North East Association for Institutional Research

November 3-6, 2007
New Brunswick, NJ

34th Annual Conference Proceedings

Dear NEAIR Colleagues:

New Ideas, New Energy, and New Brunswick, perfectly describes the spirit of the 34th Annual NEAIR Conference program held November 3 – 6, 2007 in New Brunswick, New Jersey at the Hyatt Regency. Over the past three decades, the NEAIR conference has been a source of new thoughts, new findings and new practical approaches to everyday problems. In New Brunswick the trend continued among the 292 conference attendees and numerous invited guest speakers.

Cindy Clarke, Program Chair, and **Ellen Boylan,** Associate Program Chair, along with their dedicated team put together an exceptional conference program which included 6 keynote/special sessions, 50 paper and workshare presentations, 14 posters, and 15 special interest group and table topics sessions. **Cherry Danielson,** this year's Pre-conference Workshop Coordinator, arranged for 20 workshops on a wide variety of topics for our professional development. To ensure quality, conference presentation proposals went through a blind review process facilitated by **47 of our colleagues**, a first for NEAIR.

These proceedings contain a variety of papers and presentations which were submitted by the authors. Included is the "2007 Best Paper" titled "Understanding Adult Learner Program Completion" by **Marianne Guidos** and **Michael J. Dooris** as well as the "2007 Best IR Report/Practitioner Paper," on "Interactive, Multidimensional NSSE Dashboards Showing Structured Multi-Year NSSE Outcomes: Simple, Uniform Displays to Improve Understanding of Complex Data" by **Janet Easterling.** Congratulations to these well deserving colleagues on their fine work and their awards.

Louise Murray, Local Arrangement Chair, and her volunteers worked diligently to make our visit to New Brunswick and the Hyatt a pleasant and memorable event. **Elizabeth Deignan** and **Eleanor Swanson,** Vendor Coordinators, implemented a new vendor program bringing thirteen organizations to the conference for attendees to learn more about their products and services. Nine of these organizations presented in our vendor showcase time slots.

Beth Simpson, Roland Hall and **Annemarie McMullin Bartlett** made remarkable contributions in our membership services and technology area (conference registration, conference web site creation and maintenance).

And finally thanks go to **Jean Marriott,** Publications Chair 2006-07, and **Bonnie Thomas**, Publications Chair 2007-08, for their excellent work soliciting the submissions as well as compiling, editing, and organizing the conference proceedings.

It has been a pleasure for me to work with this inspired group as well as the dozens of other talented volunteers. We hope that the 2007 NEAIR Conference Proceedings will serve as a reference and resource for your future professional endeavors.

Sincerely,

Martha D. Gray

Martha D. Gray
NEAIR President 2006-07

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** Winner 2007 Best Paper*
*** Winner 2007 Best IR Report/Practitioner Paper*

Acknowledgment

I am proud to present the NEAIR 34th Annual Conference Proceedings that records research work compiled by our members and presented at the 2007 annual conference. This year, 11 NEAIR Colleagues and their co-authors submitted eight conference papers to be included in the Proceedings. In addition to these research papers, 11 presentations are available in the "Members Only" portion of the NEAIR website. Dr. Bonnie Thomas, Carroll Community College, 2008 Publications Chair, joined me in reviewing and editing the submitted papers. I would also like to express my gratitude to my colleagues, Shannon Smythe Fleishman, Prince George's Community College, and Dona Alpert, School for International Training, throughout the past year, for graciously volunteering time to review the NEAIR web pages in ensuring a professional web site for our membership.

Publications Chair, 2006-07
Carroll Community College

CURRENT ACCOUNTABILITY INITIATIVES IN HIGHER EDUCATION (PANEL)

Jerome S. Rackoff, Ph.D.
Assistant VP, Planning & Institutional Research, Bucknell University
Chair, Higher Education Data Sharing Consortium

I have been invited to speak on this panel as a representative of The Annapolis Group, an association of 125 liberal arts college presidents. On June 20, 2007, Earlham President Douglas C. Bennett addressed his Annapolis Group colleagues in an influential speech titled "The Way Forward on College Rankings." The ensuing conversation led to the creation of a Common Information Template Group (CITG) to consider alternatives to the current higher education accountability initiatives. This new group was composed of an Executive Committee of eight Annapolis Group presidents and an IR Committee, also with eight members.

All of the IR Committee members also happened to be from institutions that are members of the Higher Education Data Sharing Consortium (HEDS), of which I serve as Board Chair. All but 22 Annapolis Group schools are also HEDS members, and there is a history of collaboration between these two organizations.

I cannot say much yet about the results of the CITG deliberations, because the group's efforts are still in their early stages. Instead, what I will share with you today are a series of personal observations and conclusions—eleven "big ideas"—drawn from the national dialogue on higher education accountability. Any mistakes are my own. Any wisdom that I may impart certainly owes much to the collective conversations with my colleagues, both on the Annapolis IR Committee and nationally.

Big Idea #1: This time seems to be different…

The higher education community has had endless discussions and debates on rankings and accountability without any real change. Three factors suggest that this time may be different:

(a) The dialogue has changed, with higher education speaking no longer as a *victim* (of unfair rankings and burdensome accountability requirements) but as an *agent* capable of effecting real change. In short, higher education seems to be taking accountability seriously.
(b) The number of players has exploded. There is not time during this panel to review all of the entries in this acronym-rich arena: NAICU, CIC, U-CAN, NASULGC, AASCU, VSA, etc. Among the more recent participants are the impressive new CollegeNavigator of NCES, and the UCStatFinder of the University of California system. One stealth entry: corporations, which are beginning to in their employee benefits packages direct assistance in navigating the college admissions process (*Wall Street Journal*, 10/4/07). Apart from its significance as a kind of full employment act for former admissions officers, corporate involvement may exert additional pressure for transparency and accountability.

(c) There is a convergence of conclusions. The conversations within The Annapolis Group and those reported for the Yale/Education Conservancy meeting of September 25, 2007 suggest the emergence of a series of shared best practice recommendations.

Big Idea #2. The WHAT of an accountability tool will be much less challenging than the HOW.

The convergent recommendations of various groups point to an ideal accountability tool of considerable sophistication. Implementation of such a tool will be very resource-intensive. It will require:

(a) Advanced technical and technological expertise; and
(b) Lots of capital

Big Idea #3. It is time for a broad alliance of collaborators.

Collaboration is demanded both by the resource requirements discussed above, and by the psychology of choice. As choices proliferate, our capacity for rational decision-making diminishes—even to the point of making no decision at all. Prospective students in the United States already have the widest choices of higher education institutions in the world. Let's NOT add another layer of choice by making students decide from among dozens of tools ostensibly designed to help them with their primary decision.

Big Idea #4. By fixating on the term "templates," we have misdirected our focus.

Templates suggest static datasets presented in a standardized format. Is that what student really want or need? Let's think instead of dynamic datasets, formatted in whatever ways will meet an individual student's requirements. What we really need is a robust database fronted by a powerful search engine.

Big Idea #5. No matter what we do for accountability, let's be sure that the data we provide for students are structured in a way that the IR community can access readily for comparative purposes.

The CDS, U-CAN, and similar projects demand significant investment of time by IR professionals, but offer little return in the form of usable peer data.

Big Idea #6. On rankings: (a) they will not go away; and (b) they are not all bad.

We are surrounded by all types of rankings—best beaches, safest cars, best and worst dressed celebrities, etc. It is tempting to say that ranking is a fundamental *human* impulse, but it actually has biological roots. Across all kinds of animal societies we see examples of "pecking orders," which are essentially social ranking systems.

Even non-scientific rankings provide useful shortcuts for people who lead busy, multi-tasking, 24/7 lives. But rankings can be much more; they can be both extraordinarily powerful and

useful, IF they involve:

(a) user-selected criteria; and
(b) user-defined weights.

Users of such a system soon discover that the number of rankings is infinite, and that they need to decide which ranking is right for THEM.

There is also another rankings model—drawn from search engine technology—that has NOT received previous attention in the higher education accountability debate. When one inputs a series of search criteria into a search engine, one receives a set of search results. All search engines employ some algorithm to determine the sequence in which the results are presented, but some utilize an index of similarity—often a percent—that is used not only to rank the results but to quantify how close the results match your original search criteria. This would be incredibly beneficial to students in the college search process.

Big Idea #7. We need to use fuzzy logic.

Systems that apply your search criteria too rigidly provide solution sets that are too limited. Let's consider an example in which I choose six criteria for college selection, the last being "no Greek system." Let's further suppose that the search engine finds a series of perfect matches on the first five criteria, but all of those schools have modest Greek systems. As a prospective student, I would never see those college prospects—even though one of them may actually be my best choice. Search systems employing fuzzy logic would be more forgiving. They would allow the users to see these schools, and to decide for themselves whether the schools are worth considering based on their strengths in factors 1-5.

The next two "big ideas" deal with necessary compromises:

Big Idea #8. It will be a challenge to address simultaneously the multiple audiences that have a legitimate need for college information.

The potential audiences for a college information tool are quite diverse:

(a) Prospective students – the primary audience, but also…
(b) Their parents
(c) Legislators
(d) The media
(e) High school guidance counselors/college advisors
(f) College search advisors working for corporate benefit programs (NEW)

Big Idea #9. We need to balance the information students WANT and what they NEED (even if they do not know they need it).

Colleges and universities, subject to the standards of their accreditors, are probably well-equipped to decide what students NEED. But what students WANT is not always so evident. Several groups (AAC&U, The Education Conservancy) have been conducting student focus

groups to learn better what students want. Those results, however, will bear close inspection, based on the CIRP data released in August 2007 by the Higher Education Research Institute at UCLA.

Most of us are familiar with the data suggesting that rankings in national magazines are only the 8th most important source for student college choice. The CIRP data, however, show that rankings were very much more important for certain, key groups of students:

(a) Those with SAT > 1300
(b) Those from families with higher incomes
(c) Those who are members of minority groups
(d) Those who plan to major in engineering, business and the natural sciences.

In short, ranking are very important for many of the types of students that our institutions most want to recruit. In addition, rankings are of greater significance to students at certain types of institutions: highly selective private universities and highly selective non-sectarian four year colleges. So what do students want? The answer: it depends.

One conclusion from this data is that those scheduling student focus groups need to be sensitive to differences of potentially large magnitude based on socioeconomic status, race/ethnicity, and program interest, among other factors. A second conclusion: if rankings are important to these groups, let's provide them with *our own* ranking tools that are both powerful and meaningful.

Big Idea # 10. On functionality: As sophisticated consumers, students will want from a college tool no less than what they are used to getting when they shop online for a camera or a car.

The market potential of online shopping has fueled the development of highly sophisticated "shopping engines" that can readily provide side-by-side comparisons of products based on the features that are important to consumers. Would our prospective students be satisfied with anything less?

Big Idea #11. Data is not enough; prospective students also need something akin to college "metadata."

For all students, college selection tends to be overwhelming and anxiety-producing. For many, their response is neither systematic nor rational. For example, at my institution, Bucknell University, a rural baccalaureate liberal arts and professional institution of roughly 3500 students, three of our strong admissions competitors are Cornell University, Johns Hopkins University and Boston College. All are much larger than Bucknell, all are research universities, and two are urban (arguably three, as Cornell is a city unto itself).

Why should the college search process produce such disparate, dissimilar choices? I acknowledge that there may be similarities among these institution on factors other than size, location and institutional type—similarities that may be very important to students. For many,

however, there has been an absence of prior reflection on key values choices relating to higher education: big/small; rural/urban; baccalaureate/research university; etc.

A college search tool must therefore be more than a data repository. It must serve an educative function, by teaching prospective students a protocol for a systematic, rational college search process. There are various ways in which this might be accomplished, including a pre-search values clarification interview process, or the marshalling of values through choices of search variables and variable weights.

All of us in the higher education community want to educate our students to become citizens who can make good decisions about their lives. We must start earlier in this process, because one of the biggest and most important decisions in our students' lives occurs before we even have them in our classes and on our campuses. All of us benefit if students learn to make informed choices of colleges that will maximize their opportunities for success and personal growth and development. The ability to choose in this way is not a matter just of data and knowledge; it requires skills that rank very high in Bloom's Taxonomy of Learning Objectives—analysis, synthesis and evaluation.

A Cautionary Postscript on Transparency

Physicists have determined that it is theoretically possible to make a person completely invisible. The individual would stand in a pod made of material specially designed to bend light around it. The effect would be one of complete transparency. There is only one problem: the individual inside the pod would be completely blind, as light would not be able to get out. (Paraphrased from the *Scientific American* podcast, "Science in a Minute.")

DIFFERING EXPERIENCES, ATTITUDES, AND FUTURE PLANS OF GRADUATING SENIORS: TRANSFERS VS. NATIVE STUDENTS

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Tufts University

In the United States, college students are generally thought of as students who apply for admission to, select, and ultimately graduate on time from a single 4-year institution. This type of student is now referred to as "traditional". However, the reality can be quite different and far more complicated. In this day and age, traditional students are no longer necessarily the norm, since "between one-fifth and one-third of bachelor's degree recipients began their freshman year at some other institution" (Volkwein, King & Terenzini, 1986). Through the years, transferring from one institution to another has become more commonplace for a variety of reasons and many institutions have developed agreements with other institutions to facilitate the process of applying for admission and transferring credits called articulation agreements (Armenio, 1978). A sizeable and growing number of students attend two or even more institutions consecutively (transfer students), or even concurrently (double-dipping), during their undergraduate career (Armenio, 1978; Borden, 2004). To further complicate matters, some students transfer multiple times to multiple institutions and end up transferring into an institution from which they transferred earlier, and this has been named "student swirl" (Borden, 2004).

Janasiewicz (1987) found that the most common reasons transfers leave an institution are financial difficulties, a general dissatisfaction with the school, their desired major/area of interest not being offered by their current institution, or transferring "up" to a more prestigious school. In the case of 2-year/junior/community college students, successful transfer to an institution to continue studies past an associate's degree is part of an institution's mission (Jones & Lee, 1992; Peters, 1992).

Much of the existing literature has suggested that transfer students are academically inferior to their native counterparts. Research in this area generally finds that in comparison to native students, transfer students have lower grade point averages (GPA), lower persistence/retention/graduation rates, and take longer to qualify to graduate (Porter, 1999; Miville & Sedlacek, 1995; Peters, 1992; Lorentz & Benedict, 1996).

Adding to the complexity of the situation, transfer students tend to experience "transfer shock" upon entering a new institution (Miville & Sedlacek, 1995). Transfer shock is a decrease in academic performance at their new institution as compared to that seen at their previous institution. Jacobs, Busby & Leath (1992) reported that transfer shock often wears off and academic performance rises once again after awhile at the new institution.

Transfer students have been found to experience other unique challenges at their new institutions. They tend to find a lack of advising, or that of good quality, to be an impediment to their adjustment & success at their new institution (Britt & Hirt, 1999). Transfers also tend to feel that faculty and staff at their prior college showed more interest in them as individuals, and as a result were more satisfied with their original institution after transferring (Vaala, 1991).

Further, Volkwein , King & Terenzini (1986) found that " (transfer) students' perceptions about the quality and strength of their relationships with faculty are significantly associated with two measures of intellectual growth". Participation rates in extra- or co-curricular activities at a transfer student's new school tend to be lower in comparison to their former school (Ose, 1997). Transfer students are more likely to be knowledgeable about and expect to use various services on campus (including counseling) as compared to their native student counterparts (Miville & Sedlacek, 1995). Other issues transfer students face are administrative challenges such as transferring credits, trying to register for classes and obtain campus housing at non-traditional times of year, adjusting to another institution, and living with the marginalization and stigmatization of being a transfer student (Vaala, 1991; Peters, 1992; Jacobs, Busby & Leath, 1992). Transfer students are a population that tends to get overlooked by the institution in general, because the institutions form their programs, processes, and schedules to meet the needs of traditional students while often not considering the special circumstances and needs of transfers. This is especially true with respect to the various student services. As a result, transfer students are left feeling isolated, ignored, and as if they are not cared for and do not belong (Kodama, 2002). Moreover, transfer students can be stigmatized as being of being poorly prepared for college academically (Green, 1988). From personal experience, the stigma can extend to characteristics outside of the academic realm, such as being thought of as indecisive, immature, or not thinking through the college selection process carefully the first time around.

Despite the research that is available on transfer students, there seem to be a number of flaws and oversights within the existing literature. Most of the existing research on transfer students: 1) examines why students leave an institution/become transfer students, not what happens to them at their next institution, 2) focuses on retention/persistence/graduation rates or the difficulty of the transfer process, not the long-term experience of the transfer student, and 3) assumes that transfer students come from a 2-year/community college and are therefore less academically prepared. Although this may be true in many cases, it is not necessarily so, and Holahan & Kelley (1978) found that the institution from which a student transferred can impact their academic performance, as well as attitudes about and experience at their current institution. Tufts University is a private institution with very selective admissions criteria, so our transfer students may be qualitatively different than those studied previously. Therefore, this prior research leaves many questions unanswered and issues unaddressed. In addition, this author transferred between institutions as an undergraduate and experienced some of the challenges and felt the stigma associated with being a transfer student. This author was curious to determine if the undergraduate experience of transfer students is different from that of native students, and whether these differences might be apparent in the Tufts University Senior Survey 2006 data.

Method

Each spring, the Tufts University Office of Institutional Research & Evaluation administers a comprehensive Senior Survey to all seniors in the graduating class on behalf of the entire administration. The survey contains a mix of quantitative and qualitative items. These items cover a variety of topics from their employment & graduate school plans, their satisfaction with various services & programs on campus and other facets of the university, their perceptions of the academic experience, future education and employment plans, participation in study abroad and community service activities, desire to participate in alumni activities, just to name a few.

Other items include demographic information, such as whether they transferred to Tufts from another institution. Tufts University Class of 2006 Senior Survey yielded a response of 1,194, for a response rate of 85.0%. Of these, 87 are transfer students and the remaining 1,107 are native students.

Each year the Senior Survey data is merged with data from other sources such as the Student Information System (SIS) to include variables such as math & verbal SAT scores, cumulative Tufts GPA, and so on. For this analysis, data from the National Student Clearinghouse (NSC), a database that tracks individual students' progress throughout their higher education academic career, was also merged into the data file. These variables include which institution(s) students attended previously, what type of institution (public or private) each of their previous institutions were, how long they studied at each school, and other related information.

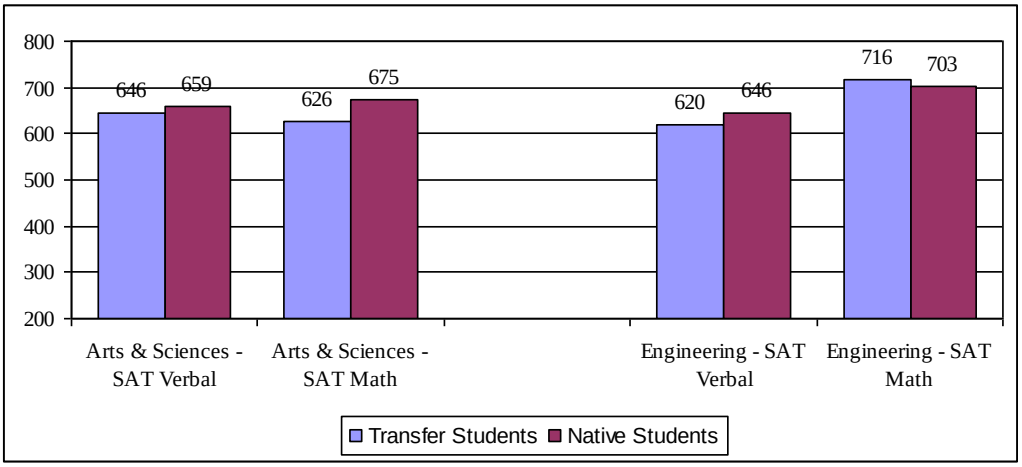
It is known that this methodology may not be the best way to study our transfer student population and their experiences at our institution since this study uses generic survey responses of those who have succeeded to graduate, and in a timely manner, which certainly biases our sample. A more robust design would include a broader range of transfer students and ask them to respond to items specific to their experience as transfer students regardless of whether they were eventually successful in graduating. However, the transfer student population on our campus is small, and transfer student issues are not of broad concern. Therefore, this imperfect methodology was used to explore what information might possibly be gleaned in this way. Perhaps if anything interesting is found, it will inspire a more robust study on this topic.

Results

Data from the National Student Clearinghouse indicated that transfer students had attended a range of one to four institutions prior to their enrollment at Tufts, with a mean of 1.31 schools. Nearly 95.6% of the schools transfer students had attended previously were 4-year institutions.

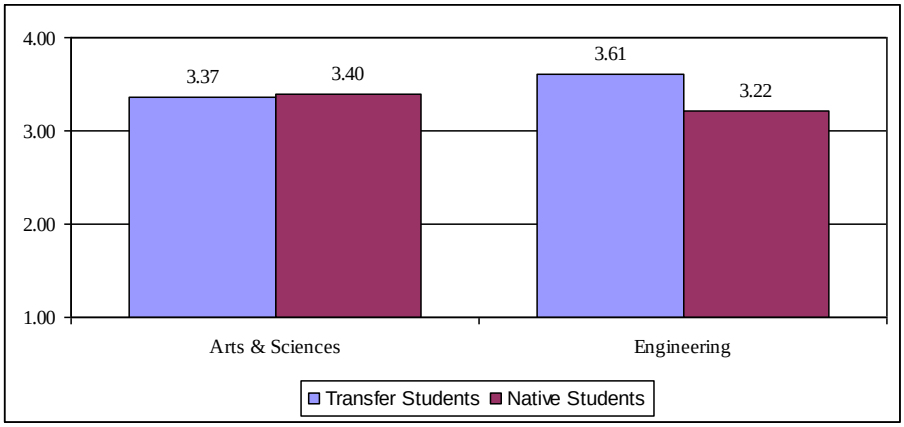
Using SIS data regarding incoming SAT scores, it was found that native students in both schools tended to have somewhat higher mean SAT scores than transfers for both verbal and math, but there was one exception. For Engineering students, transfers had a higher mean math SAT score than did natives (716 vs. 703, respectively). See Figure 1. The differences in mean scores for the verbal SAT were not statistically significant, while the mean math SAT scores were significantly different between transfers and natives for Arts & Sciences students but not for Engineering students.

Figure 1. Transfer and Native Students' Mean SAT Scores by School



Transfers and native students in the School of Arts & Sciences did not differ significantly regarding their cumulative GPA. However, Engineering transfers and natives did have significantly different cumulative GPAs, but again not in the manner that might be expected based on previous research findings. As shown in Figure 2, transfer students in Engineering[1] had significantly higher cumulative GPAs than native students.

Figure 2. Transfer and Native Students' Cumulative GPA by School



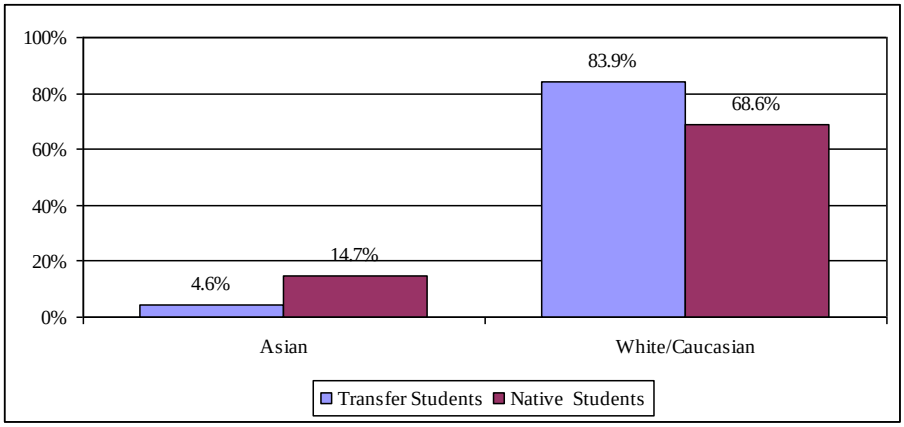
There seem to be some slight differences in pre-college academic preparedness between transfers and natives, but not always in the direction that might be expected based on the previous research. In addition, the mean GPAs did not reveal any difference between transfers and natives in Arts & Sciences and revealed a significant difference in an unexpected direction for Engineering students. These results seem to support the argument that the existing literature may not necessarily apply to the transfer student population at Tufts. Now that this has been established, what might the responses to the Senior Survey tell us about our transfer students?

[1] It should be noted that the Engineering transfer group consists of just 6 students as compared to the Engineering native group which contains 162 students.

Demographics

Transfer students were significantly more likely to identify themselves as White/Caucasian than were native students, while transfers were also significantly less likely than natives to identify themselves as Asian. See Figure 3. Transfer students were also significantly less likely than native students to have received financial aid at some time during their undergraduate career (40.2% vs. 54.5%, respectively).

Figure 3. Racial/Ethnic Differences between Transfer and Native Students



Participation in Co- or Extra-Curricular Activities

Transfer students reported statistically different rates of experience with certain co- or extracurricular activities. As shown in Table 1 below, transfer students were significantly less likely than native students to report having experience with study abroad, fraternities and sororities, and the Experimental College (a.k.a. Ex-College)[2].

Table 1

Percentage of Students Reporting Experience with Co- or Extra-curricular Activities at Tufts

	Transfer Students		Native Students			
	%	N	%	N	df	p
Study Abroad	36.6%	30	52.3%	557	1	.006
Fraternities or Sororities	19.5%	16	31.3%	330	1	.028
Experimental College (a.k.a. Ex-College)	50.0%	40	62.3%	655	1	.029

[2] The Experimental College (a.k.a. Ex-College) started as an experimental expansion of the undergraduate curriculum in Arts & Sciences in the 1960's. The goal was to offer students innovative courses on contemporary issues and unique interdisciplinary topics, many of which feature collaborative teaching and are designed to be discussion-based with high levels of student participation. For more information, please visit http://www.excollege.tufts.edu/.

Experience with Campus Services/Facilities

Transfer students reported statistically different rates of experience with certain campus services and facilities. As shown in Table 2, transfer students reported significantly higher rates of use for the Registrar and Class Deans[3] in comparison to native students. Transfer students reported significantly lower rates of use for tutoring, student employment services, dining/food services, student housing/residence halls, laboratory facilities, and the Asian American Center.

Table 2

Percentage of Students Reporting Experience with Campus Services/Facilities

	Transfer Students		Native Students			
	%	N	%	N	df	p
Registrar's Services	86.6%	71	68.7%	721	1	.001
Tutoring from the Academic Resource Center	14.5%	12	32.5%	342	1	.001
Class Deans	70.7%	58	53.9%	571	1	.003
Student Employment Services	18.1%	15	33.9%	359	1	.003
Dining/Food Services	92.6%	75	98.6%	1036	1	.000
Student Housing/Residence Halls	82.9%	68	97.2%	1018	1	.000
Asian American Center	4.9%	4	14.9%	158	1	.012
Laboratory Facilities	33.7%	28	48.3%	511	1	.010

Reasons for Attending Tufts Summer Session

All Senior Survey respondents were asked if they attended at least one of Tufts' Summer Sessions. Those who attended a Summer Session were then provided with a variety of items relating to their reasons for attending and satisfaction with the experience and the services available. With respect to the reasons for attending the Tufts Summer Session, transfer students were more likely than native students to indicate that academics (wanting to accelerate their degree program or catch up on coursework) were a factor in their decision. As shown in Table 3, the difference in responses to "accelerate degree program" was just barely significant, while the difference for "catch up on coursework" was not statistically significant but was approaching a significant level.

[3] The description of Class Deans found at http://studentservices.tufts.edu/academicservices.htm states that "Class deans oversee the overall academic progress of undergraduates at Tufts. Students in each class year in the College of Liberal Arts have an academic dean and all undergraduates in the School of Engineering have one academic dean. Students should consult their class dean with questions relating to any of the following: academic and intellectual direction, academic difficulty, issues that are affecting course work, extended absence from class, choice of major, change of advisor, leave of absence".

Table 3

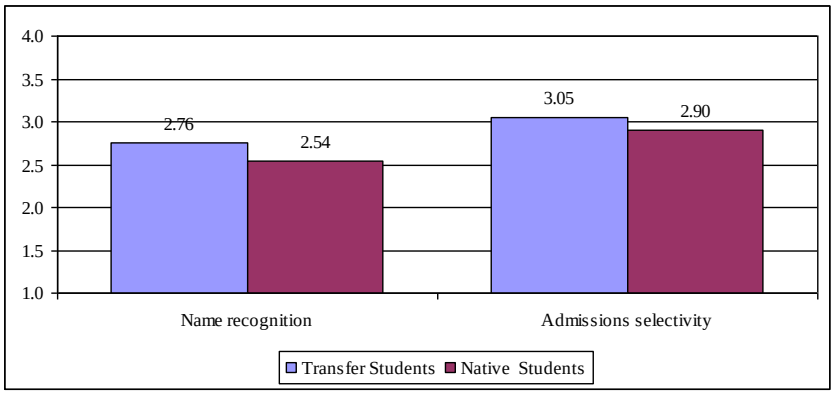
Percentage of Students Reporting Academic-related Reasons for Attending Tufts Summer Session

	Transfer Students		Native Students			
	%	N	%	N	df	p
Accelerate degree program	14.9%	13	8.6%	95	1	.048
Catch up on coursework	24.1%	21	16.8%	185	1	.080

Perceptions of Tufts

When asked to compare Tufts to other institutions, transfer students gave Tufts significantly better mean ratings than did native students for items regarding name recognition and admissions selectivity. See Figure 4.

Figure 4. Perceptions of Tufts in Comparison to Other Institutions



Scale: 1 = Poor, 2 = Fair, 3 = Good, 4 = Excellent

Post-Graduation Plans

When asked about their primary and secondary fall activities following graduation, transfer students were significantly less likely than native students to indicate a secondary activity would be part-time paid employment, but transfers were more likely than natives to indicate their secondary activities would include additional undergraduate coursework, starting/raising a family, or that they were completely undecided about their plans. See Table 4 for more details.

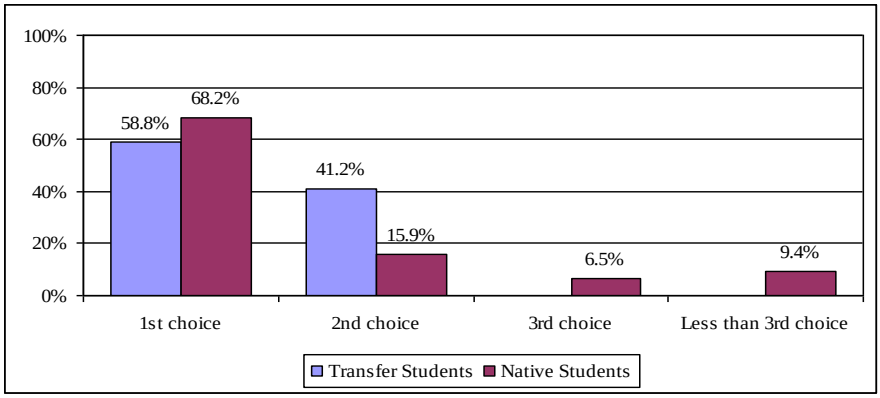
Table 4

Percentage of Students Reporting Secondary Fall Activities

	Transfer Students		Native Students			
	%	N	%	N	df	p
Employment part-time paid	5.7%	5	15.7%	173	1	.012
Additional undergraduate coursework	9.2%	8	3.1%	34	1	.003
Starting/Raising a family	9.2%	8	2.5%	27	1	.000
Completely undecided	12.6%	11	7.2%	79	1	.064

Those who indicated they planned on attending graduate or professional school in the fall following their graduation were asked for their personal rank of the school they will be attending. Transfer and native students' pattern of responses was found to be statistically different using Chi Square analysis $X^2(3, N=262) = 8.688$, $p = .034$. As can be seen in Figure 5, native students were more likely than transfers to report that they would be attending their first choice school, while transfers were attending their first or second choices exclusively.

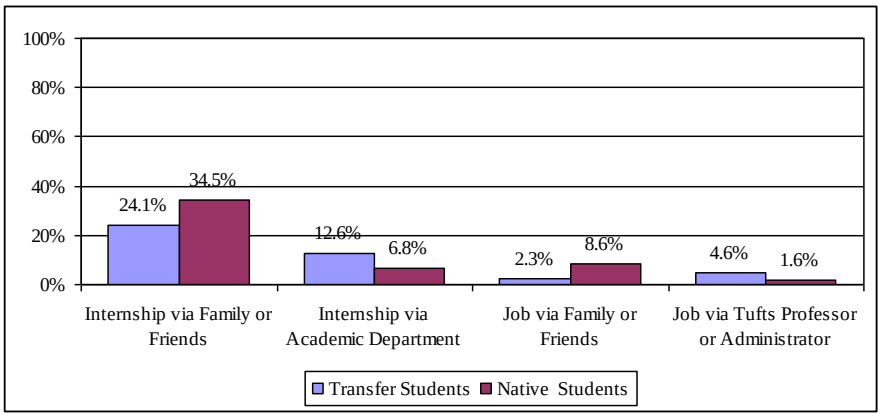
Figure 5. Transfer and Native Students' Personal Ranking of the Graduate/Professional School They Plan to Attend in the Fall



Career Services

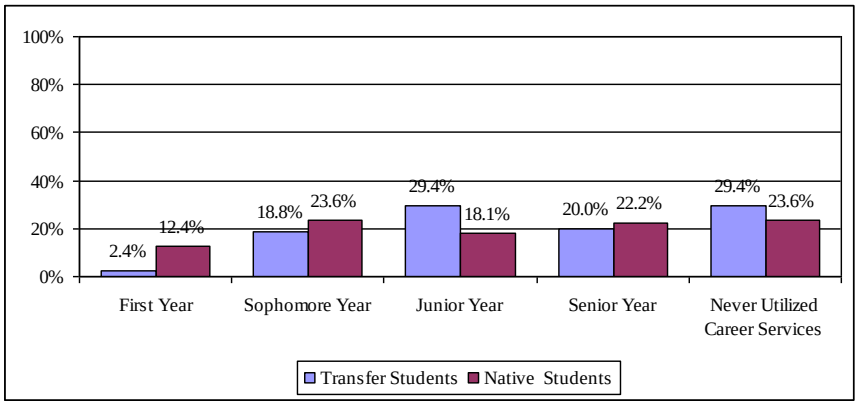
Senior Survey respondents were asked to select all that apply from a list of ways in which they could have learned about internship and job opportunities. It is interesting to note that transfer and native students differed on some of their patterns of responses, and that these patterns were similar between the internship and job lists. As shown in Figure 6, native students were significantly more likely than transfers to indicate that they learned about their internship and job via family or friends. Transfer students were significantly more likely than natives to report that they learned of their internship or job via their academic department or Tufts professor/administrator.

Figure 6. How Transfer and Native Students Learned about Internship and Job Opportunities



As might be expected, the peak usage of Career Services for transfers occurred one year later than it did for natives. See Figure 7. Transfers were also more likely than natives to have not used Career Services at all during their undergraduate career.

Figure 7. When Students First Used Career Services



Anticipated Involvement in Alumni Activities

On most items, transfers were significantly less likely than natives to indicate they anticipated being involved in alumni activities. The one exception to this trend was that transfers were somewhat, albeit significantly, more likely than natives to anticipate making a donation towards their class reunion gift. See Table 5.

Table 5

Would You Consider:

	Transfer Students		Native Students			
	%	N	%	N	df	p
Attending your first homecoming	19.3%	16	33.6%	348	2	.020
Participating in 5 year class reunion	38.6%	32	48.8%	506	2	.000
Attending regional chapter activities in your city	18.1%	15	25.7%	263	2	.034
Registering for the Tufts Alumni Online Community (free)	53.0%	44	65.0%	671	2	031
Submitting a Class Note to Tufts Magazine about your success	15.9%	13	20.6%	212	2	.033
Making a contribution to your class reunion gift	24.1%	20	20.1%	208	2	.005
Joining a special alumni affinity group that was formed by your peers	15.7%	13	20.5%	211	2	.044

Discussion

Although far from being the definitive study on the academic preparedness, unique attitudes and experiences of transfer students, the findings do suggest that the type of transfer students investigated in the previous literature do not seem to match the type of transfer student seen at Tufts University. Our transfer students came predominantly from 4 year institutions. They were not necessarily less academically prepared than native students, and transfer students tended to perform just as well once they arrived on our campus, if not better, in comparison to native students. However, transfer students were significantly more likely than natives to report academic-related reasons for attending summer sessions.

Despite this, some of the findings were consistent with the existing literature (transfer students participating in fewer co- and extra-curricular activities, transfers being more likely to cite academic reasons for attending summer session). In addition, the previous research suggested that transfer students are often more savvy about the services offered by the institution and use them more frequently than their native counterparts. This study suggested that transfer students use the Registrar's Services and Class Deans to a significantly higher degree than did native students, but transfers were also significantly less likely than natives to use certain other services and centers.

Transfer students graduating in the Class of 2006 were more likely to identify themselves as White/Caucasian and less likely identify as Asian than were natives. Transfers also were significantly less likely to have received financial aid at some time during their undergraduate career. In general, transfer students were less likely than natives to feel they would consider being active in alumni activities, with the exception of making a contribution to their class reunion gift in which transfers were more likely than natives to anticipate being involved.

The results suggest that transfer students originating at a 4 year institution might be qualitatively different than those originating at a community or 2 year college and that transfers are not necessarily less academically prepared than native students. In addition, the different pattern of responses between transfers and natives suggest that their experiences, attitudes, and use of services may be impacted by transfer status. The analysis has yielded some interesting results that hopefully will inform and inspire more extensive and robust studies in this area.

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IDENTIFYING THE PEERS OF A PRIVATE INSTITUTION: AN ANALYTIC APPROACH TO AN EMOTIONAL ISSUE

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"Who are our peers?" Answering this question presents political as well as technical challenges. When matters of judgment are involved, the early participation of stakeholders may contribute to widespread acceptance of the results. A study at Moravian College (PA) relied on an analysis of agreed-upon institutional characteristics to derive a national peer list. After applying an initial filter for basic characteristics, dissimilarity measures (distance functions) were used to trim a list of 110 candidates, first to 55 "similar" institutions and eventually to a list of 24 peers. The 17 numerical variables used in the analysis were weighted to reflect their perceived importance to the institution. Our approach differs from other hybrid methods in that the "informed judgment" of campus leaders was sought before rather than after the statistical analysis, resulting in buy-in even before the results were known.

Background

The literature emphasizes that determining a comparison group involves political as well as technical considerations. Stakeholders, whether on campus, at the system level, or in the government, may have differing preconceptions of a suitable peer group. In the final analysis, statistics may be eclipsed by considerations of competition or aspiration.

Several universities and systems report a "hybrid" approach that combines statistical scoring with qualitative review by campus officials, in a method pioneered for the Kansas Board of Regents (Cleaver, 1981). Others use the National Center for Higher Education Management Systems (NCHEMS) peer selection process that trims large initial lists using a combination of gates (filters on raw data), weighted scores, and thresholds, all based on user preferences, along with a "very modest statistical algorithm." These methods are compared in widely-cited papers of Brinkman and Teeter (1987) and Teeter and Christal (1987).

Brinkman and Teeter (1987) described a typology of procedures for developing comparison groups on a scale that ranges from judgment-free to judgment-dependent. At one end are purely statistical procedures, notably cluster analysis and its relatives. The other extreme is reliance on the "informed judgment" of a panel. The Kansas hybrid and NCHEMS process hold the middle ground. The authors used the four approaches to select peers for the University of Kansas. The results are difficult to compare; the two most data-driven methods each produced 16 peers while the panel identified only five. As noted, even a "purely" data-driven statistical approach requires an exercise of judgment in selection of attributes (variables) to be included and in setting parameters of the methods.

Weeks et al. (2000) developed peer groups for Oregon's seven universities to serve multiple uses by campus leaders, legislators, and the governor's office. Following Teeter and Christal (1987) and others, they combined appropriate statistical data with informed administrative

judgments of key campus participants in a year-long effort of "analytical rigor and political sensitivity." In this case, quantitative and qualitative phases were followed by a distinctly political phase of formal communication, negotiation, and decisions by the university presidents. The paper discusses conditions that contributed to success and the related corrections and compromises.

Lang (2000) developed a method for jointly selecting peers for the University of Toronto and measuring (interinstitutional) diversity, following the Kansas approach. He observed that results were highly dependent on weights assigned to the selection variables.

Among the presentations at NEAIR, Szelest (1996) described development of a peer list for SUNY Albany to serve first in a system-wide planning process and later for performance and financial measures. Noting a lack of standard techniques for such research, he discussed the selection of 38 variables ("biased in favor of financial and quality considerations") that reflected concerns of campus leaders. He used two statistical methods, a rank distance (Euclidean metric based on percentile rank instead of *z*-scores) and cluster analysis (based on factors found by principal component analysis).

Consistent with the identity of New Jersey City University as a state-supported "urban university," Kramer (2005) analyzed IPEDS data for 223 public institutions based on Carnegie classification, minority enrollment, and degree of urbanization of the setting. Dowd et al. (2004) reported on several benchmarking projects for community colleges and Rezendes (2005) presented at NEAIR on selecting peer institutions for community colleges.

Considering their interest in benchmarking for accountability, it is understandable that much of the literatures come from state systems and public institutions. At private colleges and universities, the choice of selection criteria may be very different. In an AIR presentation, Zhao and Dean (1997) combined the NCHEMS threshold and Kansas hybrid approaches to identify peers of the College of St. Rose in Albany, NY. Some 68 candidate institutions had appeared in previous college studies or passed through certain gates based on raw data (enrollment, tuition, and region). The additional institutional descriptors were 33 variables of membership, size, quality, price, and finance, all given equal weight. Hierarchical clustering identified 32 candidate institutions for further investigation. Upon review, the administration selected the 19 in-state and added two traditional peers. The authors report, "Because our hybrid approach made full use of the available information [including administrator input], the peer group we developed has since been used by several College constituencies in their comparative studies."

Also at a private institution, Smith (2000) approached the problem through multi-dimensional scaling. Based on 15 indicators, he ordered 103 members of the Higher Education Data Sharing (HEDS) consortium by their "distance" from Trinity College in two- and again in three-dimensions determined by factor analysis. Data from the HEDS consortium were also used in a 2003 study at St. Olaf College (private communication). The reliance on data shared through consortial agreements limits candidate institutions to the members of the consortium, indeed those who share information fairly consistently. Now that researchers can easily mine the extensive IPEDS database, this may no longer be necessary.

Data Sources, Methodology, and Results of Analysis

Generating the list of candidate institutions was an inclusive process; colleagues were invited to contribute; institutions that had been used for comparisons in the past were added, and the Carnegie Classification website, college rankings, and affinity groups were checked for obvious omissions. The resulting list was filtered to eliminate public institutions, single sex colleges, and doctoral-granting institutions (as identified by IPEDS); 110 candidate institutions were identified.

The statistical analysis was based on 17 quantitative variables discussed and endorsed by the senior staff as representing characteristics of the college. Areas included enrollment, test scores, tuition, resources (per FTE student), the proportion of incoming students who are transfers, and the percentages of full-time students, men, and graduates with arts and sciences majors (but not performance indicators such as persistence rates or alumni giving). IPEDS data provided fifteen; U.S. News' *America's Best College*s provided the percentages of students eligible for Pell grants and those living in campus housing.

To compare data of different magnitudes and units, the *z*-score (distance from the sample mean, as measured in standard deviations) was computed for each data point. For easier understanding of the findings, we subtracted the *z*-scores of the target college, producing for each candidate institution a vector of "distances" to the target in the 17 variables individually.

The overall "distance" in this 17-dimensional space from each candidate to the target institution was found using multiple similarity/dissimilarity measures available in SPSS, including Euclidean, "city block," and Minkowski metrics, and customized functions with user-defined weights (as in the statistical scores of the Kansas method). Choice of weights was influenced by computed correlations between variables (such as the 25^{th} and 75^{th} percentile SAT scores, whose weights were consequently lowered) and unintended effects of the college's evening division. Finding no reason to select one distance function over another, we averaged the distances we had computed.

In the end, we used a two-step process in which the original list of 110 institutions was reduced first to 55. The analysis was repeated with new z-scores relative to the means and (much smaller) standard deviations of the smaller sample.

When the 55 “similar institutions” were ordered according to their distance from target, gaps in the data suggested natural locations for the peer boundary that would yield a peer group of 16, 24, or 30. Senior staff recommended the list of 24, which the trustees endorsed.

We remark that our method was not a hybrid approach in the sense of Teeter and Christal [1987]. While stakeholders were consulted about questions of research design, and they could not revise the membership of the lists that were derived. Their “informed judgment” was sought only to review and endorse the methodology and to provide candidate institutions for the first step of the analysis.

Conclusions, Implications, and Open Questions

The dissimilarity measure approach, which is more general than the weighted statistical scoring that originated in Kansas, appears to be a natural choice. The original variables are retained and remain identifiable throughout the process. Colleagues, even those with little statistical background, seemed to understand the distance analogies.

There is enough freedom -- almost too much -- in the choice of functions. In the future, I will seek input in advance on the relative importance of the variables, like NCHEMS. However, this method seems fairly insensitive to changes in variable weights. This should be better understood, since the choice is a subjective feature of the process.

Faculty, staff, and trustees were kept informed about the project, which the president called the first step in understanding the college's identity and direction. We made a distinction between institutional characteristics (an aspect of identity) and performance indicators (input to direction decisions), focusing attention for the peer study on the former.

We consulted key constituencies and made the process relatively transparent. There were questions but not challenges to the choices and judgment calls inherent in the methodology. The Trustees were both surprised by and accepting of the new national peer group which did not include traditional rivals and local colleges. I provided immediate payoffs of two kinds: a "reality check" that the College was no better or worse than its peers in several key areas of concern, and some 40 key performance indicators, showing the peer group median and our rank.

The areas for future study include:

- compare "dissimilarity" to other statistical methods,
- apply the method to a different type of institution,
- explore issues of robustness.

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NEAIR 2007 CONFERENCE BEST IR REPORT/PRACTITIONER PAPER

INTERACTIVE, MULTIDIMENSIONAL NSSE DASHBOARDS SHOWING STRUCTURED MULTI-YEAR NSSE OUTCOMES: SIMPLE, UNIFORM DISPLAYS TO IMPROVE UNDERSTANDING OF COMPLEX DATA

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Abstract

"Clickable" web-dashboards, when framed by a clear education-oriented theme, can deliver meaningful, simultaneously simple (readily interpretable), balanced (coverage unbiased and wide), and comprehensive (coverage in depth) performance profiles. This workshare describes one dashboard, crafted to provide meaningful review of multidimensional, multi-year NSSE outcomes appropriate to multiple audiences.

Digital Dashboards

Dashboards hardly remain a new practice – to higher education, or to business from which they originate. Modern day multidimensional toolkits, known collectively as Business Intelligence (BI) or Data Analytics (DA), can now provide fast and readily accessible digital dashboards to multiple levels of users across large enterprises. Many feature mechanisms for "drilling down" to a customized digital dashboard – for a depth tailored by position or interest.

Although used over 20 years, dashboard indicators have become more meaningful and strategic, once organized into critical areas framed by an institution's mission. The "balanced scorecard" introduces a systematic approach for selecting such digital indicators and organizing them by theme. Together, they present to the business executive a comprehensive view that includes key operational, as well as financial, measures (Kaplan and Norton, 1992). These measures have been organized into four "perspectives" or themes: Financial; Customer; Internal Business and Innovation; and Learning.

With improvements in technology, enterprise dashboards have become increasingly adaptable. For the end user, they appear as highly customized, individual dashboards (front-end) sitting atop flexible and exceedingly fast pre-calculated slices of multidimensional data residing "somewhere" (back-end). This is all due to good planning and design by "someone" well equipped with resources, as well as forethought. Just how fast and how flexible depends only on the sophistication and the expense of what is running at the back-end. In the business world, the potential for the best in both usability and usefulness appears to have not just arrived, but to have matured nicely.

This is not always the case in the world of nonprofit education, a smaller and less affluent environment, and therefore not as targeted by commercial providers of BI. In many colleges, dashboard reporting is still often minimally structured, singularly dimensioned, and static in nature. Readers receive pre-selected subsets of indicators, key performance labels chosen by committee. Unfortunately, these indicator presentations end up often hodgepodge in nature – the case whenever the institutional dashboard is just a gathering of loosely connected sets, which in essence is a set of sets.

Multiple Years of NSSE

For six years, this institution has participated annually in the unique assessment project devised by George Kuh and colleagues at the University of Indiana. The National Survey of Student Engagement (NSSE) asks students not to rate their courses or curricula, in terms of satisfaction with various aspects. Rather, it asks that they quantify their participation in and opportunities for experiences and learning environments that are active and collaborative, enriched and challenging – to quantify, in essence, the extent that their courses and coursework "pull them in," via pedagogy and practices known for leading to deeper levels of learning. Rather than students assigning subjective satisfaction ratings to professors, courses, or programs; students respond to concrete questions about the frequency with which they encounter certain features in their educational environment, and give indication of the extent to which they participate in important activities or follow defined habits of study and academic behavior.

Not surprisingly, given its unique design, each year this national study attracts wide and varied participation. Because of this, individual institutional NSSE results can be calibrated against meaningful standards and references. This provides a means to consider – relative to other institutions – the success of an institution's investments and efforts to foster proven instructional practices. That the survey project is both nationally calibrated and comprised of behavioral metrics, rather than satisfaction ratings, makes the NSSE data a rich resource in the set of institutional-level assessment data available for self-study. The question for institutions with multiple years of NSSE data is: How best to make that resource available to a wide audience?

Desire for Comprehensive Reporting of "Full NSSE"

In earlier years, the university highlighted sets of key results for the community to consider. This year, the university has taken a new approach. The PIRA office (Planning, IR and Assessment) set out to design a set of multidimensional and interactive NSSE web-dashboards that could provide interested areas and individuals a means to examine six years of NSSE data. The dashboards would be designed to give the ability to review, in brief, the university's general trends, and also allow consideration of engagement levels (as well as other outcomes knowable from NSSE) relevant to individual areas. Therefore, at a minimum, the requirement was two separate, but clearly linked "displays." First, we needed the ability to easily review a single page set of NSSE trends displayed simply and uniformly (i.e., dashboard cells), so that quick synopses could be made of where the university stands, either relative to historical institutional development, or relative to its Carnegie peers presently. Details of the NSSE dashboard cells and formats are covered below (see Description of the NSSE web-Dashboard).

Second, one-click within each cell in a well marked area would open a bar chart display that allows identification and analysis of the extent and pattern of change historically. Users would be strongly encouraged to review these individual charts, rather than rely on the single page ('outer') display featuring only limited dashboard symbols/indicators (up, down, green, red). Dashboard simple directional flags indicate change for one year, but they reveal neither the magnitude of change, nor the duration of sustained trends. Accordingly, thorough consideration of the ('inner') chart displays would be seen as essential for an in-depth review of multi-year NSSE outcomes.

Development of the Technique

The need for a multidimensional and interactive dashboard to distribute multiyear NSSE data has motivated a well-structured and themed approach to dashboard construction. Generation of a balanced, as well as simple, synopsis of results is the key to absorbing that which is exceedingly complex. Discovery of this approach is attributed to, firstly, escape from the limited and more typical conception (within higher education), of dashboards as reporting tools useful to those for whom complexity cannot be appreciated, or for settings where, due to time or other restrictions, complexity needs to be hidden. Second, at a NEAIR 2005 Conference session, another institution shared an inexpensive and straightforward mechanism for creating an interactive web dashboard. Potentially, this type of dashboard could be used selectively, with different applications, by varying audiences (Woodward, 2005).[4]

Rather than creating simplified top-level summaries – read by time-limited executive audiences – the approach uses the simplicity of the dashboard interface to invite a wider audience than heretofore possible, giving opportunity to examine a full set of student engagement outcomes. From enterprise-level leaders whose scope of interest is wide, but whose review window is short; to individual faculty or program directors, all can access the dashboard interface via the institution's intraweb. In some instances, end-users can get a quick sense of one or more simple outcomes; and in other instances, end-users pour over the rich set of multidimensional, multiyear information, either to find details relevant to their area/interest level for comparison purposes. In addition to providing a simplified, standard dashboard (flags for one-year trends), the dashboard cell includes reference information, giving users understanding of each NSSE metric – providing benchmarks for the institution's results against those from participating Carnegie peers (or other comparison groups).

[4] Technical details of coding methods used to create these NSSE dashboards are not the focus of the workshare. Using the simplicity of a dashboard for reporting out complex data is. For readers desiring to use the same technical approach, these NSSE web-Dashboards are simply text files of html code, edited with any text editor, accessed via a web browser. The starting template for all files used here was an invaluable file generously provided by Charlotte Woodward at NEAIR in 2005. The dashboard matrix of cells is a set of inner (html coded) tables within a main outer one. The template file uses Cascading Style Sheets (CSS), a mechanism for setting then pulling from predefined styles (e.g., font size and color). Each chart display is a separate file (stored in Graphics Interchange Format i.e. a 'gif' file); these were built within Microsoft Excel 2003 and were exported to gif using ASAP Utilities, a free add-on for Excel (http://www.asap-utilities.com). Arrow indicators are also gif files. The creation of a gif file for each chart was straightforward, quick and easy. Clear, very helpful instructions on how to do this, an example Excel file, indicator gif files, and the original template html file are available from Ms. Woodward at Marywood. An example html file of the type used – that is with NSSE benchmark frames – additional comparison dimension, and dashboard key can be obtained from the author by email request (easterja@shu.edu).

The most important feature, however, is the interactive design of the dashboard that allows the ability to navigate (or drill down) to fully review multiyear details. This is the means by which the user is able to conduct a full review of the NSSE data. Upon first access, users readily see the ease in which they can analyze specific data in depth, from the large and rich set of survey data (e.g., individual NSSE items feeding into one NSSE benchmark, rather than just the NSSE benchmark score value itself). They can also examine different student contexts (e.g., senior responses versus first-year) and create other comparisons (e.g., selected areas of challenge/strength identifiable by peer institution comparison, or emerging historical trend data shown in the cells).

Similar to the "balanced scorecard", where performance indicators are organized by multiple perspectives, the NSSE web-Dashboard is a set of key institutional indicators framed by themes meaningful from the undergraduate student perspective of academic life. Added to this overarching framework is comparison of multiple years of NSSE data (dimension #2), comparison of current year values to average values from peer institutions (dimension #3), and finally, the ability to switch between dashboards containing First-Year and Senior Year data (dimension #4).

Like several pieces of the techniques shown, dashboard cells that display peer comparisons are not new. Tufts University has already displayed these types of comparison within institutional dashboards (Terkla, 2005). What is perhaps unique is offering in this simple uniform manner the extent of multiple dimensionalities. In using this themed dashboard approach, the richness inherent in multiple dimensional data, as with NSSE, can be approached by all, thus accessed and used by various constituents. This was achieved by focusing on crafting a totally uniform and very simple layout that provides a window to review in detail the multiple dimensions, where the end user is not overwhelmed by the data's complexity. The design does not hide the complexity, but rather makes it clearly visible, in which the user can understand the data and use pieces for individual research needs.

Description of the NSSE web-Dashboard

The success of this final[5] NSSE dashboard format is due primarily to two achievements in design. First, the final design is, indeed, well-structured. The overarching frame is the areas of the NSSE benchmarks themselves, an obvious framework with which to work, but still, the design turned out well (see Figure 1-a.). Most people on campus are knowledgeable about NSSE

[5] This 'final' version is actually version #4. The three versions prior were rather like *Goldilocks and the Three Bears*. The earlier versions were either too simple (attempting display using just one of the multiple comparison dimensions at a time while relying on the user to keep in mind the results of the 'other' dimension – a task found almost impossible even for those intimately familiar with the institution's NSSE results over time); or they were too complex (attempting to show everything all at once – e.g., showing as comparison values both Carnegie peer values and selected peer values in each dashboard cell). The version shared in this workshare, while perhaps still not 'just right', represents a compromise midway between the two extremes; the version #4 compromise is meeting our intended reporting out goals; and so we have deemed this version 'final' for now. Not elaborated but relevant is that the best solution we can offer at this time for considering selected as well as Carnegie peer results for inter-institutional comparisons is to make available a separate set of dashboards, and to provide another hot swap 'key' that will allow switching reference value sets.

and are familiar with the benchmark language. So, using the NSSE benchmarks as the overarching frame proved invaluable; not only did it render a dashboard in sync with the NSSE national study, but it allowed for one signposted with themes already well known by the institution. This helped new audiences for the dashboards to be more receptive.

The second best feature is the uniformity of the cell structures, content, and formatting across all 25 cells. Again, this proved key in the ability to read the dashboards. Without that quick and easy ability, the essence of what a dashboard is (i.e., a simple display of multiple statuses, readily absorbed, and integrated into a synopsis by the reader) would have been lost, and the rest would have been of inadequate value to support continuation of the project. Please refer to Figure 1-b for a labeled graphical representation that will aid the following description. Each dashboard cell contains displays of the six-year low (lower left) and the six-year high (upper left). If either of these are the current year's value, it is highlighted in yellow. In the middle of each cell is the institution's current average value, highlighted in yellow as an indicator of the latest value. To the immediate right of the current value is the directional indicator that shows the one-year directional change – up (green), down (red) or neutral (black). Further to the right is the comparison value; in the current version, it is an average value across all students at similar Carnegie-classification peer institutions who participated in 2006 NSSE. To the right of that value is a space for a symbol indicator for comparison of peer averages to the institution's current average score.

Figure 1-a: Format of a NSSE web-Dashboard

Overarching framework provided by the NSSE Benchmarks - they map to dashboard columns

Level of Academic Challenge LAC	Active and Collaborative Learning ACL	Student-Faculty Interaction SFI	Enriching Educational Experiences EEE	Supportive Campus Environment SCE
LAC Benchmark	ACL Benchmark	SFI Benchmark*	EEE Benchmark**	SCE Benchmark

5 rows of results –benchmark scores all on row 1, individual questions on rows 2 through 5

Figure 1-b: NSSE web-Dashboard key showing display legend info in each of the 25 result cells

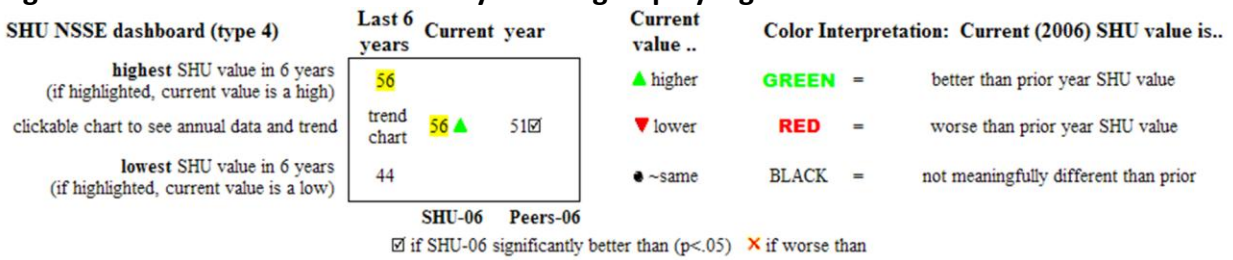
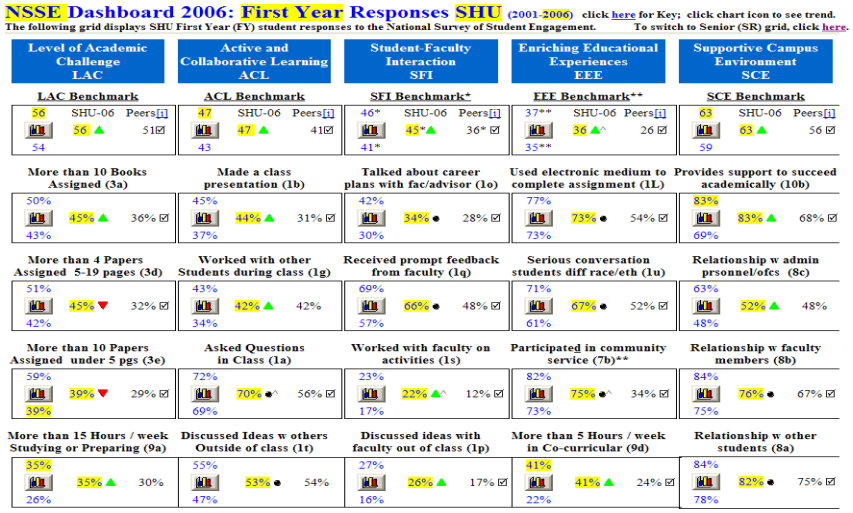


Figure 2-a illustrates a complete dashboard set of indicators – i.e., First Year student responses. Figure 2-b shows Senior Year responses. In the middle area, on the left, in each cell, is a graphic icon. Clicking on this is a hot link to a display of the trend chart for the question or benchmark. Figures 3-a and 3-b show the charts that are displayed by clicking on the icons in the senior year dashboard, column 3 (Student-Faculty Interaction, SFI), rows 1 (SFI benchmark), and 4 (SFI question 1s), respectively.

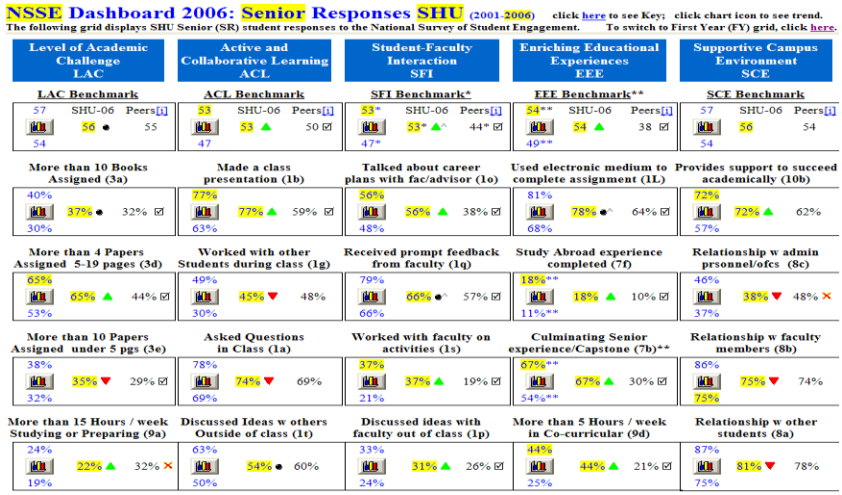
The remaining items describe the header and footer. It proved essential that we created an effective header (Figure 4) because it needed to be both unobtrusive and successful in providing a short list of hot swap keys (needed for quick access of key and other documentation, and for toggling between First Year and Senior Year results). The footer (Figure 5) contains all essential documentation of the indicator definitions. Also it provides a quick reference description of the process of selecting[6] the 20 questions from among the larger set that are distilled into the NSSE benchmarks. Additionally, the footer offers a link for a web location, listing the full set of NSSE survey questions.

Figure 2-a: NSSE web-dashboard with multiple years of First Year NSSE



(FY screen shot)

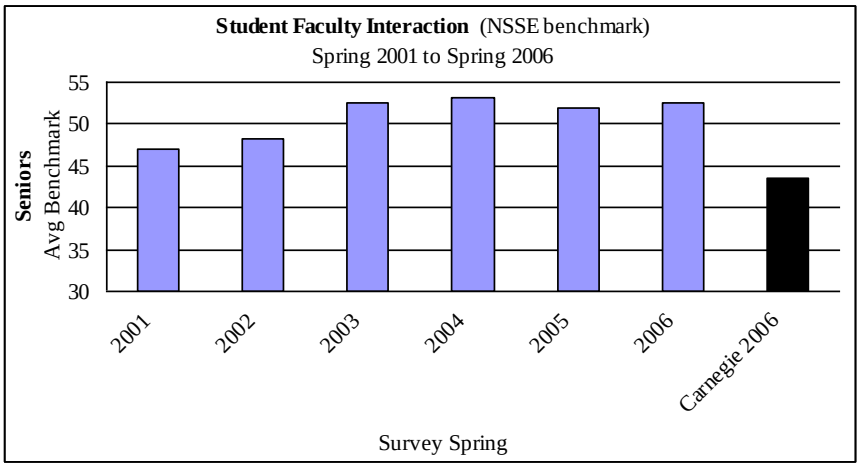
Figure 2-b: NSSE web-dashboard with multiple years of Senior Year NSSE



(SR screen shot)

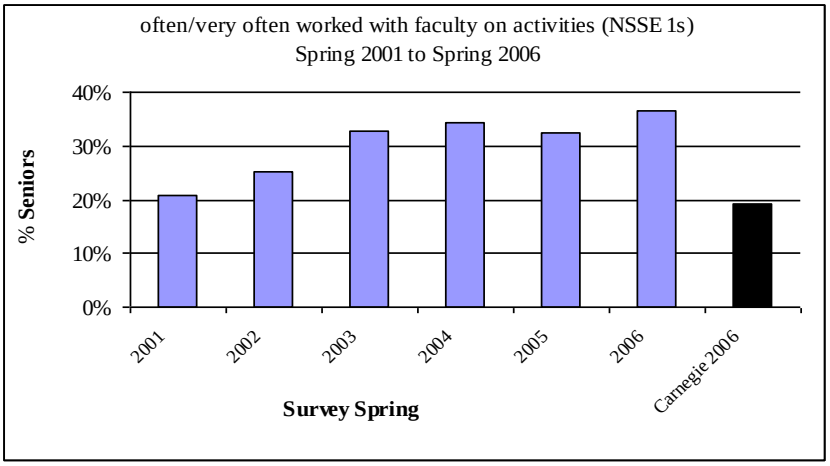
[6] NSSE benchmarks can be thought of as rescaled weighted averages of sets of related survey questions. The number of individual questions included in each NSSE benchmark varies - from a half dozen to more than a dozen. Given a practical limit of 25 dashboard cells, not all underlying benchmark questions could be included. Accordingly, it was important to the author that the rationale for how questions were chosen for inclusion in the 25 was displayed in a prominent (main page) location in the dashboard legend area.

Figure 3-a: Chart showing trend data, intra-institutional comparisons across time.



Launched via single click on graph icon in the Senior Year (SR) dashboard
Column 3 for Student-Faculty Interaction (NSSE SFI)
Row 1 for all NSSE Benchmarks

Figure 3-b: Chart showing trend data, intra-institutional comparisons across time.

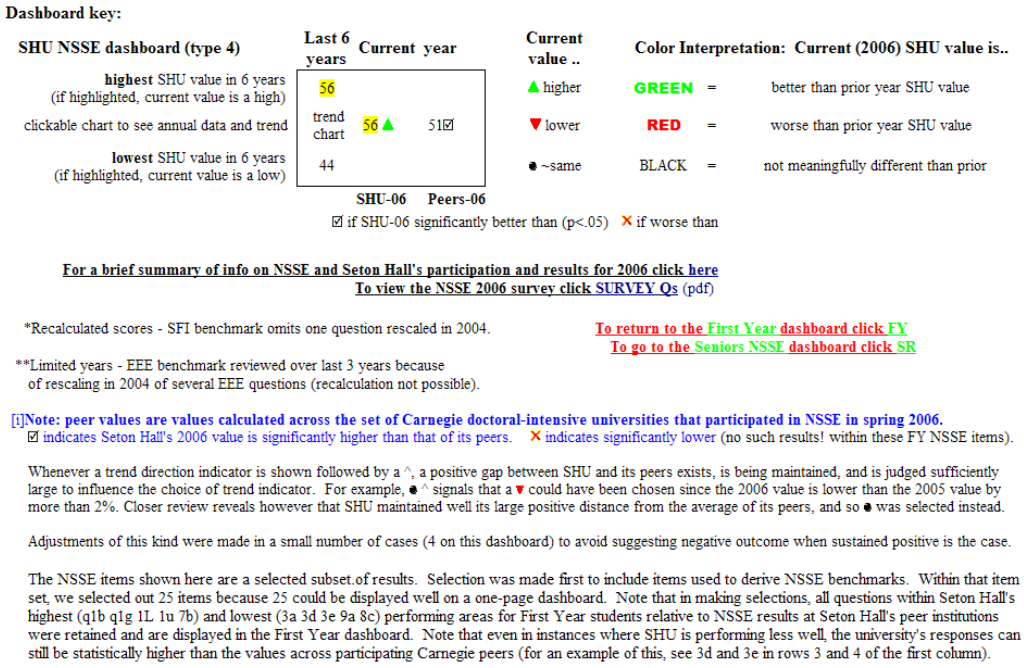


Launched via single click on graph icon in the Senior Year (SR) dashboard
Column 3 for Student-Faculty Interaction (NSSE SFI)
Row 4 for individual survey question (NSSE 1s)

Figure 4: User instructions – the header

(Screen shot showing hot swap 'keys': here and here)

Figure 5: User instructions – the footer



(Screen shot showing dashboard legend at the base)

Summary

Whether an individual area's needs are for overall historical comparisons or for institutional peer comparison, the themed approach provides multiple layers of synopsis and starting points for singular and/or multi-year reviews. This approach can actually achieve the kind of transparency spoken of in recent times by many; however, it accomplishes this without over-simplification and filtering that leads to dissatisfaction, misinterpretation, and disillusionment on both sides of the info-provider/info-consumer service function within Institutional Research.

This paper serves to document the workshare of one institution's experiences using a structured and themed approach to construct dashboards for simple access to one-topic (rather than eclectic) sets of outcomes data. In this instance, we viewed and compared multiple years of NSSE data simultaneously with peer results. In sharing this technique, we hope to show other institutions the many potential benefits in adopting this approach[7]. The "final" formats, as

[7] As this workshare is focused on demonstrating one concrete example of an interactive, multi-dimensional framed web-dashboard, other applications beyond this example are not elaborated here. However, the author notes that this approach has been applied to other arenas that are proving valuable to the institution. Examples completed or well underway where this approach (simple displays to allow for review of complex data sets) is proving useful include 1) NSSE at the college or discipline level, where comparison is made to either the institution results averaged across all disciplines at this institution or to discipline level result averaged across all institutions in NSSE in 2006; 2) Retention cohorts, where multiple cohorts are followed across multiple years as rates of persistence/departure, and vulnerable groups are compared to either institutional average rates or the rates of the opposite subgroup (e.g., male persistence compared to femail persistence); 3) General Education skills, where the frames are the skill set areas for which self-reported gains from NSSE and other surveys are known and compared over time as well as with peer institution values: and 4) US News and World Report data submitted across multiple years, where the frames are the magazines 'quality' themes, the cells show institutional values for the magazines' selected or crafted 'quality'

presented in this workshare, followed many design iterations to find a best approach for NSSE results – meaning a dashboard format useable and relevant for our institution. There were challenging trade-off continuums inherent to the process: simplicity-complexity, clarity-comprehensiveness, and usability-usefulness. The rationale for this presentation is assisting others to develop their own web-dashboard for NSSE (or other complex) data.

metrics in their annual rankings, and comparison values are the averages of these metrics across institutions in a selected benchmark comparison group used by the institution (such as across all 'Tier 2' institutions).

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ONE QUESTION/ONE ANSWER –
A METHOD FOR ORGANIZING AND ENCOURAGING STUDENT LEARNING OUTCOMES ASSESSMENT

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Abstract

Provides an overview of the process by which The College of New Jersey (TCNJ):

1) Started our formal student learning outcomes assessment initiative;
2) The framework we had in place prior to commencing;
3) Where we are now;
4) What we plan to do next;
5) Lessons learned.

Introduction

In the Fall 2005 semester The College of New Jersey (TCNJ) made an institutional commitment to the assessment of student learning outcomes within all undergraduate programs by naming a half-time Assistant Director of Assessment. This position was within the Office of Institutional Research and Assessment (OIRA), reporting through the Provost/Vice President for Academic Affairs. The creation of this position coincided with the formal commencement of the *One Question* assessment initiative. The desire of the administration was not to dictate what, when or how faculty and programs should assess student learning, but rather to allow programs to develop their own, unique assessment strategies driven by their curiosity. In this way our assessment activities would become a "means of increasing the mutual engagement of faculty members, staff, and students in providing an optimal learning experience," (Middle States, 2003, p. 6) and not just another "hoop" to jump through.

In her book *Assessing Student Learning*, Suskie (2004) defined assessment as an iterative process in which one:

1) Establishes clear, measurable expected student learning outcomes;
2) Ensures that students have sufficient opportunity to achieve these outcomes;
3) Systematically gathers, analyzes and interprets evidence that students are meeting these outcomes;
4) Uses the evidence gathered to improve student learning.

While these steps can apply to either course-level or program-level assessment, we are focused on student learning outcomes at the ***program*** level. All undergraduate programs at TCNJ had articulated their learning outcomes during a three-year curriculum transformation process completed by the Fall 2004 semester in a *Learning Goals Matrix*[8]. While creating the matrices,

[8] Sample Learning Goal Matrix:Sociology: http://www.tcnj.edu/~assess/documents/lgm/cs/SOCA_LGM.pdf

programs indicated which courses would cover which goals. Many even attempted to quantify achievement levels of the goals, such as "elementary," "intermediate" and "advanced" or "introduction," "developing" and "deep understanding." Thus, in the Fall 2005 semester, the institution was ready to start Step three (above) – systematically gathering, analyzing and interpreting evidence of program-level student learning.

A website[9] was created to store assessment documents in an easily-accessible electronic format as we embarked on our *One Question/One Answer* student learning outcomes assessment initiative. This website was designed to provide four things:

1) A source of information about resources that could be used for outcomes assessment already present at TCNJ – this included items such as an annotated list of surveys and results (internal and external), rubrics and information from the writing program, reports and summary data from institutional research[10];
2) A source of links to examples from outside TCNJ for various disciplines – for example, links to the Mathematics Association of America, American Psychological Association, Bowling Green State University, North Carolina State University, and others[11];
3) An archive of our communications about assessment – including memos, handouts from presentations, our new *Assessment Update* Newsletter[12];
4) A central repository for assessment documentation.[13]

At about the same time, the Provost charged each program to come up with one burning question concerning one learning goal. They then communicated to OIRA this question, their hypothesized outcome and the method they planned to use to assess the student learning outcome. An on-line form was created to simplify submission[14], but we also accepted email, and email attached documents (in other words, we let faculty do what they felt most comfortable doing)[15]. All forty programs submitted questions in the first year. Departments then had the remainder of the academic year to conduct their research and answer their question. At the end of the Spring semester, answers were collected in a similar manner[16]. 85% of programs submitting questions answered them (34 programs). For the first cycle, departments received very supportive feedback from OIRA. We simply encouraged them to participate, answered questions as promptly as possible and thanked them for their efforts. Types of support included assisting with the creation of alumni or current-student surveys for indirect assessment of achievement of student learning outcomes and retrieving specific student-level data from our student information system (SCT SIS+), such as course-grades in particular courses, or pattern of enrollment in sequenced courses.

Mathematics Education: http://www.tcnj.edu/~assess/documents/lgm/sci/MATT_LGM.pdf

[9] Main TCNJ Assessment website : http://www.tcnj.edu/~assess/

[10] Resources at TCNJ: http://www.tcnj.edu/~assess/tools.html

[11] Links to External Examples: http://www.tcnj.edu/~assess/links.html

[12] Archive our Communication: http://www.tcnj.edu/~assess/archives.html

[13] Central Repository: http://www.tcnj.edu/~assess/docs_amm.html

[14] One Question Submission Form: https://jedi.tcnj.edu/webteam/cgi-bin/formgenie/formgenie.pl?form=21555

[15] Use of form not required: http://www.tcnj.edu/~assess/onequestion.html

[16] One Answer Submission Form: https://jedi.tcnj.edu/webteam/cgi-bin/formgenie/formgenie.pl?form=21581

Where We Are Now

We repeated the process in the 2006-07 academic year. The format for the *One Question* was the same, but we added the requirement of articulating how the information gleaned was likely to be used by the program. Twenty-five programs, or 68% submitted questions in the second year. The three departments in the School of Engineering were exempt from participating in *One Question*, as they were undergoing their ABET reaccreditation visit. This year each department received a bit more elaborate constructive criticism of their submissions in a timely fashion from the Director of Assessment. In some cases this led to different questions being submitted (especially when questions did not relate to stated learning goals), in other cases it led to great improvement in the methodology. Overall, program faculty seemed very receptive to learning more about assessment, so we invited three outside experts to campus for faculty/staff development workshops.

The series of workshops moved from a more general overview of student learning outcomes assessment to more specific, concrete methods of assessment. The first was in mid-September of 2006 when Dr. Peter Gray, Director of Academic Assessment from the United States Naval Academy, came to campus for four presentations:

1) Formal presentation with discussion to the President's Advisory Council, entitled: "Organizational structures to sustain a culture of assessment: Are we meeting our stated mission?"
2) Formal presentation with questions at the end to the entire campus community (faculty and staff), entitled: "Assessment: making it meaningful, manageable and sustainable"
3) Two informal discussion sessions to small groups of faculty interested in the topics: "Course embedded assessments – using the capstone experience" and "Assessment in the arts and humanities (qualitative) and articulation of the results."

In late February Dr. Gloria Rogers, Associate Executive Director of Professional Services from the Accreditation Board for Engineering and Technology (ABET) joined us and presented two workshops:

1) A half-day hands-on workshop for faculty and program leaders entitled "How to Assess Program Learning Outcomes"
2) A round-table discussion entitled "Assessing Liberal Learning Outcomes"

Finally, Dr. Virginia Anderson, Professor at Towson University and self-proclaimed "classroom assessment activist," visited campus in mid-May and discussed:

1) "Introduction to Effective Grading Strategies" a workshop with activities providing time for reflection
2) "Using Grading Strategies to Enhance Grading and Save Time and Energy" a more in-depth examination of this tool
3) "Developing Assessments for Accredited Programs and Grants" a small discussion centered on assessments to examine program goals.

This last event was co-sponsored by the Faculty Senate, an important partnership to continue building the campus culture of assessment.

Next Steps

In the 2007-08 Academic Year the Director of Assessment will have more time to devote to student learning outcomes assessment, as this is now a full-time position. This will allow increased focus on the framework of six *Guiding Principles* outlined by the Middle States Commission on Higher Education (2003):

1) Campus culture of assessment;
2) Realistic plan with appropriate investment of resources;
3) Involvement of faculty and students;
4) Clear goals;
5) Appropriate methods;
6) Useful data.

Continuing to build a campus culture of assessment will be achieved by working individually and through scheduled workshops, presentations and "drop-in" hours with faculty and staff from each program. A campus-wide committee, chaired by a faculty member and including staff and students, will be formed to provide oversight of assessment activities. During this academic year, particular focus will be placed on clarifying the relationship between course- and program-level assessment (and when you can kill two birds with one stone) and moving from "learning goals" to measureable program/course outcomes with performance indicators (Rogers, 2002). In addition, an increasing focus on indications of assessment results usage will begin in the Spring semester.

Lessons Learned

After creating the learning goal matrix, and in the semester prior to asking the first *One Question* each program was asked to create a draft *Program Assessment Plan*. In retrospect I would have had most programs, specifically those not accredited by an outside agency, work on a question or two first, and then move to creating the assessment plan (and re-writing learning goals if necessary). Because most faculty were not familiar enough with program assessment, many were frustrated by this sequence, and as a result, many of our posted assessment plans are not reasonable. I would also recommend a slightly faster pace for the *One Question/One Answer* process – one question per semester. Although I anticipate there would be complaints about the workload, this would do two things:

1) give programs results from two assessments per year, which yields more to think about when using results to inform curriculum discussion and decision;
2) place a focus on small, "do-able" questions and methods, in order to keep the workload reasonable, which is what is needed for a sustainable assessment plan.

An annual informal event to share assessment results, best practices and creative solutions to common assessments efforts among faculty and staff would have been a great forum for celebrating our early efforts and creating a "buzz" around student outcomes assessment on

campus. And finally, I have learned that creating a "culture of assessment" is about conversations – it can't be done sitting at my desk in my office with bits and bytes in the ether, but must be done by participating in department meetings, having lunch with faculty and department chairs, extending personal invitations to workshops and discussions, and ultimately sharing an infectious enthusiasm for ensuring that our students are achieving our student learning outcomes.

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STUDENT OUTCOMES BY LEARNING MODE: A COMPARISON OVER TIME

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Abstract

Research comparing "Group," "Independent," or "Online" studies to more traditional, classroom-based modes of course delivery are prevalent in the field of educational research. However, very few of these studies have made direct comparisons across modes of study. Empire State College, part of State University of New York system, typically serves busy, working professionals, whose schedules do not allow for a traditional college experience. These students often require the flexibility that "Online" or "Independent" studies can provide. The purpose of this study was to examine whether differences existed in student outcomes based on the mode of course delivery over the period of one year at Empire State College.

The results of this study were consistent across terms in both the number of registrations per learning mode and student outcomes by mode of instruction. For the two terms, approximately 80% of registrations resulted in student credit, while approximately 20% resulted in "No credit." A small percentage of registrations from the two terms resulted in "Incompletes" or had not yet been assigned an outcome. Registrations classified as "Classroom" and "Group" resulted in higher percentages of student credit than registrations classified as "Online" or "Independent." While further analysis raised the possibility of a student's location being an extraneous variable, the data still strongly suggests that learning mode does have an impact on student outcomes.

Introduction

Retaining students from initial enrollment through degree completion is a challenge that plagues many post-secondary institutions. Student retention impacts institutions in numerous ways and can shape college-wide policies. Research on student retention states that multiple variables factor into a student's decision of whether or not to continue their enrollment including, pre-entry attributes, student motivation, institutional variables, experiences at the institution, and external factors such as family responsibilities, employment, etc. (Liu, Gomez, Khan, Cherng-Jyh, 2007). Within the overarching variable of "experiences at the institution" are a student's academic experiences (i.e., the successful completion of college courses for credit). While many studies have examined student learning styles and the impact of the online learning environment on student retention/course completion rates, very few have made direct comparisons across modes of study.

Empire State College was founded in 1971 as a comprehensive college within the State University of New York system. The college's mission has been, and continues to be, to serve adult students that require alternatives to the traditional schedule associated with higher

education. Today, the college has 12 centers, including 35 locations across New York State and more than 50,000 alumni. The typical Empire State College student is a busy working adult with a job, family responsibilities, and a schedule that does allow for a conventional college experience. Most students range in age from 25 to 55, study part-time, and are New York State residents.

The college provides students with the opportunity to design their own plan for meeting their educational goals, whether they are to complete a single course or attain a Master's degree. To facilitate students designing their own degree plans, the college pairs students with a faculty mentor, offers credit for prior college-level learning, and offers an array of learning opportunities through numerous modes of study, including: "Classroom," "Cross-registration," "Group," "Independent," "Online," and "Residency."

In the fall of 2006, Empire State College underwent several changes including the adoption of adoption of a five-term calendar, the development of the Learning Opportunities Inventory (LOI) and the implementation of an online registration process. The five term calendar was intended to help students better prepare for their studies, allowing sufficient time for consultation prior to registration and clear expectations concerning learning outcomes at the conclusion of their studies. Previously, registration could occur on an ongoing basis, with 48 start dates throughout the year. For reporting purposes, a course start date between July 1 and November 17, was classified as fall; November 18 and March 9, was considered spring, and any course that commenced between March 10 and June 30, was categorized as being part of the summer term.

The LOI is analogous to a course catalog, and presents learning options that are available to most students, irrespective of their regional location or affiliation. Although a variety of studies were available to students in the past, the availability of a formal repository for this information permits transparency, and increases accessibility for students who were unaware of the extent of options available to them. The online registration process is also facilitated by the availability of a term guide, which specifically identifies what studies are available in a given term. Included in both the LOI and the term guide is the ability to view studies by mode of study.

Modes of study are identified in the registration via a "credit type" code. Until Fall 2006, credit type codes were comprised of 3 or 4 characters, representing each delivery component for a given study, with the primary mode of instruction appearing first. For example, the code "INR" was used to identify independent studies with a residency component. With more than 20 codes available in the system, credit type codes were being applied inconsistently and inappropriately; and were generally confusing to faculty and students. In the fall of 2006, credit type codes were modified to broadly reflect the types of instructional modes provided by Empire State College. Table 1 displays each mode of delivery classification and the unique credit type codes that comprise them.

Table 1: Learning Mode and Credit Type	
Learning Mode	**Credit Types**
Online	DLC – Distance Learning/Classroom
	DLO – Distance Learning Online
	DLP – Distance Learning/Print Based
	DLR – Distance Learning/Residency
	OL – Online*
Independent Study	IND – Independent Study/Distance
	INE – Individualized Elective
	INF – Independent Study/Face-to-face
	INR – Independent Study/Residency
	IS – Independent Study*
Group Study	SGR – Study Group
	SG - Study Group*
Residency	RES – Residency
	RS – Residency*
Miscellaneous	FLD – Field Study
	PRE – Prepared Elective
Classroom	CLR - Classroom
	CRS – Course (exclusively Van Arsdale)
	CL – Classroom*
Cross Registrations	XRE – Cross-Registration
	XR – Cross-Registration*
Based on credit type codes identified in Fall 2005 and 2006 registrations. *Represents new codes that were implemented in 2006.	

Purpose

The purpose of this study was to determine whether differences existed concerning student outcomes based on learning mode over the period of one year. A particular focus was placed on the following learning modes: 1) Classroom, 2) Group Study, 3) Independent Study, and 4) Online.

Methodology

Registration files were extracted from the college's student database for both the fall 2005 and 2006 terms. The fall 2005 data was extracted in January 2007, while the fall 2006 data was extracted in October 2007. Both graduate and undergraduate course registrations were included. It is important to note that the data discussed in this study represents individual registrations and not individual students. For example, if a student that enrolled for three separate courses in the fall 2005, that student and their identifying information (i.e., center and unit location) would

appear three separate times in the dataset, one for each unique registration. Registrations were placed into one of seven categories based on the credit type associated with the registration: 1) Classroom, 2) Cross Registration, 3) Group Study, 4) Independent Study, 5) Miscellaneous, 6) Online, and 7) Residency. Table 2 displays course-learning modes by term.

Table 2: Learning Mode Distribution by Term

Learning Mode	2005 Fall		2006 Fall	
	N	%	N	%
Online	10,398	46.69	12,011	44.68
Independent	7,050	31.65	8,652	32.19
Group	2,456	11.03	2,459	9.15
Classroom	1,167	5.24	2,295	8.54
Residency	963	4.32	1,323	4.92
Cross Registration	141	0.63	142	0.53
Miscellaneous	97	0.44	0	0.00
Total	22,272	100	26,882	100

Along with the mode of delivery for each registration that appeared in the data set, the verified grade or outcome for each individual registration was gathered. These course outcomes were collapsed into three groups: "Credit," "No credit," and "Incomplete." No value in the verified grade field suggested that an outcome was not submitted, which resulted in a fourth group: "No Outcome." Verified grade and outcome classifications appear below in Table 3.

Table 3: Classification of Course Registration Outcomes for Fall 2005-2006

Verified Grade	Outcome Classification
A+….D-; CR; FC; MP; EP	Credit
WD; DR; NC; ZW	No credit
IN	Incomplete
Blank	No outcome

Letter grades, grades of "CR" or "Credit earned," "FC" or "Full-credit," "MP" or "Marginal pass," and "EP" or "Evaluation pending" were coded as "Credit." Outcomes such as "WD" or "Withdrawn", "DR" or "Dropped", "NC" or "No Credit", and "ZW" or "Administrative withdrawal" were coded as "No credit."

Literature Review

Liu, Gomez, Khan, and Cherng-Jyh (2007) provided an overview of existing literature on student retention models and stated that numerous factors enter into a student's decision of whether or not to discontinue their studies at an institution. They stated that an early model of student retention provided by Tinto (1975, 1982, 1987, 1988, 1997, as cited in Liu, et al., 2007)

was based on the degree to which students were integrated both academically and socially at the college. The authors reported a later model that expanded on this research proposed by Bean (1978, 1980, 1982, 1983, 1985, as cited in Liu, et al., 2007) that added environmental factors such as family responsibilities, outside support, financial situation, and employment to the equation.

Authors of studies examining adult students readily agree that the population is not a homogenous group. Adult students may range in age from 25 to 80 and differ on a number of factors including educational attainment, economic, personal, and social circumstances, as well personal and educational goals (McGivney, 2004; Hadfield, 2003; O'Donnell & Tobbell, 2007). In the last 30 years the prevalence of students over the age of 25 has increased dramatically in U.S. institutions of higher education. In 1970, there were 2.4 million undergraduate students in the United States. Those numbers increased to 4.5 million in 1980, 5.8 million in 1990, and 6 million in 2000 (43% of total undergraduates). Projections surmise that adult students will comprise more than 50% of total undergraduates in the country as soon as 2012 (Reed, 2005).

Research on adult students has shown that they face many barriers to academic success including a lack of academic preparation, financial, social, and cultural issues, family responsibilities, and learning styles incongruent with instructional styles (Spellman, 2007). Many conflicting figures exist pertaining to the retention and completion rates of non-traditional students. Horn and Carroll (1996) stated that non-traditional students were 25% less likely to obtain a degree within five years of initial enrollment. Other studies reported withdrawal/dropout rates as high as 20% to 30% (McGivney, 2004). Hadfield's (2003) research stated that as many as 40% of adult students are not retained from one semester to the next.

Any course where more than 80% of course material is delivered through a web-based application should be classified as online (Allen and Seaman, 2005, as cited in Simon, Gomez, Badrul & Cherng-Jyh, 2007). Studies over the last decade on the effectiveness of distance learning courses in comparison with traditional face-to-face instruction have produced mixed results. Chen and Jones (2007) examined a number of these studies and cited evidence where distance learning courses were found to be at least as effective as classroom courses (Jones, Moeeni & Ruby, 2005; Iverson, Colky & Cyboran, 2005, as cited in Chen & Clement, 2007) as well as studies where students in face-to-face courses outperformed those in online courses (Terry, Owens & Macy, 2001; Ponzurick, 2000, as cited in Chen & Clement, 2007). In 2007, Qiping, Chung, and Challis conducted a study comparing 2,000 students taking a section of a Master's level course. A number of students took the course online, while others enrolled in sections offered through a more traditional classroom-based approach. The authors reported that there were no significant differences in test scores between the groups.

In 2004, McGivney stated that many adult students are forced to enroll in online courses to accommodate their schedules. These students often express dissatisfaction and feelings of isolation, but see little other chance to take courses. Adult students enrolled in online courses also often report a lack of student-instructor interaction and difficulty with accessing course materials and using communicative tools (Jiang, Parent & Eastmond, 2006).

In 2007, Liu, Gomez, Khan & Cherng-Jyh provided an overview of literature on models of retention in distance education courses. They stated that this literature illustrated that student characteristics, life events, and institutional factors were all strong contributors to the retention of students in distance education courses. In 2000, Carr gathered anecdotal data from college administrators from universities across the United States that offered distance education programs and found varying results regarding course completion rates: online students completed courses at rates of 50% to 65%; course completion rates were 10% to 20% lower than traditional courses; and withdrawal rates were 9% for online courses compared with 5% in traditional courses.

Research into successful practices in distance education revealed that the most successful courses demonstrated structure and actively engaged students (Jiang, Parent & Eastmond, 2006), were taught by instructors that provided timely feedback (Vonderell, Liang & Alderman, 2007), and considered the individual needs of students, specifically computer skills, learning styles, available resources, and prior learning (Wolcott, 1996, as cited in DuCharme-Hansen& Dupin-Bryant, 2005). In 2006, Jiang, Parent & Eastmond examined students at Western Governors University, an online institution that participated in a course designed to help students navigate the perils of distance education. They reported that these students progressed at faster rates and exhibited more confidence in online courses than those students that did not take the course.

Group or collaborative learning can be defined as the mutual engagement of participants to jointly solve a problem (Dillenbourg, 1996; Rochelle and Teasley, 1995, as cited in Van Eijl, Pilot & DeVoogd, 2005). Storch (2005) stated that the foundation of group/collaborative learning is found in the social learning theory posited by Vygotsky in 1978. This theory explains that development arises through social interaction with a more able member of society, where the expert provides assistance to the novice and stretches them beyond their current levels. Research on group learning has stated that it forces participants to provide rather than simply *receive* knowledge. This more complex task requires students to activate prior knowledge and establish connections with subject matter thus providing opportunities for more "meaningful" learning (Ostwald, 1996, as cited in Gao, Shen, Losh, & Turner, 2007). Research has further stated that students have reported high levels of satisfaction with group learning, including increases in motivation and confidence, and improved relationships with peers (Van der Linden and Haenen, 1999; Lyons, 1989, as cited in Van Eijl, et al., 2005).

Research has stated that the typical format of undergraduate independent study courses allows for a student to pair with a faculty member to explore a project. The student takes a significant self-management role, while faculty members assume a role of consultant or resource person (Burke & Cummings 2002). In 2004, McGivney reported that students in independent studies may develop a feeling of isolation as they are not able to benefit from the contributions of peers from both a learning and supportive perspective. Research by Jiang, Parent, & Eastmond (2006) stated that students that have taken previous "Independent" studies tend to outperform those attempting for the first time.

Results

Chi-square analyses revealed statistically significant differences in outcomes between registrations that varied by mode of course delivery for both the fall 2005 and 2006 terms. An examination of both terms reveals that approximately eight in 10 registrations resulted in student credit, nearly two in 10 did not earn credit, and a small number of registrations resulted in "Incompletes" or "No Outcome." In both terms the learning modes with the greatest deviations from totals were "Classroom" and "Independent" studies. "Classroom" and "Group" registrations saw higher percentages of students earning credit, while "Independent" and "Online" registrations resulted in lower percentages of student credit. Complete results are depicted below in Table 4.

Table 4: Course Outcome by Mode of Delivery by Term

Term	Delivery Mode	N	% Credit	% No Credit	% Incomplete	% No Outcome
2005 Fall*	Online	10,398	79.74	20.10	0.03	0.13
	Independent	7,050	79.43	19.96	0.03	0.58
	Group	2,456	89.33	10.34	0.12	0.20
	Residency	963	81.83	16.93	0.10	1.14
	Miscellaneous	97	74.23	22.68	1.03	2.06
	Classroom	1,167	94.09	5.40	0.51	0.00
	Cross Registration	141	87.23	12.77	0.00	0.00
	Total	22,272	81.56	18.04	0.07	0.33
Term	**Delivery Mode**	**N**	**% Credit**	**% No Credit**	**% Incomplete**	**% No Outcome**
2006 Fall**	Online	12,011	76.97	22.94	0.07	0.02
	Independent	8,652	76.18	22.98	0.07	0.77
	Group	2,459	85.24	14.44	0.08	0.24
	Classroom	2,295	94.38	4.36	0.35	0.92
	Residency	1,323	82.84	16.63	0.15	0.38
	Cross Registration	142	81.69	15.49	0.00	2.82
	Total	26,882	79.27	20.24	0.10	0.39

Note: "N" represents the number of registrations, not the total number of students

*χ^2 (18, *N*=22,272) = 386.28, $p < .001$

**χ^2 (15, N=26,82) = 639.17, $p < .001$

Discussion/Conclusion

Results were consistent between terms in both numbers and percentages of total registrations offered and student outcomes by mode. Students participating in "Classroom" and "Group" studies earned credit at higher rates than those participating in "Online" and "Independent" studies for both the 2005 and 2006 fall terms. These results support existing literature stating that students prefer traditional learning environments (Benson, 2006; Terry, Owens & Macy, 2001; Ponzurick, 2000) and benefit from participating in collaborative work (Rau and Hayl, 1990, as cited in Cole & Smith, 1993; Ostwald, 1996, as cited in Gao, Shen, Losh, & Turner, 2007).

Students enrolled in "Classroom" studies earned credit at a rate of 94% for both the 2005 and 2006 fall terms. A more detailed analysis of the students that accounted for these registrations revealed that in 2005, students from the Harry Van Arsdale Center (Van Arsdale) for Labor Studies at the college accounted for two-thirds of these registrations, while students from the Center for International Programs accounted for one-third. In the fall of 2006, students from the Center for International Programs accounted for two-thirds, while students from the Van Arsdale Center accounted for the other one-third.

Unlike the rest of the college, the aforementioned centers offer prestructured programs that feature classroom studies. An examination of the center affiliation among students that accounted for "Group," "Independent," and "Online" registrations revealed a wide representation of Centers for both the 2005 and 2006 fall terms. Due to the fact that "Classroom" registrations consisted of students representing only two centers in any significant numbers and "Group," "Independent," and "Online" registrations represent students from Centers across the state, comparisons of "Classroom" outcomes with "Group," "Independent," and "Online" registration outcomes must be made with this fact in mind.

Another finding in this study was that 77% and 80% of "Online" registrations resulted in credit, while 76% and 79% of "Independent" registrations resulted in credit earned. These rates were greater than the anecdotal evidence provided by college administrators who estimated completion rates in distance education courses between 50-65% (Carr, 2000).

The registration outcomes data in this study suggest that mode of study does have an impact on student outcomes. An area of further research that exists at the college would be to examine existing literature regarding best practices in distance education courses and then to investigate the perceptions of distance education instructors and students at the college to determine whether these characteristics are present in distance education studies.

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NEAIR 2007 CONFERENCE BEST PAPER

UNDERSTANDING ADULT LEARNER PROGRAM COMPLETION

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Executive Summary

This study explores factors affecting degree completion for adult learners at a large public four-year research university. The paper uses descriptive and multivariate statistical techniques to study the factors affecting six-year degree completion for 1,269 adult students who began at Penn State University in fall 1999.

Adult learners are defined as students who are 24 years or older and/or military veterans. This is a heterogeneous group in terms of age, degree type, transfer credits, and veteran status. Other research has shown that adult learners tend to cite financial difficulties in paying tuition as a barrier to completing their degrees, so in this paper we focus especially upon issues of affordability and financial aid.

A potentially practical, addressable finding of the study is the fact that adult learners at Penn State tend to apply for both admission to the university and for financial aid later than traditional students. This is important, because it can significantly affect the amount of state grants that students receive; full-time adult students meeting deadlines typically received about twice the state aid as those who did not meet deadlines.

The study's multivariate analysis also shows substantive differences between part-time and full-time adult learners in the path to a degree. Our results indicate that income and aid received positively affect the probability of degree completion for part-time adult learners, but are not associated with increased probability of graduating for full-time adult learner students. In addition, adult students who had previously earned credits, those with higher grades during their first semester, and those who were admitted in regular (versus provisional) status also had higher probabilities of graduating.

The paper briefly compares the correlates of degree completion for adult learners and traditional-age students. Our ability to directly compare the two populations is constrained by data availability issues (in general, we have more complete information for traditional-age students) and by other substantive differences (such as the fact that adult learners are much more likely to be seeking associate degrees). Nonetheless, the differences are striking enough to reinforce an important point: namely, that extrapolating findings from access and degree-completion studies of traditional-age students to adult learner populations ignores real and significant differences between these two groups.

Introduction

This research builds on a previous study of factors related to degree completion for traditional-age students at Penn State (Dooris and Guidos, 2006). It examines some of the demographic, academic, and financial aid factors related to completion for adult students at a public four-year research university. With the shrinking pipeline of traditional-age college students, many colleges and universities are considering other markets, and adult learners represent a growing market area for many institutions. Adult enrollments in higher education nationally are projected to grow by almost 2 million students between 2000 and 2014 (U.S. Department of Education, 2005).

Adult learners have historically tended to garner more attention at community colleges than from other types of higher education institutions, but a 2005 survey sponsored by the American Council on Education found that 60 percent of all colleges and universities in the United States voice a commitment to adult students in their mission statements or strategic plans (Cook and King, 2005). Private not-for-profit four-year and public two-year schools were most likely to include adult learners in their mission, but almost half (47 percent) of public four-year schools include service to adult learners as part of their mission statement or strategic plan. Penn State's most recent strategic plan calls for actions to "address the unique needs of nontraditional students" and to aggressively recruit students from both "traditional and adult student populations" (Penn State, 2007).

Much research exists on traditional-age student persistence and completion, and some on adult learner persistence and completion at community colleges, but research on factors related to program completion for adult degree-seeking learners at four-year colleges and universities is more limited. A recent review of selected higher education journals found that only about one percent of the articles dealt with adult students (Donaldson and Townsend, 2007). Researchers partly attributed this lack of focus on adult students to the heterogeneity of the adult group and the greater convenience of studying traditional students. This creates a serious disconnect between research and informed practice. The life circumstances of adult learners differ greatly from those of traditional-age students, in terms of family responsibilities, work commitments, community interests and other factors, so extrapolating findings from research on traditional-age students is not necessarily a way to help adult learners to succeed.

In the little research that has been done on degree-seeking adult learners at four-year schools, some correlates of retention have been identified. Work conflicts and home and family responsibilities (which typically don't affect traditional-age students to the same extent) and financial difficulties in paying tuition are some reasons commonly given by adult students for dropping out of school (Wlodkowski, Mauldin, and Campbell, 2002). In one study of persistence of degree-seeking adult students, factors found to be related to academic persistence for adult learners were perceived stress, social integration, cumulative GPA, intent to persist, gender, hours employed, unmet financial need, and commuting time (Sandler, 2001). Other reviews of adult students found increased persistence related to a higher number of transfer credits, higher GPAs, being non-minority, and having greater financial aid (Wiggam, 2004; Wlodkowski, Mauldin, and Gahn, 2001). Finally, most researchers have found that retention of

undergraduate degree-seeking adult students is below that of traditional-age students (Wiggam, 2004).

Because many adult students cite cost as a factor in their attrition, adult learner knowledge and use of financial aid is a special concern of many adult learner advocates. Some feel adult students believe they are ineligible for financial aid, and one national study found one-third of adult learners were not aware that financial aid might be available to them (Pusser, et al., 2007). Nontraditional students do not always follow the time tables that traditional-age students do, applying late in the year for admission and consequently sometimes missing financial aid deadlines. These differences along with other life factors make the college experience different for adult learners. Better understanding how adult learners use financial aid and how they progress through degree completion can aid institutions in formulating practices to facilitate adult learner degree completion. Contributing to that understanding is the goal of this research.

Methodology

The dataset includes 1,269 adult students, defined as students who were 24 or older and/or military veterans, and who were first-time degree-seeking undergraduate students in the fall 1999 semester. Students in the cohort may have earned previous credits at Penn State while in non-degree status or at other universities; the fall 1999 semester was the first time they were in degree-seeking status at Penn State. The cohort included both associate and baccalaureate degree students.

Demographic indicators include age, gender, ethnicity, and veteran status. Academic indicators reflect student abilities as measured by first semester GPA, advanced standing at the time of starting a degree program, type of degree sought, and provisional status. Provisional academic status at Penn State is assigned to those students who lack adequate high school grade-point average or SAT scores that are required for regular admission. (Provisional students must attain and maintain certain minimum grade requirements to continue enrollment.) Financial indicators include 1998 family income, as reported on the Free Application for Federal Student Aid (FAFSA) for the 1999-00 academic year, the amount of federal, state, institutional, and private financial aid received, and the amount of loans received.

The study tracks this cohort through six years to determine completion rates by the start of the fall 2005 semester. Data are obtained from internal university databases, including admissions information tables, financial aid tables and graduation tables. Not all students completed the FAFSA form, from which income is available, so income amounts are available for only 852 of the students in this population.

Because degree completion is a dichotomous variable – a student either completed a degree program within six years or did not – this study uses a multivariate analysis, logistic regression, to explore the effect of demographic, academic, and financial aid factors on student degree completion. Full-time and part-time students differ vastly in their composition, with full-time students more likely to be male, minority, younger, veterans, seeking baccalaureate degrees, and applying for and receiving financial aid, so separate analyses were run for part-time and full-time students.

In addition to the analysis of degree completion, the ways in which adult learners use financial aid were of interest. Average award amounts received by adult students who submitted FAFSA forms before and after the suggested and state deadlines for awarding aid during academic year 1999-00 were calculated and compared.

Results

Full-time and part-time adult students differed in many aspects (Table 1). Part-time students tended to be older, female, non-minority, and enter Penn State with transfer credits, while a higher proportion of full-time students were veterans and baccalaureate degree-seeking.

Adult Learner Use of Financial Aid

Financial Aid during the First Year. Financial aid for adult learners is impacted by the timing of their enrollment, which does not always coincide with deadlines for financial aid applications. Adult learners tend to apply for admission and enroll for classes later than traditional-age students. Only 25 percent of part-time students in the cohort and 36 percent of full-time students had applied for admission to Penn State by February 15, 1999. In comparison, 91 percent of the more traditional-age full-time degree-seeking students had applied for admission to Penn State for the fall 1999 semester by this date.

This later entrance into the admission process may affect the submission of the FAFSA form. Penn State has two deadlines to students for submitting financial aid applications. In 1999, the first was a suggested deadline of February 15 for submission of the FAFSA form and a second deadline of May 1 in order to meet Pennsylvania financial aid award deadline. (Almost all financial aid applicants were Pennsylvania residents.)

Table 1 – Characteristics of Fall 1999 Adult Learner Cohort

			Full-time/Part-time Status			
	TOTAL		Full-time		Part-time	
	N	%	N	%	N	%
TOTAL	1269	100%	789	100%	480	100%
AGE GROUP						
Under 24	191	15%	184	23%	7	1%
24 - 29	514	41%	350	44%	164	34%
30-39	353	28%	174	22%	179	37%
40-49	178	14%	72	9%	106	22%
50 and older	33	3%	9	1%	24	5%
GENDER						
Female	650	51%	345	44%	305	64%
Male	619	49%	444	56%	175	36%

Table 1 – Characteristics of Fall 1999 Adult Learner Cohort

			Full-time/Part-time Status			
	TOTAL		Full-time		Part-time	
	N	%	N	%	N	%
MINORITY						
Unknown	68	5%	48	6%	20	4%
Minority	124	10%	97	12%	27	6%
Non-Minority	1077	85%	644	82%	433	90%
VETERAN						
Non-veteran	903	71%	475	60%	428	89%
Veteran	366	29%	314	40%	52	11%
DEGREE TYPE						
Associate	522	41%	280	35%	242	50%
Baccalaureate	747	59%	509	65%	238	50%
PROVISIONAL STATUS						
Regular	994	78%	616	78%	378	79%
Provisional	275	22%	173	22%	102	21%
STANDING						
Advanced Standing	571	45%	311	39%	260	54%
First Year	698	55%	478	61%	220	46%

Most adult students did not meet the suggested February deadline. Only 8 percent of the part-time students and 21 percent of the full-time students who submitted FAFSA applications did so before February 15, 1999. (This compares to 17 percent of the traditional-age full-time students who had submitted by the February deadline.) Full-time adult students who met the suggested deadline received more state aid and used fewer loans in their first year at Penn State. Full-time adult students who submitted their FAFSA by February 15 received an average of $400 more than those who did not and also used about $400 less in loans, on average. While whether full-time students met the application deadline did relate to the amount of state aid they received, we did not find similar substantive differences on this dimension for total federal, institutional, or private aid, or for part-time students.

Almost half (47 percent) of the part-time students and 72 percent of the full-time students applying for aid submitted their FAFSA by May 1, 1999. (These percentages include the students who submitted before the February deadline and are much lower than the 93 percent of the students in the traditional cohort who applied for aid before May 1.) We reviewed the amount of federal, state, institutional and private aid to determine whether meeting the deadline made a difference in the amount of aid received. The only significant difference was found in the amount of 1999-00 state aid received. Both part-time and full-time applicants who submitted their FAFSA forms before May 1, 1999 received awards almost twice the amount received by applicants submitting their forms after the deadline. Full-time students who submitted their application before May 1 received on average, about $1,100 more than those submitting after the deadline. For part-time students, the average awards were about $500 more for those submitting

before the deadline. No significant difference existed in the amount of total federal aid, total institutional aid, or loan amounts between those students who met the FAFSA submission deadline and those who did not.

Financial Aid Received over Six Years. Financial aid was used more by full-time adult students than part-time students during the six years covered by this study. About 80 percent of full-time students applied for and received some form of financial aid at some point during the six years. This compares to only 59 percent of part-time students. Full-time students received about double the amount of grants and scholarships that part-time students did, but had about equal loan debt loads as part-time students at the end of the six years. These differences are most likely due to state and federal financial aid policies, which have lower maximum amounts of grant aid for students enrolled part-time, but equal maximums amounts on loans for part-time and full-time students.

Completion Rates

As noted, within six years of starting in a degree status, 54 percent of full-time and 51 percent of part-time adult learners entering in fall 2006 completed associate or baccalaureate degrees. As an approximate point of comparison, we know from an earlier study (Dooris and Guidos, 2006) that 66 percent of traditional-age students who entered in that fall 1999 semester completed baccalaureate degrees within six years (please note that this 2006 study looked only at baccalaureate degree completion).

Overall, adult students who were admitted to the University on a provisional basis (meaning that they did not satisfy the standards for admission to a degree program) had the lowest graduation rates among returning adults. Adult students with previous credits had higher graduation rates than other adult learners. Females and males graduated at about the same rate, as did minority and non-minority students, while veterans were slightly less likely to graduate. Adult learners who began as full-time students seeking baccalaureate degrees had the highest completion rates of all adult learners. Almost two-thirds (63 percent) of these adult students completed degrees within six years.

The heterogeneity of adult learners compelled us to use a multivariate analysis to examine degree completion and to use separate analyses for full-time and part-time students (please see Tables 2 and 3.) The logistic regression model included eleven variables: age in years, gender (male or female), minority status (minority or non-minority), type of degree (associate or baccalaureate), provisional status (provisional or regular), standing (first-time or advanced), fall 1999 grade point average (0.00-4.00), 1998 family income in ten thousands as reported on the FAFSA, the amount of total financial aid received in 1999-00 in thousands, and the total amount of loans received in 1999-00 in thousands.

Both models fit the data well, with the model for part-time students being somewhat better able to explain degree completion. The model chi-squares for each model were significant and each was able to correctly classify about 80 percent of the observed cases as indicated by the levels of concordance. The Nagelkerke R^2 was slightly higher for the part-time student model,

indicating that the independent variables were able to explain about 35 percent of the variation in the dependent variable.

Table 2 - Logistic Regression Results for Fall 1999 **Part-time** Adult Learners (N=230)			
Variable	Coefficient	Wald χ^2	Odds Ratio
Age	0.000857	0.0016	1.001
Gender (female = 0)	-0.3093	0.6877	0.734
Minority Status (minority = 0)	-0.3617	0.2807	0.697
Veteran Status (veteran = 0)	0.4737	0.7584	1.606
Degree Type (associate = 0)	-0.8025*	4.8684	0.448
Provisional Status (provisional = 0)	0.2857	0.4670	1.331
Standing (first-time = 0)	1.1482**	8.9442	3.152
Fall 1999 GPA (0.00 – 4.00)	0.4549*	5.8569	1.576
1998 Income (in S10,000s)	0.000023**	6.5904	1.263
1999-00 Total Financial Aid in Gifts (in S1,000s)	0.000198	3.5588	1.219
1999-00 Total Financial Aid in Loans (in S1,000s)	0.000188***	12.9187	1.207
Model χ^2 = 71.1935 ***			* p<.05
d.f. = 11			** p<.01
Nagelkerke R^2 =0.3550			*** p<.001
Concordant (predicted to observed) = 80.4%			

Table 3 - Logistic Regression Results for Fall 1999 **Full-time** Adult Learners (N=583)			
Variable	Coefficient	Wald χ^2	Odds Ratio
Age	-0.0179	1.1752	0.982
Gender (female = 0)	0.2004	0.8634	1.222
Minority Status (minority = 0)	-0.0516	0.0230	0.950
Veteran Status (veteran = 0)	0.4270	2.7445	1.533
Degree Type (associate = 0)	0.00239	9.8182	1.002
Provisional Status (provisional = 0)	0.9073***	10.0958	2.478
Standing (first-time = 0)	0.9837***	16.4666	2.674
Fall 1999 GPA (0.00 – 4.00)	0.9939***	64.2162	2.702
1998 Income (in S10,000s)	0.0000025	1.5717	1.026
1999-00 Total Financial Aid in Gifts (in S1,000s)	0.000045	2.1122	1.046
1999-00 Total Financial Aid in Loans (in S1,000s)	0.000023	0.4634	1.023
Model χ^2 = 160.7229 ***			* p<.05
d.f. = 11			** p<.01
Nagelkerke R^2 =0.3213			*** p<.001
Concordant (predicted to observed) = 77.9%			

Our interpretation of the logistic regression results in Table 2 and Table 3 rests primarily on the odds ratio, partly because it can be explained fairly readily to non-institutional research audiences. The odds ratio represents the change in the odds of degree completion resulting from a one-unit change in the independent variable. Ratios which are greater than one indicate a positive relationship; as the value of the independent variable increases, the odds of degree completion also increase. For example, the odds ratio of 1.576 for GPA for part-time students suggests that for every one-unit increase in GPA, the odds of degree completion increase by 57.6 percent. For the specific case of categorical variables of two dimensions used in this analysis, the odds ratio represents the difference in the odds ratio between the two groups when the groups are coded as 0 and 1. For example, for part-time students, the odds ratio of 3.152 for standing indicates that the odds of graduating for students with advanced standing (coded as 1) are 215 percent higher than the odds for first-time students (coded as 0).

For part-time adult students, higher grades earned in the first fall semester, being in an advanced standing with credits already earned, and seeking an associate degree were all related to higher odds of completing degrees. The effect of advanced standing and seeking a baccalaureate degree were similar; the odds of part-time baccalaureate degree-seeking adult students completing degrees within six years were about 55 percent lower than those seeking associate degrees, while the odds of those with prior earned credits were 215 percent higher than for students with no prior credits. In addition, higher income and greater loan amounts were associated with higher odds of degree completion. Every $1,000 increase in family income raised the odds of completing a degree by 26 percent and every $1,000 increase in loans increased the odds by 21 percent.

For full-time adult students, students earning higher grades in fall 1999, having previous credits, and being in a regular academic status had higher odds of graduating. Regular non-provisional students had 148 percent greater odds of graduating, and those with prior credits had 170 percent greater odds of graduating. Total family income and the amount of financial aid received as grants and loans did not play a role for full-time adult students. Compared to part-time adult students, GPA had a slightly lesser effect on the odds of full-time adult students graduating. Every one-point increase in GPA raised the odds of graduating by 170 percent. This is somewhat lower than the 215 percent increase found for part-time adult students.

Comparing Adult and Traditional-Age Students

As noted, an earlier paper examined access and affordability issues for over 5,000 traditional-age Penn State students who entered at the same time as the adult learners studied in detail in this report.

Our ability to directly compare the correlates of degree completion for adult learners and traditional-age students is constrained by three types of complications. First are simple data availability issues; in general, we have more complete information in the university's databases for traditional-age students. Second, because Penn State's population of traditional-age students is so large, one might expect that statistically significant results would be indicated for many more variables for that population; that in fact turns out to be the case. Third are more subtle considerations, such as the fact that – as a practical matter – a study of degree completion for

traditional-age Penn State students is a study of baccalaureate degree completion; the adult learner population includes both associate degree and baccalaureate degree students. In short, for a variety of reasons, the ability to run clean, parallel multivariate analyses across these populations is somewhat constrained. Still, with those caveats in mind, it is revealing to compare the findings of the current analysis of adult students with a similar study (Dooris and Guidos, 2006) carried out for traditional-age students.

The statistically significant correlates for part-time adult learners and the relationship (positive or negative) to degree completion are as follows:

- Degree type: negative for baccalaureate degrees
- Standing (that is, does the student enter with some credits already earned?): positive for students with previous credits earned
- First-semester GPA: positive
- 1998 income: positive
- 1999-00 total financial aid in loans: positive

The significant correlates for full-time adult learners and the relationship (positive or negative) to degree completion are as follows:

- Provisional status (meaning that student was not initially qualified for admission to a regular, degree granting program): negative
- Standing (that is, does student enter with some credits already earned): positive for students with previous credits earned
- First-semester GPA: positive

The significant correlates for traditional-age students and the relationship (positive or negative) to degree completion are as follows:

- First-generation (neither parent had some college): negative
- On-campus (student lives in a residence hall): positive
- First-semester GPA: positive
- Predicted GPA (based on SAT scores and high school GPA): positive
- Residency (in-state or out-of-state): positive for out-of-state
- 1998 income: positive
- Number of majors (that is, whether the student changed majors over the six year period): positive
- Student self-rating of test-taking preparation on entering freshmen survey: positive

As noted, in part these findings are analytic artifacts that reflect the vastly different sizes and structures of the respective populations. However, we believe that these findings also have a basis in real-world differences – such as the realities of work, home, and family responsibilities – between these fundamentally different groups of students. The findings illustrate the risks in extrapolating ideas about access and degree-completion from one type of student to another. In short, efforts to help full-time traditional-age baccalaureate students, part-time adult learners, and

full-time adult learners should be based on the realization that these groups face different challenges on the path to degree completion.

Conclusions

This paper has examined adult learner use of financial aid and factors associated with completion of degree programs. Although adult learners cite financial concerns as affecting their ability to continue their education, many adult students, especially part-time students, fail to apply for aid. And when nontraditional students don't adhere to suggested admission and application deadlines, the amount of financial aid they receive is affected. This is important information for admissions staff to realize when marketing to and accepting adult students.

Knowing some of the factors associated with degree completion can aid admissions staff by helping adult students recognize some of the barriers they may face. For instance, although about half of both full-time and part-time adult students completed degrees within six years, provisional students (those who entered without adequate college preparation for admission to a degree program) had the lowest odds of graduating. Also, obtaining loans seems to be a strategy used successfully by many part-time adult students to finance their education, resulting in higher odds of degree completion.

Future research can build on these findings by using survey research, more detailed advising information, and student interviews to identify other variables linked to degree completion. Information on marital status for adult students, specific employer tuition reimbursement patterns, and employment factors could be incorporated into more detailed multivariate analysis to tease out the effects of these other factors.

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A VALIDITY TEST OF FINANCIAL AID LOGISTIC MODEL IN PREDICTING STUDENT RETENTION

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Abstract

A previous study on 2005 cohort revealed that several financial aid variables – along with SAT math, high school GPA, and first semester GPA – are good predictors of second semester or second year retention. This study examines how well the predicting models are doing in predicting retention of a later cohort.

Objectives of the Research

Due to a decline in freshman retention, a retention committee was formed at our campus to find out what can be done in order to retain more students. We were called upon to do different analyses to find out what mattered the most. From our exploratory analyses, we know that unmet need is probably the most important financial aid factor that influences freshmen retention. Other factors that influence retention include the student's high school GPA, SAT scores, first semester GPA, whether the individual is living on campus or not, campus ministry participation, etc.

With previous study on the Fall 2005 cohort, I was able to build several logistic regression models, which were significant in predicting the freshman retention. With the prediction models from the Fall 2005 cohort, we were able to predict the retention of the Fall 2006 cohort once the financial aid data became available.

From the study, we know that unmet need, loan amount, total financial aid, and SAT math scores are the best predictors of second semester retention. Unmet need, loan amount, total financial aid, and high school GPA are good predictors of the second year retention. In addition, unmet need, loan amount, total financial aid, and first semester GPA are also good predictors of second year retention.

This study is intended to use the models to predict the retention status of a later cohort, that is the Fall 2006 cohort, and evaluate how well the models are doing in a different cohort. Table 1 shows the models tested in Fall 2005 cohort and Table 2 shows the models used in the validity test using Fall 2006 cohort.

Logistic Regression Models Tested in Fall 2005 Cohort

Table 1

Model 1

1a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need and Total Aid Amount

	Beta Coefficient	P-value
Unmet Need	-0.0301	0.0180*
Total Aid Amount	0.0801	0.0009***

* p<=.05;** p<=.01; *** p<=.001

1b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need and Total Aid Amount

	Beta Coefficient	P-value
Unmet Need	-0.0268	0.0013**
Total Aid Amount	0.0196	0.0684

* p<=.05;** p<=.01; *** p<=.001

Model 2

2a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Family Income, and Loan Amount

	Beta Coefficient	P-value
Unmet Need	-0.4056	<.0001***
Total Aid Amount	0.7141	<.0001***
Family Income	0.00105	0.8397
Loan Amount	-0.00065	<.0001***

* p<=.05;** p<=.01; *** p<=.001

2b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Family Income, and Loan Amount

	Beta Coefficient	P-value
Unmet Need	-0.1134	<.0001***
Total Aid Amount	0.1516	<.0001***
Family Income	0.00252	0.2888
Loan Amount	-0.00016	<.0001***

* p<=.05;** p<=.01; *** p<=.001

Model 3

3a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Family Income, Loan Amount, and Grant and Scholarship Amount

	Beta Coefficient	P-value
Unmet Need	-0.3275	0.0011*
Total Aid Amount	0.9716	<.0001***
Family Income	0.00128	0.8192
Loan Amount	-0.00091	<.0001***
Grant and Scholarship Amount	-0.00041	0.0047**

* p<=.05;** p<=.01; *** p<=.001

3b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Family Income, Loan Amount, and Grant and Scholarship Amount

	Beta Coefficient	P-value
Unmet Need	-0.1005	0.0007***
Total Aid Amount	0.1926	<.0001***
Family Income	0.00234	0.3265
Loan Amount	-0.00020	<.0001***
Grant and Scholarship Amount	-0.00007	0.2185

* p<=.05;** p<=.01; *** p<=.001

Model 4

4a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Family Income, Loan Amount, Grant and Scholarship Amount, and Work Study Amount

	Beta Coefficient	P-value
Unmet Need	-0.3240	0.1275
Total Aid Amount	0.7524	0.0119*
Family Income	0.00155	0.9585
Loan Amount	-0.00070	0.0119*
Grant and Scholarship Amount	-0.00014	0.6715
Work Study Amount	0.00163	0.2586

* p<=.05;** p<=.01; *** p<=.001

4b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Family Income, Loan Amount, Grant and Scholarship Amount, and Work Study Amount

	Beta Coefficient	P-value
Unmet Need	-0.1547	0.0037**
Total Aid Amount	0.0986	0.1056
Family Income	0.00362	0.6109
Loan Amount	-0.00013	0.0197*
Grant and Scholarship Amount	0.000002085	0.9797
Work Study Amount	0.000609	0.2424

* p<=.05;** p<=.01; *** p<=.001

Model 5

5a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and High School GPA

	Beta Coefficient	P-value
Unmet Need	-0.3783	<.0001***
Total Aid Amount	0.7317	<.0001***
Loan Amount	-0.00063	<.0001***
High School GPA	-1.8248	0.0722

* p<=.05;** p<=.01; *** p<=.001

5b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and High School GPA

	Beta Coefficient	P-value
Unmet Need	-0.1129	<.0001***
Total Aid Amount	0.1152	<.0001***
Loan Amount	-0.00012	<.0001***
High School GPA	0.9024	0.0013**

* p<=.05;** p<=.01; *** p<=.001

Model 6

6a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, SAT Math, and SAT Verbal Scores

	Beta Coefficient	P-value
Unmet Need	-0.7339	0.0062**
Total Aid Amount	1.8521	0.0067**
Loan Amount	-0.00155	0.0062**
SAT Math	-0.0351	0.0227*
SAT Verbal	-0.0185	0.0852

* p<=.05;** p<=.01; *** p<=.001

6b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, SAT Math, and SAT Verbal Scores

	Beta Coefficient	P-value
Unmet Need	-0.1106	<.0001***
Total Aid Amount	0.1290	<.0001***
Loan Amount	-0.00013	<.0001***
SAT Math	0.00349	0.1152
SAT Verbal	-0.00148	0.4764

* p<=.05;** p<=.01; *** p<=.001

Model 7

7a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, Father's Educational Level, and Mother's Educational Level

	Beta Coefficient	P-value
Unmet Need	-0.4699	<.0001***
Total Aid Amount	0.7527	<.0001***
Loan Amount	-0.00069	<.0001***
Father's Educational level	-0.8269	0.4789
Mother's Educational level	-0.5814	0.5643

* p<=.05;** p<=.01; *** p<=.001

7b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, Father's Educational Level, and Mother's Educational Level

	Beta Coefficient	P-value
Unmet Need	-0.1280	<.0001***
Total Aid Amount	0.1481	<.0001***
Loan Amount	-0.00016	<.0001***
Father's Educational level	0.1095	0.6862
Mother's Educational level	0.4100	0.1353

* p<=.05;** p<=.01; *** p<=.001

Model 8

8a: Logistic Regression Results: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and first semester GPA

	Beta Coefficient	P-value
Unmet Need	-0.3677	<.0001***
Total Aid Amount	0.6851	<.0001***
Loan Amount	-0.00058	<.0001***
First Semester GPA	-0.2053	0.6524

* p<=.05;** p<=.01; *** p<=.001

8b: Logistic Regression Results: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and first semester GPA

	Beta Coefficient	P-value
Unmet Need	-0.1102	<.0001***
Total Aid Amount	0.1161	<.0001***
Loan Amount	-0.00012	<.0001***
First Semester GPA	0.6601	<.0001***

* p<=.05;** p<=.01; *** p<=.001

Models Used for Validity Test in Fall 2006 Cohort

Table 2

Model 1

Logistic Regression: Predicting Freshman Second Semester Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and SAT Math

	Beta Coefficient	P-value
Unmet Need (in thousand)	-0.6806	0.0021**
Total Aid Amount (in thousand)	1.6041	0.0025**
Loan Amount	-0.00139	0.0022**
SAT Math	-0.0378	0.0082**

* p<=.05;** p<=.01; *** p<=.001

Model 2

Logistic Regression: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and High School GPA

	Beta Coefficient	P-value
Unmet Need (in thousand)	-0.1129	<.0001***
Total Aid Amount (in thousand)	0.1152	<.0001***
Loan Amount	-0.00012	<.0001***
High School GPA	0.9024	0.0013**

* p<=.05;** p<=.01; *** p<=.001

Model 3

Logistic Regression: Predicting Freshman Second Year Retention
Independent Variables: Unmet Need, Total Aid Amount, Loan Amount, and First Semester GPA

	Beta Coefficient	P-value
Unmet Need (in thousand)	-0.1102	<.0001***
Total Aid Amount (in thousand)	0.1161	<.0001***
Loan Amount	-0.00012	<.0001***
First Semester GPA	0.6601	<.0001***

* p<=.05;** p<=.01; *** p<=.001

Literature Review

According to Tierney (1980), lower-income students are generally more sensitive to the issue of tuition than upper-income groups. Minorities often avoid loans and when loans are used, persistence can be negatively impacted; and a higher portion of students with gift aid only packages persisted the following year (Fenske, Porter, and DuBrook, 2000). Reliance on loans to finance undergraduate education may produce detrimental effects on student retention (Mulugetta, Saleh, and Mulugetta, 1997). Students often reevaluate their decision of college choice. If post matriculation reevaluations of the benefits and costs of attendance are consistent with their earlier perceptions, students are likely to view their implicit contract as inviolate and decide to persist at that college. On the other hand, if students' subsequent experience and perceptions of the benefits and costs of attendance compare unfavorably with their prematriculaiton expectations, there is a greater chance that they will decide to leave (Paulsen and St. John, 1997). All the articles suggested that unmet need and loans are the major financial aid factors influencing student retention.

Summary of the Methodology

Logistic regression modeling was performed using the Fall 2005 cohort data. Although many models were explored, only three models were selected to be the best models for predicting freshman retention. The first model uses unmet need, total aid amount, total loan amount and SAT math scores to predict second semester retention. The second model uses unmet need, total aid amount, total loan amount, and high school GPA to predict second year retention. The third model uses unmet need, total aid amount, total loan amount, and first semester GPA to predict second year retention. The probability of student retention based on the predicting variables was calculated using a later cohort (Fall 2006 cohort). When I compared the prediction with the actual enrollment during Spring semester of 2007 for Model 1 about 80% of the predictions were accurate. When comparing the prediction with the actual enrollment during Fall semester of 2007 for Models 2 and 3, the accuracy rates are 70% and 71% respectively. Table 3 shows the frequency table and the percentage of the accurate prediction.

Table 3

Model 1

		Prediction		
		leave	stay	Accurate Rate
Actual	leave	15	21	79%
	stay	163	658	

Model 2

		Prediction		
		leave	stay	Accurate Rate
Actual	leave	46	110	70%
	stay	148	553	

Model 3

		Prediction		
		leave	stay	Accurate Rate
Actual	leave	49	107	71%
	stay	141	560	

Summary of the Data Sources

The enrollment data are used to identify the Fall 2006 cohort. In addition, the Spring 2007 enrollment data was examined for second semester retention. Fall 2007 enrollment data will be examined for second year retention as well, once the data become available. Financial aid data as well as first semester GPA information from Peoplesoft system were extracted. In addition, high school GPA and SAT scores were also extracted for analysis. Based on the data, the probability of student retention according to the logistic regression models in the second semester and the second year was calculated. Compared with the actual enrollment, the percentages of the accuracy of the prediction were calculated.

Summary of the Results

The Logistic Regression showed that the unmet need amount is the single most important factor that impacts fall freshman retention in the following spring semester and sophomore year. Other factors tested were whether the student has a loan (loans) or not, the amount of loan(s), total financial amount, family income, the amount of grant and scholarship money, the amount of work-study. In addition, non-financial aid variables were also examined, such as SAT math score, SAT verbal score, mother's educational level, father's educational level, high school GPA, first semester GPA, whether the individual is living on campus or not, and campus ministry participation, etc. From testing of models with different variables, we know that while unmet need is almost always statistically significant, total aid amount and loan amounts are also important for freshman retention. When financial aid variables were accounted for in the model, most of the variables other than financial aid were not significant with the exception of first semester GPA (highly significant in predicting second year retention), high school GPA (significant in predicting second year retention), and SAT math scores (significant in predicting second semester retention).

For the second semester retention, the model with Unmet need, Total aid amount, Loan amount, and SAT Math as independent variables, 79% of the predictions were accurate. In addition, for the second year retention, the model with Unmet need, Total aid amount, Loan amount, and High school GPA as independent variables, the accuracy of the prediction was 70%. In addition, the third model with Unmet need, Total aid amount, Loan amount, and First semester GPA to predict Second Year Retention, the accuracy rate of prediction is 71%. Table 3 shows the frequency of the correct and incorrect prediction as well as the accuracy rate. The group I correctly predicted to retain generally has the highest high school academic quality (Figures 1-3). However, the group that I correctly predicted to leave does not necessarily have the lowest academic quality. Figure 1 showed that among the four different groups, the group I correctly predicted would leave actually has the highest SAT verbal scores. It might suggest that the students who drop out really early during the semester do so, not because they are not capable academically, but because they are academically capable and find a better fit at another University. When comparing first semester GPA, the group that I correctly predicted would retain always has the highest first semester GPA, while the group that I correctly predicted would leave always has the lowest GPA (see Figures 4-6). While looking at the two incorrect prediction groups in the financial aid factors, it is possible that the high total amount of financial

aid might have play a role in causing the students to drop out (please see Figures 7-9). Meanwhile, the group that I correctly predicted would retain always has the lowest unmet need.

Figure 1
Model 1

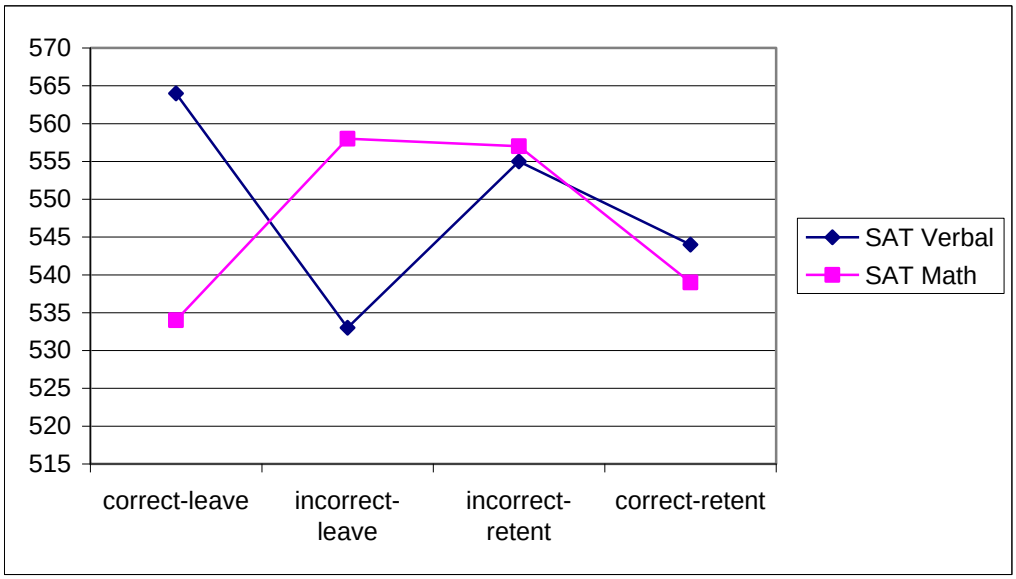


Figure 2
Model 2

Figure 3
Model 3

Figure 4
Model 1

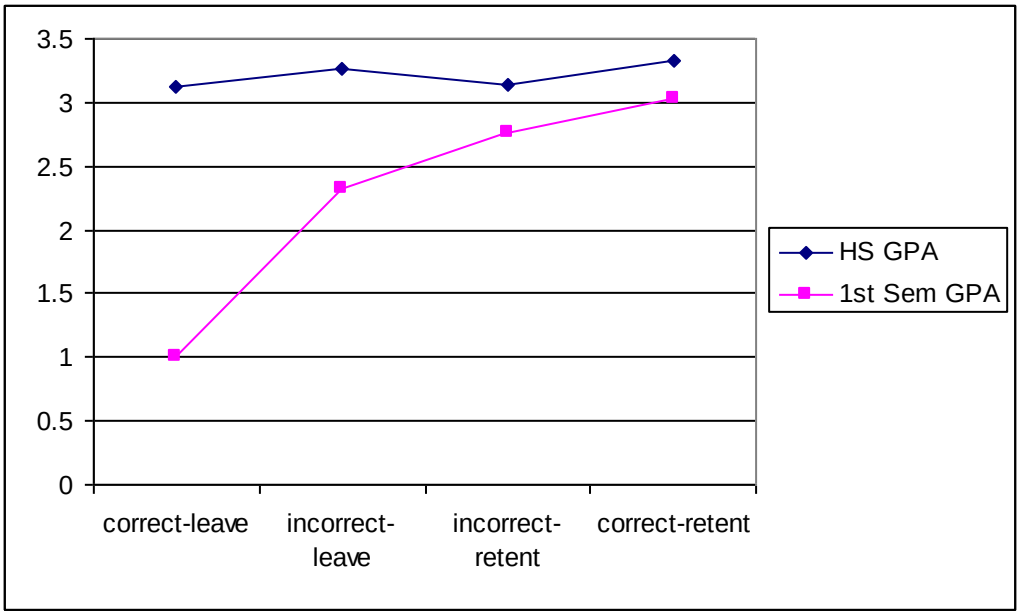


Figure 5
Model 2

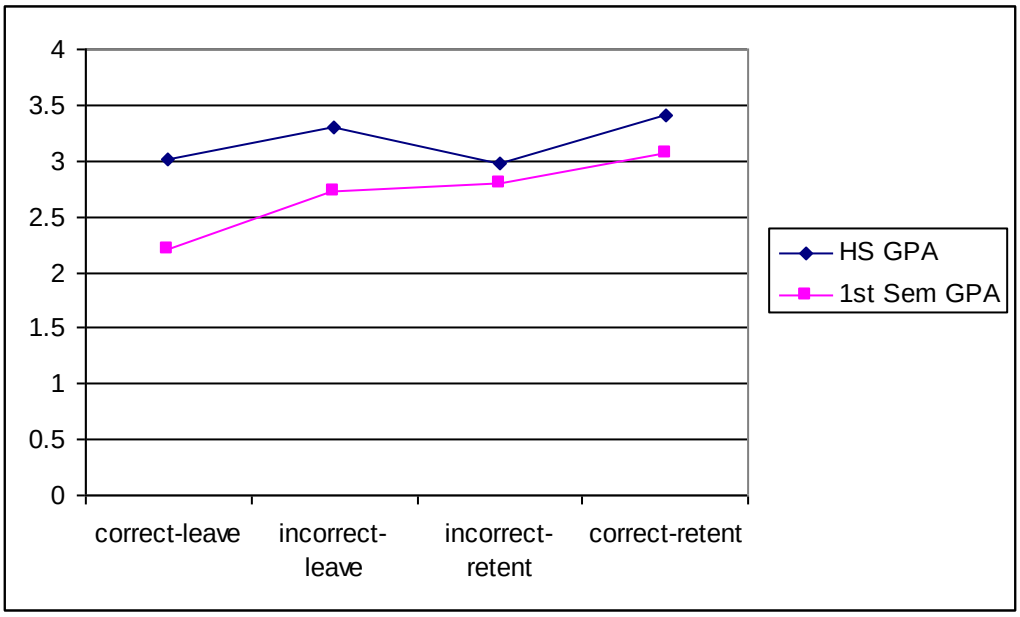


Figure 6
Model 3

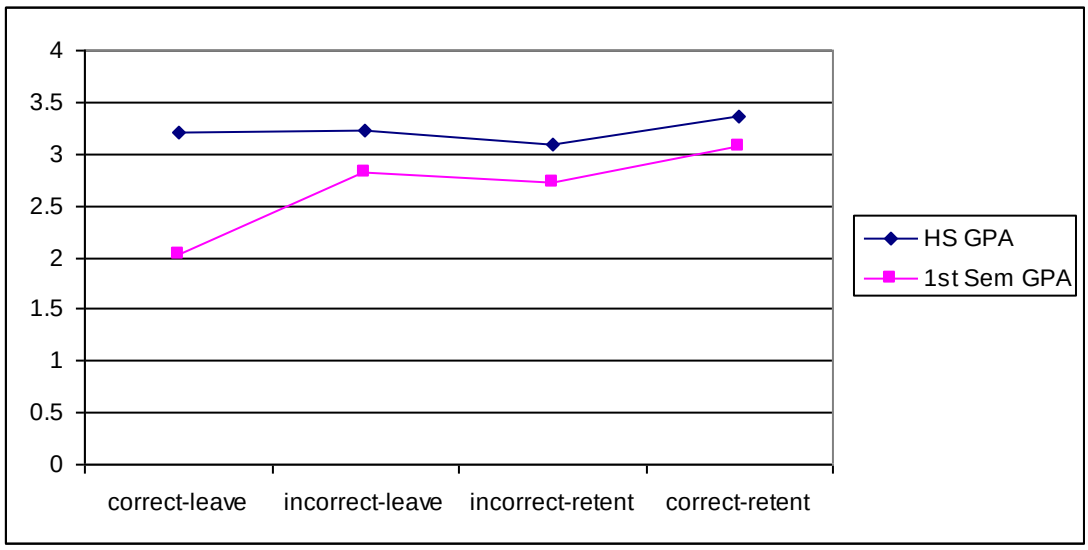


Figure 7
Model 1

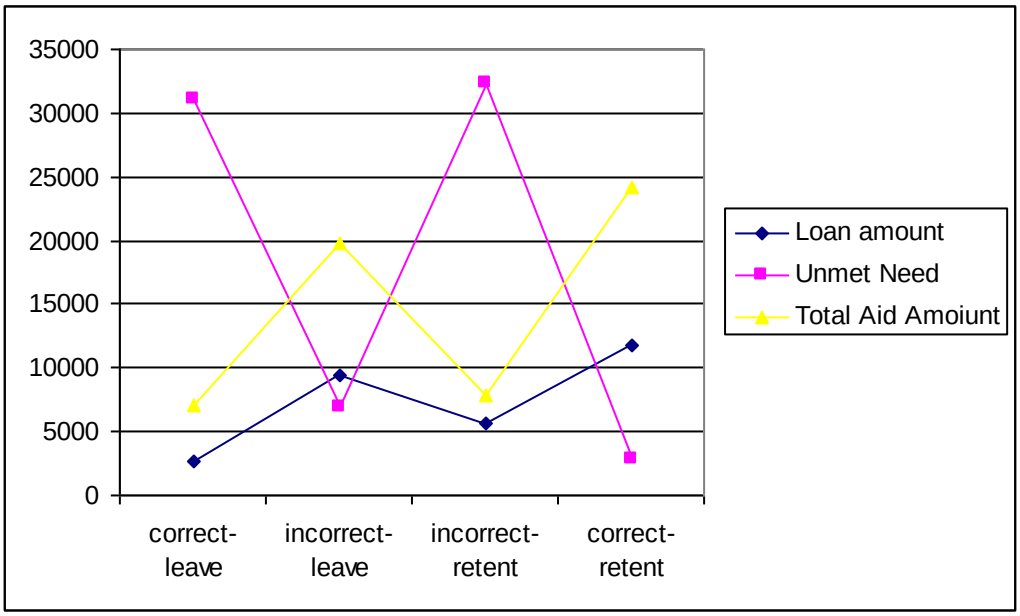


Figure 8
Model 2

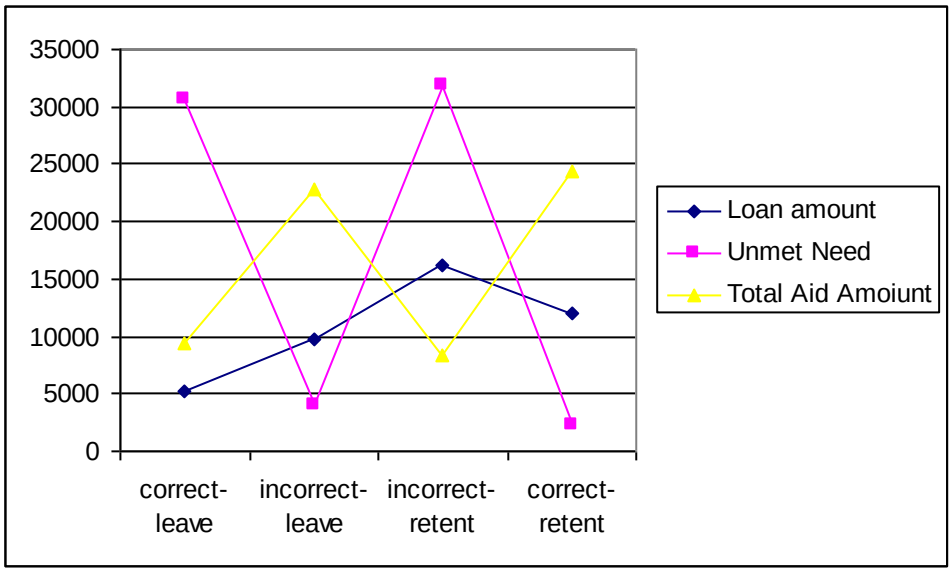
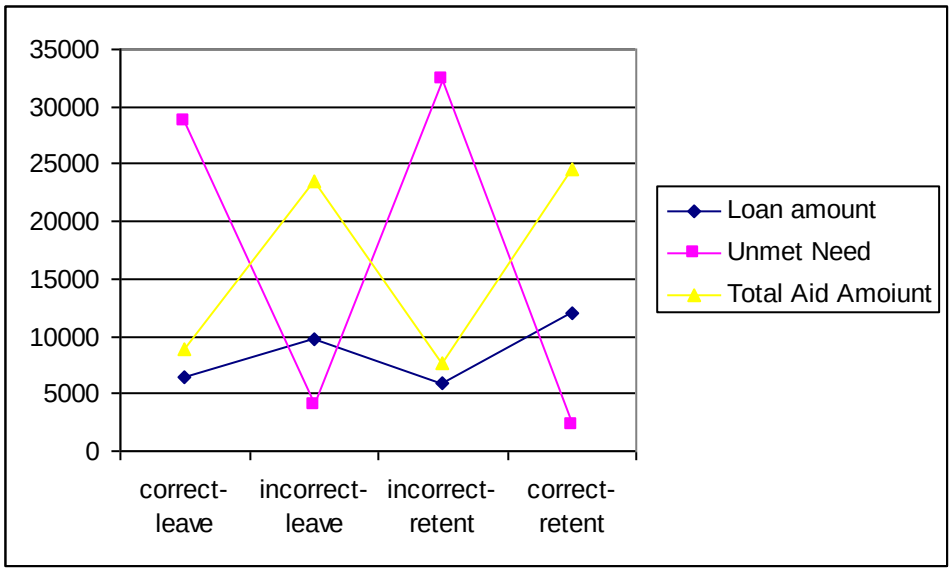


Figure 9
Model 3



Conclusions and Implications for Future Research or Current Practice

This study has made a significant contribution by finding a way to identify students who are at risk of dropping out, so we can provide intervention before they actually drop out. Further exploration is needed to find situations in which the models fail to predict accurately. Especially, I should put my efforts to reduce the group of students who I predicted would retain, but actually left. It is possible not just to look at whether they retain or not, but also look at the reasons for leaving. Students who are academically dismissed, disciplinary dismissed, or transferred to other university might have very different characters. In addition, other factors on top of financial aid and academic quality should also be considered. For example, whether they live on campus or not, whether they participate in campus ministry activities or not, may also contribute to their decision to stay at CUA. Further exploration into these areas might shed light as to how the models fail to predict correctly. It is very likely that I can find ways to improve the models and make better predictions in the years to come.

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