.

Interesting lessons can be learned from the history of efforts to suppress fraud in financial transactions. After discussing these, I describe a model for the generation of secure, verifiable diplomas and transcripts.

PAPER CURRENCY, PAPER DOCUMENTS

In 1860, at the beginning of the United States’ Civil War, the manufacture of American currency was managed separately by each state in the Union. Because there was no national coordination of the design of coins and bills, it was difficult for a bank in one state to recognize as illegitimate counterfeit bills that purported to be the legal currency of a different state (NARA 1998). It is estimated that one-third to one-half of the currency in circulation in the United States at the time was counterfeit (USSS 2009).

Suppression of Counterfeit Currency

On the last day of his life, President Abraham Lincoln ordered Secretary of the Treasury Hugh McCulloch to ad-

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1 See, for example, the UNESCO Portal on Higher Education Institutions, available online at <http://portal.unesco.org/education/en/ev.php-URL_ID=49864&URL_DO=DO_TOPIC&URL_SECTION=201.html>.
Beginning with its inception in 1910, AACRAO has promoted leadership in developing and implementing policy in the global educational community with a focus on the identification and promotion of high standards and best practices.

AACRAO’s International Education Services (IES) serves as a resource center for matters on international education and exchange. All of the evaluators in IES have worked for a number of years at institutions evaluating foreign educational credentials for admission purposes. Our staff of professionals has evaluated thousands of foreign educational credentials, and has an average of 20 years of previous evaluation experience before joining AACRAO, with no staff member having less than seven years of experience. Our extensive archives, built up over 35 years, enable AACRAO to accurately research any educational credential in great depth. Historically, this service started with the AACRAO-US Agency for International Development (us-AID) Cooperative Agreement that began in the mid-1960s.

The Foreign Education Credential Service provides evaluations of educational credentials from all countries of the world, assuring consistent assessment of the qualifications of those persons educated outside the United States. The Foreign Education Credential Service is trusted in the field, and our evaluation reports are designed to help any reader to understand foreign academic credentials.

If you are looking for an easily accessible up-to-date electronic resource on foreign educational systems, the AACRAO Electronic Database for Global Education (EDGE) provides a wealth of information for each country profile in a convenient and consistent form. EDGE is a valuable and trusted tool for both novice and experienced international admissions personnel. The database is being expanded regularly and updated as educational systems change. For more information and to subscribe online visit aacraoedge.aacrao.org/register.
THE PEOPLE’S REPUBLIC OF CHINA
A study of the educational system of the People’s Republic of China, from preschool to higher education. Includes information on entrance examinations, vocational education, and a thorough guide to the academic placement of students in educational institutions in the United States.
Item #6536 $85 nonmembers | $60 members (2000)

INDIA
A study of the educational system of India, including the different types of universities, computer and management education, and a detailed list of professional associations in India. Also includes guidelines to the academic placement of students in educational institutions in the United States.
Item #5342 $85 nonmembers | $60 members (1998)

KYRGYZSTAN
The Educational System of Kyrgyzstan describes the current educational structure of Kyrgyzstan and serves as a guide to the academic placement of students in educational institutions in the United States. This monograph contains information on both secondary and higher education, grading scales and a directory of post-secondary institutions in Kyrgyzstan. It also covers transitional issues, fraud and academic corruption.
Item #9020 $45 nonmembers | $30 members (2003)

PHILIPPINES
A study of the educational system of the Philippines from basic to higher education, with information on academic and vocational degrees, and non-traditional education, including Islamic education. Serves as a valuable guide to the academic placement of students in educational institutions in the United States, with information on accrediting agencies and professional education associations in the Philippines.
Item #6537 $85 nonmembers | $60 members (2001)

ROMANIA
A study of the educational system of Romania. Includes an extensive list of sample diplomas, and detailed guidelines for admissions officers in the academic placement of students in educational institutions in the United States.
Item #5339 $75 nonmembers | $50 members (1998)

TAIWAN
An extensive guide to the structure and content of the educational system of Taiwan, from kindergarten through graduate and professional studies. Includes detailed information about schools recognized and not recognized by the Ministry of Education, a vital guide for any admissions officer considering incoming students from Taiwan.
Item #6539 $95 nonmembers | $70 members (2004)

THAILAND
A study of the educational system of Thailand and guide to the academic placement of students in educational institutions in the United States. Covers preschool education onwards, with a particular emphasis on higher education studies, including degrees and teaching methods. Includes information about teacher training, technical and vocational educational and health studies.
Item #5341 $75 nonmembers | $50 members (1998)

UNITED KINGDOM
Offers guidance on the structure and content of the United Kingdom’s education system. The five-chapter guide includes a historical look at major legislative and policy changes affecting the system as a whole, and offers details on the country’s Further Education, Secondary Education, and Professional Qualifications frameworks. Additionally, helpful reference information can be found in the book’s five appendices, including: a key to system-related acronyms; listings of the UK’s higher education institutions and further education colleges; details on the National Qualifications Framework; and a comprehensive listing of professional bodies and learned societies.
Item #9027 $95 nonmembers | $70 members (2006)

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dress this problem. McCulloch created the United States Secret Service in response to the President’s charge (USSS 2009). Though better known now for its mission protecting government officials and foreign diplomats, the Secret Service, for the remainder of the nineteenth century, had currency fraud as its primary focus. The Service moved aggressively against the producers of counterfeit money, closing hundreds of production sites in only a few years and eventually reducing the fraction of U.S. currency in circulation that was counterfeit to well under one-tenth of one percent.

The availability of intaglio process currency printing presses (in spite of international controls meant to keep these out of the hands of counterfeiters), in combination with modern technology, has given rise to new lines of counterfeit notes that are nearly undetectable as fakes. The provenance of these “super notes” is not entirely clear, although the United States Treasury has stated that such notes are believed to be of North Korean origin (Mihm 2006). Thus, some of the concerns this raises are international and inherently political in scope. According to a North Korean defector, “Kim Jong I endorsed counterfeiting not only as a way of paying for covert operations but also as a means of waging economic warfare against the United States, ‘a way to fight America, and screw up the American economic system’” (Mihm 2006).

We expect that the use of counterfeit bills of one country’s currency inside another country is a smaller problem than the use of counterfeits within the purported country of origin of the currency. Moreover, banks and exchange services that buy and sell foreign currency can be expected to train their staffs to reject suspicious or entirely unrecognized coins and bills. For example, it is unlikely that a bank in France would mistakenly issue euros in exchange for Seborgan luigini.\(^3\) As a result, economic hazards associated with the production of currency for an imaginary country like Seborga are almost certainly minimal.

An inherent limitation in paper currency is the low level of scrutiny to which it can reasonably be subjected while still preserving the anonymity of the bearer in casual financial transactions. Is it practical for a clerk in a grocery store to subject a customer’s payment to a neutron scattering analysis? Central to the use of paper currency in small purchases is the absence of a trusted third party who verifies the currency’s legitimacy. Consequently, paper currency can only be as robust against counterfeiting as allowed by countermeasures that can be embedded in individual coins and bills. If a merchant receives payment in unfamiliar currency (for example, from a foreign visitor hoping to use his/her national currency), the risk of fraud increases.

**Problems in Authenticating Paper Academic Documents**

Many of the security issues concerning academic documents are similar to those relating to paper currency transactions. For example, a job candidate might be asked by a prospective employer to provide a transcript showing his university courses and grades. Without confirmation from a third party that the document is valid, how can the employer tell whether the transcript was actually produced by the university rather than by a counterfeiter? Legitimate printers use various kinds of security paper and special inks to make it more difficult to counterfeit their documents. But these also are used by counterfeiters: A high-quality counterfeit transcript, printed on security paper, can be purchased online for less than $100.

An added complication with academic documents is the wide variation from school to school in transcript layout and printing technology. An employer typically is unfamiliar with the standard format of a transcript issued by a particular institution, just as a 19th century U.S. merchant in one state was unfamiliar with the legitimate currency of another state. Ultimately, it probably is more important for a counterfeit transcript to look good than for it to resemble a genuine transcript from the target school. The St. Regis diploma mill sold counterfeits of at least 77 legitimate schools’ documents but made little effort to have such counterfeits conform to the layout and design utilized by those schools.\(^3\)

An employer could ask a job applicant to have a transcript sent directly by the school’s registrar, but this is at

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\(^3\) Seborga is a small community in the Ligurian region of Italy. Seborgan residents pay Italian taxes, vote in Italian elections, and receive the various public services provided to any Italian community by Italy. However, some of Seborga’s inhabitants maintain that the town is not part of the Republic of Italy. The luigino, the Seborgan unit of currency, is generally accepted by merchants inside Seborga. The value of the luigino is pegged to the U.S. dollar at the rate of 1 luigino = $6, making it the highest-valued unit of currency in Europe.

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best a weak attempt at reducing the chance of receiving a counterfeit document. It is a simple matter to find a remailing service that, for a price, can receive a dishonest person’s document and remail it from the same postal district as the university in question.

And what is to be done when a job applicant presents credentials from a diploma mill purportedly located abroad rather than providing counterfeit documents that bear the name of a legitimate school? “West Coast University (WCU)\(^4\) claims to have a campus in Seborga and to be accredited by the “Accreditation Council” of Seborga,\(^5\) but a WCU degree has no more legitimacy outside the not-quite-real country of Seborga than the Seborgan luigino.

It is not practical to expect an academic document delivery system to be robust against determined efforts at fraud without introduction of a trusted third party to assist with verification. Ideally, the third party would confirm that the school named in the document had in fact generated the document, that the document had not been altered, and that the school held proper degree-granting authority according to the appropriate education ministry or state higher education office.

PUBLIC-KEY CRYPTOGRAPHY

The invention in the 1970s of public-key cryptography provided the technical foundation necessary for secure financial transactions to proceed over non-secure communications networks. Using a public-key algorithm, an author can transmit encrypted information (such as a credit card number) over an open line to a reader such that only the reader (but no eavesdroppers who might intercept the transmission) can decrypt the information. The author and reader do not need to share private information, such as a secret decryption key, in order to effect the transmission.

In public-key cryptography, a document is scrambled by its creator using one cryptographic key so that it can be deciphered by its reader using a different key. The two keys are linked and are generated through use of a mathematical algorithm. The keys must be used together in order to encipher and then decipher the message. It is nearly impossible to determine the value of one key with knowledge of the value of the other key.

A participant in a secure transaction who wishes to receive a message will make one of the keys public, perhaps by posting it to the World Wide Web. The other key remains private. Anyone who wishes to send this participant an enciphered file will use the public key to scramble her message. The message can only be deciphered by someone in possession of the private key. By using the public key, anyone can send an encrypted message; but only the intended receiver can decrypt the message by using the private key that is paired with the public key.

Digital Signatures

Public-key techniques also permit the creation of “digital signatures” so that a reader can authenticate an unencrypted document. The signer uses a private key to encipher his/her “signature” and transmits this with the document to a destined receiver. The signer’s public key is freely available and is used by the receiver to decrypt the digital signature. As long as the signer actually did use the private key that is paired with the corresponding public key, the signature will decrypt properly.

The signature allows the reader to determine that the identity of the author of the document is the same as that of the person who created (and posted to the World Wide Web) the public key for her digital signature.

Use of Cryptographic Hash Functions to Verify Document Integrity

A “hash function” generates something akin to a digital fingerprint for a document. The function takes an input file of arbitrary length and generates an output of fixed length. The output changes dramatically with small changes to the input file, so that even the most minor modification will change the file’s hash value significantly.

Often, a hash value is included with the signature information that is encrypted to create a digital signature. After a document is received and the digital signature decrypted, the document’s hash value can be recalculated and compared with the value that was contained in the signature. If the hash values match, the document has not been altered.

Certificate authorities and trusted third parties

Public-key algorithms by themselves can only guarantee the consistency of a document author’s identity from doc-

\(^5\) See [www.seborga-edu.info/Members.html](http://www.seborga-edu.info/Members.html).
A number of initiatives to adapt cryptographic techniques to the academic setting are in progress. The methods used to create a verifiable transcript are simple, nearly unbreakable, and well-suited to documents for which delivery in electronic form (i.e., as PDF—Portable Document Format—files) is acceptable.

It would be appropriate for all academic documents to include hashed digital signatures whose validity would be verified by a commercial certificate authority that would work with a central academic authority (such as a branch of UNESCO). By restricting the certificates to schools with legal degree-granting authority, this document verification system also would serve as a straightforward mechanism for excluding diploma mills.

When a prospective employer opens a PDF-format transcript that contains an embedded digital signature, the software that opens the document (typically Adobe Reader) opens a separate window informing the viewer of the certificate status of the document, making use of key, hash, and digital signature information. If the document is not from a legitimate school, the reading software will offer no verification of authenticity.

**A RECOMMENDATION**

It is appropriate for UNESCO to advocate for adoption of an international electronic security standard for academic transcripts and diplomas. A branch of UNESCO (or some other trusted international academic agency) could and should partner with a commercial certificate authority provider to permit authentication of documents from legitimate postsecondary institutions.

Given progress in this direction, a first step would be to assess the current state of electronic transcript technology and to discuss with interested groups their plans for further development of their systems.

Intelligent management and dissemination of information concerning the legitimacy of higher education programs and credentials is one of the most effective tools to be used in the suppression of diploma mills. If employers were to come to expect that viewing a PDF transcript file should always produce an authentication message, they
might be more likely to identify a bogus transcript from a bogus school for what it is.

REFERENCES
USSS. See United States Secret Service.


About the Author

GEORGE GOLLIN is Professor of Physics at the University of Illinois at Urbana-Champaign. As a faculty service activity, Gollin focuses on topics in international university accreditation with an emphasis on the problem of diploma mills. He serves on the board of directors of the Council for Higher Education Accreditation.
EXPLORE THE NEXT GENERATION OF INFORMATION MANAGEMENT

JULY 19-21, 2009 • TUCSON, ARIZONA • JW MARRIOTT STARR PASS RESORT AND SPA

2009 TECHNOLOGY CONFERENCE
Personal statements are a widely used and popular predictor in academic admissions; however, relatively little is known about their effectiveness as a predictor of student performance. This study involved a meta-analysis of the relationships of personal statements to measures of student performance (e.g., GPA) and other predictors. Results suggest that while they have little overlap with other predictors, personal statements also have small predictive relationships with grades and faculty performance ratings. In addition, once standardized test scores and prior grades are taken into account, they provide no incremental validity.

Beyond standardized tests and prior grades, admissions committees often gather non-cognitive data about their applicants. Many of these data are collected on the basis of convenience, habit, history, and what other institutions are doing; rarely does the collection of such data involve discussion of validity or incremental validity. One of the most common (presumed) predictors of student performance is the personal or biographical statement (Anderson and Shackleton 1993; Gibbs 1994).

Programs collect personal statements and essays for a variety of purposes. The purpose generally depends on the school and its goals, although personal statements usually allow the applicant to provide information that cannot be found elsewhere in the application packet. Currently, little is known about either the predictive power of the personal statement or its usefulness alongside other predictors. Evidence suggests that personal statements, personal essays, and biographical statements are positively related to student performance; however, the magnitude of this effect varies greatly from study to study.

A sense of the effectiveness of personal statements is blurred by the numerous and sometimes ill-defined roles they are supposed to fill. Personal statements are used to measure an applicant’s general drive and motivation; to match a student with an advisor; to assess an applicant’s goals for the future; and to understand an applicant’s past experiences with the goal of measuring skills that will be useful in the future (Powers and Fowles 1996). In addition, it has long been held that personal statements can provide insight into an applicant’s interest in and dedication to a particular field (Freun 1980; Willingham 1974). Personal statements also give applicants an opportunity to explain any weaknesses and to highlight strengths not described elsewhere in the application package. Finally, personal statements are used to evaluate applicants’ writing abilities.

Some research has sought to determine how effective personal statements are at accomplishing these various
purposes. Indeed, some scholars have found that personal statements can be modest predictors of college success (Ra 1989; Smith and Pratt 1966; Willingham 1985). For example, Shahani, Dipboye, and Gehrlein (1991) reported that students’ admissions essay score correlated 0.21 with their grade point average after the first year of college; this is similar to results found in other studies.

Researchers have studied the use of personal statements as a type of biographical data instrument (e.g., Ferguson et al. 2000). Biodata measures have exhibited a positive relationship with future performance across domains, including both academic (Oswald et al. 2004) and work settings (Hunter and Hunter 1984). It is reasonable to hypothesize that personal statements that measure the same characteristics could achieve the same results by providing useful information about past experiences and behavioral tendencies that would yield success in school.

However, biodata measures use structured response formats to collect biographical data about the applicant and are generally based on items chosen through empirical or rational keying (Hogan 1994; Hough and Paullin 1994). Personal statements, as currently used, are largely unstructured measures that are not likely to yield consistent information across applicants. Moreover, they often are typically scored by an impressionistic evaluation which may yield inconsistent interpretation of information. Personal statements often vary with regard to the type and amount of information they contain; data on their psychometric properties are limited (McManus, Maitlis and Richards 1989).

Research also has shown that the personal statement does not fulfill a role as an assessment of writing ability because it is not strongly correlated with tests of writing ability (Powers, Fowles and Boyles 1996). One major cause of this apparent lack of relationship is likely to be the low reliability of judgments of writing ability from a single sample. Additionally, personal statements may be measures of maximal rather than of typical performance. That is, students may invest considerably more in their personal statement than in most other writing tasks. Thus, the personal statement demonstrates what a student can do rather than what he or she will do. Finally, third parties (e.g., parents) may help many students with their personal statements.

Ideally, the personal statement should provide unique information about the applicant. There is a variety of information on the association between personal statements and other predictors, and most evidence suggests that the overlap is modest. For example, the Educational Testing Service (1996) published a correlation of 0.15 between personal statements and professionally graded essays and also found correlations between (i) personal statements and (ii) the GRE verbal exam, the GRE quantitative exam, and the GRE analytical exam ranging from 0.2–0.25. Bronan (1996) reported correlations between the personal statement ranking of 0.04 with the GRE verbal exam, 0.17 with the GRE quantitative exam, and 0.26 with the GRE analytical exam. She found that the personal statement was correlated only −0.01 with the admissions interview by students and 0.25 with the admissions interview by faculty. These results are somewhat encouraging in that the personal statement appears to be modestly related to other measures. This study will examine and synthesize what is known about the predictive power of personal statements and will estimate the degree to which they improve predictions beyond test scores and prior grades.

Both the predictive validity of personal statements and their association with existing validated predictors are needed to establish their utility and provide clarity in the literature as to how useful a personal statement is when other admissions criteria are available. This study attempts to provide robust estimates of both.

**METHODS**

An initial search was done in PsychINFO (1872–2006), ERIC (1966–2006), Education Full Text (1994–2006), and Dissertation Abstracts International (1861–2006) to identify potential relevant sources. The keywords “personal statement,” “biographical statement,” “personal essay,” and “biographical essay” were used in the search. The reference lists of all articles found to contain relevant data were examined in an attempt to identify any other possible sources. Studies were eliminated from inclusion in the meta-analysis if they reported only statistically significant results (as this would positively bias the estimates), did not contain data that could be converted to a correlation, or were not in English.

Each of the relevant articles was coded for the relationship between personal statement and any subsequent school outcome variable. The relationship between personal statement and prior grades, test scores, or any other alternate predictor of performance also was coded. Data were en-
tered from the coding sheets into an Excel spreadsheet. A separate coder double-checked all articles for accuracy of coding. The database also was screened to identify and eliminate any duplicate samples.

Data were analyzed using the Hunter and Schmidt (2004) psychometric meta-analytic procedure. This method allowed for quantitative aggregation of the effect sizes that were coded from primary studies. The sample size weighted mean of the observed correlations was obtained for the predictor-criterion relationships. The standard deviation of the observed correlations also was calculated. Corrections using artifact distributions were not made due to the very limited information available on the measurement reliability of the predictor. The 80 percent credibility interval also was calculated. (The credibility interval provides information about possible moderator effects across samples; large credibility intervals suggest that effect sizes may vary meaningfully across situations due to unmeasured moderators.)

Sufficient information was available to examine the relationship between personal statement and grade point average and faculty rating. Graduate grade point averages were either for first year or for all grades earned in graduate school. Given the strong correlation across years for grades earned in graduate school, these studies were combined into one analysis. Faculty ratings were ratings of students by faculty familiar with the students’ work. Faculty assigned ratings in response to a number of related questions pertaining to the students’ research competence and overall performance. In order to help differentiate the ratings results from the graduate GPA results, we avoided collecting data for faculty ratings of classroom performance.

RESULTS

Results for the analysis of personal statements predicting postsecondary grades and faculty ratings of performance are presented in Table 1. The validity for GPA was very modest, with an average correlation of $r = 0.13$. The correlation between personal statements and faculty ratings of performance was similar in magnitude ($r = 0.09$). The standard deviation of the correlations in the literature and the estimated credibility intervals for these outcomes were small and suggest that the effect sizes do not vary greatly across situations.

Table 2 (on page 86) presents the correlations between personal statements and other predictors of performance. This provides information about the degree of overlap between personal statements and other predictors. If the intercorrelations are large, the information added by using personal statements will be small. Verbal ability tests are correlated $r = 0.27$ with personal statements. Similarly, quantitative ability tests have a small credibility interval and are correlated $r = 0.18$ with personal statements. Prior grade point average correlates $r = 0.17$ with personal statements. However, the credibility interval here suggests much more variability across situations. Finally, personal statements have the strongest relationships with alternate predictors of performance: They are correlated $r = 0.42$ with letters of recommendation and $r = 0.24$ with the interview. The stronger correlation with letters of recommendation may be an artifact, however, because the same group of raters provided ratings on both the letters of recommendation and personal statements in some of the studies included in this analysis.

A full matrix of correlations among predictors (personal statement, test scores, and prior grades) and their

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**Table 1.** Meta-Analysis of Personal Statements Predicting Academic Performance

<table>
<thead>
<tr>
<th>Personal Statement</th>
<th>Number of…</th>
<th>r-Obs¹</th>
<th>Standard Deviation</th>
<th>80% CI²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postsecondary Grade Point Average</td>
<td>4,161</td>
<td>0.13</td>
<td>0.05</td>
<td>0.10-0.15</td>
</tr>
<tr>
<td>Postsecondary Faculty Performance Rating</td>
<td>850</td>
<td>0.09</td>
<td>0.05</td>
<td>0.09-0.09</td>
</tr>
</tbody>
</table>

¹ Sample size weighted mean observed correlation
² Standard deviation of true validity
³ Credibility interval
respective correlations with outcome measures permits estimation of incremental validity. Multiple regression analyses can be conducted using meta-analytically estimated correlation matrices (Becker and Schram 1994). We examined the incremental validity of personal statements using values from a published source (Kuncel, Hezlett and Ones 2001) for predictor intercorrelations. Personal statements did not provide incremental validity for predicting graduate school outcomes after considering test scores and prior grades. The increase in the adjusted multiple $R^2$ when adding a personal statement score to a test and prior grades is zero. The unadjusted increase in multiple $R^2$ is 0.002.

**DISCUSSION**

These correlations summarize the relationships between personal statement scores and performance in school given the available literature. To the extent that the literature reflects typical use of the personal statement, the results suggest that personal statements are not useful for predicting success in school if test information and prior grades are available. However, this is not to say that personal statements cannot be useful. Personal statements may be useful for other purposes, such as matching students with advisors and identifying students who may benefit from remedial programs. They may be particularly useful in assessing applicants’ fit with a particular school, ultimately affecting other outcomes, such as retention. However, this is a list of “maybes” as no research evidence supports these claims. On average, personal statements may serve no useful purpose and may even detract from the overall quality of the admission decision (Dawes 1975). The conclusion of this study is that personal statements in their current form do not, on average, provide unique information that contributes to the prediction of students’ academic performance as measured by grades and faculty ratings.

Although this study represents the most comprehensive investigation of the use of personal statements, it has some important limitations: The meta-analysis is based on a small number of studies; further research is needed to better understand the predictive validity of personal statements. Further, the literature does not provide adequate information on the uses of personal statements, the scoring of personal statements, or the reliability of scoring methods. Thus, it is difficult to know whether personal statements written in response to more specific guidelines show greater predictive validity regarding certain outcome variables. More research on the scoring of personal statements also is required. If personal statements could be systematically targeted at key questions and scored consistently they might yield more information. Finally, more research into the validity of personal statements in fields that require different tests for admission is needed.

We are struck by the number of mismatches we encountered in our investigation. First, the amount of information available on personal statements is not proportionate to their popularity; such statements are nearly ubiquitous in admissions decisions at all levels of higher education. This dearth of information is particularly troubling considering the mismatch between their professed use in support of the goal of increasing accessibility in education and the nearly complete absence of assessments as to whether personal statements yield any predictive bias.

<table>
<thead>
<tr>
<th>Personal Statement</th>
<th>Number of…</th>
<th>r-Obs$^1$</th>
<th>Standard Deviation</th>
<th>80% CI$^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Subjects</td>
<td>Studies</td>
<td>Observed</td>
<td>Validity2</td>
</tr>
<tr>
<td>Verbal Ability Test</td>
<td>1,118</td>
<td>6</td>
<td>0.27</td>
<td>0.11</td>
</tr>
<tr>
<td>Quantitative Ability Test</td>
<td>1,118</td>
<td>6</td>
<td>0.18</td>
<td>0.05</td>
</tr>
<tr>
<td>Prior Grade Point Average</td>
<td>964</td>
<td>7</td>
<td>0.17</td>
<td>0.16</td>
</tr>
<tr>
<td>Letters of Recommendation</td>
<td>543</td>
<td>4</td>
<td>0.42</td>
<td>0.24</td>
</tr>
<tr>
<td>Interviews</td>
<td>776</td>
<td>4</td>
<td>0.24</td>
<td>0.01</td>
</tr>
</tbody>
</table>

$^1$ Sample size weighted mean observed correlation
$^2$ Standard deviation of true validity
$^3$ Credibility interval
Unlocking the Potential of SEM

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against underrepresented groups. This gap in the literature is particularly unsettling given the additional mismatch between the volume of research on personal statements relative to that on the use of standardized tests and prior grades in college and graduate admission across most fields (Kuncel and Hezlett 2007; Zwick 2002). Finally, there is a mismatch between the amount of time invested in reading personal statements and what appears to be the trivial amount of predictive information they provide regarding grades and evaluations. These gaps need to be closed. More research attention needs to be given to the personal statement as a predictor of performance so that an educated decision can be made as to whether they constitute a worthwhile requirement. Other work could be done to systematically study how requirements for personal statements might be improved, both structurally and in terms of interpretation. Current research paints a dark picture for the use of personal statements. This study represents a call to re-evaluate the use of the personal statement in admissions decisions.

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SARA C. MURPHY’s research on secondary students’ success focuses particularly on easing the transition from high school to college. She conducts research on student satisfaction, student performance, student retention, and intervention strategies. One key intervention is the use of learning communities in school. Additional research focuses on selection variables used by undergraduate and graduate schools. Murphy received her master’s degree from the University of Illinois and is finishing her doctorate at the University of Minnesota.

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John Maguire and Lawrence Butler ask several questions in their new book $EM=C^2$. The questions revolve around the loss of control regarding student recruitment, institutional reputation, institutional distinctiveness and destiny, competitive dynamics, and national boundaries. The Internet has troubled the work of enrollment managers in each of these areas. Thus, the authors propose a new approach to enrollment management focused on building a community of communities: hence the title $EM=C^2$.

Chapter One provides a brief history of enrollment management as recalled by Jack Maguire, who is credited with being the first to use the phrase enrollment management, in a 1976 Boston College publication. The major roadblocks to sustainable enrollment at that time (a time not so different from today) included increasing operating costs and tuition, academia’s general dislike of marketing tactics, and departmental isolation or protectionism. The authors suggest that it is the lack of synergy or a culture of collaboration among enrollment-related departments that continues to plague many college campuses.

In Chapter Two the authors have a little fun with Rankingdom, their term to describe the world where college ranking publications have undue influence on prospective college students and their families. Their witty comments are peppered with sage enrollment management advice. One bit of advice that stands out is to focus on fostering a distinctive mission with a long-term perspective rather than concede to the short-term activities that enhance rankings but do little to benefit the institution and its students.

Chapter Three includes a discussion of the limited perspective on enrollment embodied in the traditional enrollment funnel. The authors propose a “multiple funnels approach” whereby students can enter or depart at various successive stages. The funnels include recruitment, inquiry, application, admission, yield, retention, and alumni engagement. This more accurately portrays student decision making and interaction as the college controls only two funnels—namely those having to do with which individuals to consider as prospects and which to admit. A further observation is that using any funnel analogy counteracts both a long-term perspective and student fit as the focus remains on student recruitment and conversion for the upcoming year.

In Chapter Four Maguire and Butler provide the framework for the $EM=C^2$ formula they propose to replace the
enrollment funnel and other institutional tools used by those who perceive enrollment management as merely a functional organization to recruit and retain students. Their model focuses on student/client, support, reputation, and goodwill communities. Chapter Five elaborates on the model by providing a 4 x 4 matrix leveraging descriptive enrollment elements (join, fulfill, represent, steward) and dynamic management elements (understand, inspire, engage, leverage) in which each cell represents “a strategic opportunity for community cultivation” (p. 52).

Chapter Six discusses making meaning out of data and using data to better understand the attitudes and behaviors of institutional constituents. Gaining expertise in this area can inform genuine communication with the most appropriate communities. Chapter Seven focuses on clearly identifying and then articulating the uniqueness of an institution. The idea is to be realistic and authentic about what the institution has to offer rather than reworking the mission to cater to the perceived demands of the student market. This is a refreshing view in so far as it emphasizes being true to an institution’s foundational values, yet it is also challenging—particularly for institutions which sense a diminishing student market for their core offering.

In Chapter Eight Maguire and Butler discuss engaging communities through customer relationship management or problem resolution. They also provide an interesting visual based on satisfaction and retention, highlighting a category they call satisFiction, which is ascribed to students who either persist but are not really satisfied (persistence satisFiction) or who are satisfied but, due to academic, personal, or financial reasons, are forced to drop out (dropout satisFiction). Chapter Nine focuses on institutional communities’ use of common interests to influence one another. Examples include alumni assisting in recruitment and current students volunteering in career services.

Chapters Ten through Fourteen chronicle challenging opportunities (as introduced at the outset of the book) and how they were resolved. Consultants at Maguire Associates developed the cases on the basis of their experience with various client institutions. Topics include stealth applicants, Web postings, college rankings, presidential ambitions, and international competition. The conclusions in each case were not necessarily factually precise but rather were what the consultants imagined would happen as a result of their recommendations. It was reassuring to know this given the idyllic nature of some of the resolutions.

The final chapter touches on organizational change, collaboration, and commitment to community cultivation. The book is divided into short, manageable chapters written using relevant language and appropriate terminology. The authors’ collective sense of humor keeps the reading light, and frequent reference to survey results and quotes by college presidents, faculty, board members, and enrollment managers adds personality to the authors’ claims. The book is theoretical in nature, but its central concepts already have been applied at various institutions. In fact, many colleges may not realize that the strategies they are utilizing have a label.

Certain points seem to have limited applicability to all universities—particularly less selective, small colleges with limited or no endowment. Also, a background in enrollment management theory likely will make the theoretical slant of the book more meaningful. Nevertheless, anyone interested in reading about the future of enrollment management should find this book engaging.

About the Author

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