North East Association for Institutional Research
30th Annual Conference Proceedings

Information Leadership
The Challenge & The Responsibility

November 15 - 18, 2003
Newport Marriott, Newport, RI

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Dear NEAIR Friends and Colleagues,

The 30th annual conference of the Northeast Association for Institutional Research was held from November 15th through 18th at the ever-popular Newport Marriott, RI! We had almost 270 attendees, many who attended one of the twelve pre-conference workshops. Peggy Williams, President of Ithaca College, set the tone for the conference with her talk on ***"A World in Need of Leaders"*** in which she challenged us all to think *about what is leadership? What is effective leadership? Who is a leader?*

Highlights of the conference program also included a keynote by André Bell, Vice President for College and University Enrollment Services on ***"What Senior Administrators Need to Know"*** in which he illustrated the needs, decision-making context and style of college officers with the goal of assisting researchers in being more effective.

Martha Gray, Director of Institutional Research at Ithaca College, was instrumental in putting together a winning conference! She was helped greatly by Mary Lou Gerek, Institutional Research Analyst at Nazareth College. I can't thank both of them enough for taking care of all the little details and also undertaking a job that is larger than anyone knows! Martha's tireless efforts and her desire for perfection made the conference a huge success. Thanks again, Martha!

Tom Frank, Director of Institutional Research at Providence College, ably managed local arrangements with the hotel and coordinated dinner groups! Tom's committee tragically lost one of its members, as did NEAIR, and there was a dedication to Charles Haskell in the program. Those of us who knew him missed seeing him at these meetings. Thanks to Andrea Spargo, from Bryant College, and Sarah Parrott, NEAIR Website Editor from Brandeis University, for their hard work on creating web pages for the conference.

Special thanks to Ellen Peters, from Bates College, who managed the pre-conference workshops and to Michelle Appel, from the University of Maryland-College Park, who was in charge of vendor relations and did an admirable job! Thanks to Salve Regina for hosting pre-conference workshops in their computing lab. Thanks to Mindy Wang, from Catholic American University, for her continued work on the pre-conference workshop and conference evaluations. Thanks to Phyllis Fitzpatrick, from Fairfield University, for continuing development of the mentoring program. David Cheng, NEAIR Publications Chair, and his committee worked thoroughly and professionally to pull together this document. We are very pleased with the quality of the papers presented this year. And, thanks to all the NEAIR Steering Committee members, who participated in the conference planning at an unprecedented level.

Finally, I would like to thank Beth Simpson, NEAIR Administrative Coordinator. Beth has brought professionalism to the organization and has been very important to the overall success of NEAIR. I also want to thank Chelsea Simpson, who helped with registration at Newport and whose friendly face and eagerness to help brought a smile to the face of anyone who met her!

Becky Brodigan
2003 NEAIR President

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N.B.: There are no recipients for the Best Paper Award and the Best First Paper Award for the 30th Annual Conference Proceedings.

THE ACADEMIC CONSEQUENCES OF STATE NEED-BASED GRANTS

Philip L. Beardsley
Independent Consultant

The Program To Be Examined

The Tuition Aid Grants (TAG) program is the bedrock need-based state grant program in New Jersey. Students who are or intend to be full-time undergraduates at an approved New Jersey college or university are potentially eligible. Applicants must demonstrate a need for student aid, and must have been legal residents of New Jersey for at least 12 consecutive months before receiving the grant. Students who have received a baccalaureate degree are not eligible. The grants differ in value depending upon the student's need, the cost to attend the college, and the funds available for distribution to students. Grants are renewable annually for up to three additional years, given satisfactory academic progress and continued eligibility. The program assists about a third of (nonfinancially) eligible full-time undergraduates in New Jersey. Currently, approximately $170,000,000 is awarded each year to about 60,000 qualified students. Over 280,000 students apply annually. TAG has provided financial aid to hundreds of thousands of low-income students for a quarter-century; as a result, these students have gained financial access to higher education that would not have been available otherwise.

The Evaluation Study

But how have aid recipients performed academically? Have access and affordability been attained at the expense of academic success? Do the academic results differ by sector (type of institution)? The purpose of this study is to answer these questions by comparing the academic performance of aid recipients with that of other students.

Most research on need-based financial aid has focused on access and affordability, not academics. Also, most studies of need-based grant programs have dealt with Pell and have been carried by NCES/OPE. A list of examples of this previous research is presented at the end of the paper.

Here the focus is academic. The main strategy is to compare aid recipients and nonrecipients on a variety of academic outcome measures. It is essential to understand that when aid recipients on average are roughly equal to nonrecipients on these measures, that is a very positive result; it is not a "neutral" result. The reason is that low incomes tend to be associated with a host of other disadvantages—inferior high school preparation, parents with limited levels of education, etc. The program we are examining does not directly address these other important factors. However, many of the analyses reported herein statistically control for—that is, adjust for the role of—at least some of these additional obstacles to academic success, thereby helping to isolate the impact of the aid itself. In various instances the following variables (or a subset) are controlled for:

sex, race/ethnicity-Black, race/ethnicity-Hispanic, race/ethnicity-Asian, SAT-math, SAT-verbal, high school rank percentile, father's education, and mother's education. (The impact of race/ethnicity-white may be inferred from the coefficients of the other race/ethnicity categories, which are relative to the white category.)

This study examines three "snapshot" indicators, i.e., outcomes measured at one point in time (fall 2000), and two longitudinal indicators, i.e. outcomes measured over a period of one or more years. The snapshot indicators are credits enrolled during a particular semester, cumulative grade point average (GPA), and credits accumulated since initial enrollment. The longitudinal indicators are third-semester retention rates (fall 1998 to fall 1999). and six-year graduation rates (fall 1995 through spring 2001). Credits enrolled in part reflect aid recipients' not having to work so many hours to earn money (and therefore having more time to study), GPA is a standard measure of overall academic performance, and credits accumulated indicate progress toward an eventual degree. Retention rates—percentages of freshmen returning for a third semester—are considered an appropriate indicator of continuity of enrollment for community colleges, given their complex missions, which include much more than graduation (and/or transfer). Graduation rates are clearly important for all four-year institutions, but only the public institutions have accumulated enough years of data in the central tracking system to permit the calculation of six-year rates, the standard time frame.

Analyses of the first three indicators have been carried out separately for each of 14 *nonfreshman* groups of students who represent combinations of *three* sectors (four-year public vs. four-year independent [private nonprofit nontheological] vs. two-year public), *three* class levels (sophomore vs. junior vs. senior), and *two* categories defined by whether a student is financially dependent on—or independent of—his/her parents. Since community colleges have only one nonfreshman class level, the number of combinations is 3 X 3 X 2 = 18 minus 2 X 2 = 4, or 14.

Analyses of the two longitudinal indicators—retention and graduation—used the standard cohort outcomes methodology in which cohorts are defined at the time of initial enrollment, and in terms of the characteristics that their members have at that point. The possibility that some of these characteristics change later is not examined, much less statistically taken into account. For example, it is possible that a relatively small number of aid recipients lost their eligibility after, say, the first year, as a result of an increase in family income. It is also possible that a relatively small number of nonrecipients became eligible for aid at a later point because of a decline in family income. To attempt to incorporate these possibilities into the analyses would have been prohibitively complex, which is why cohort analyses in general almost invariably ignore changes in status (e.g., full-time to part-time) that occur after initial enrollment.

All comparisons between aid recipients and nonrecipients are performed in two ways. First there is a simple comparison between the two categories on the academic indicator in question, without taking any other variables into account ("bivariate" analysis). This comparison is immediately followed by a more complex—and ultimately

more meaningful, though also more technical—comparison in which six to nine other variables are controlled ("multivariate" analysis).

All of the students included in this study are in both the state's centralized grants/scholarships data system (dealing only with state programs) and the state's centralized enrollment/degree/student tracking data system. The former system identifies aid recipients, dependency status, and parents' education, while the latter contains—or permits the calculation of—academic outcomes. The merged files used to produce the results exclude students who did not file a Free Application for Federal Student Aid (FAFSA), as well as students who are enrolled at any of the nine independent institutions that are not members of the student tracking system. While all public institutions belong to the tracking system, only five of the 14 independent institutions do so.

The five independent institutions in the student tracking system are reasonably representative of the sector as a whole. For example, in fall 2000 the mean verbal SAT score for the included institutions (where the latter were weighted equally) was 528; for the other nine it was 521. The mean math SAT score for the five was 541; for the nine it was 521. The six-year (1994-2000) graduation rates for the two sets of independent institutions are even closer: 53 percent for the five data system members, and 54 percent for the others. (These graduation-rate data are from the Graduation Rate Survey [GRS], which cannot be broken down by financial aid status.)

The next section describes in somewhat more technical terms the statistical techniques, including the additional variables employed, that produced the results.

Statistical Techniques and Models

The bivariate analyses of the three snapshot indicators—credits enrolled, GPA, and credits accumulated—took the form of a difference of means. A *t* test (pooled) was used throughout this portion of the study. What made this approach possible was the fact that all of these indicators are continuous variables (i.e., variables measured on a quantitative scale).

The multivariate analyses of these indicators took the form of multiple regression (ordinary least squares, or OLS), again made possible by the continuous dependent variables. For all sectors the key independent variable, receipt/nonreceipt of need-based grant aid, is a dichotomous or "dummy" variable, scored zero and one. For all sectors, several of the other independent variables (serving as control variables) are also dummies—sex, race/ethnicity-Black or not, race/ethnicity-Hispanic or not, race/ethnicity-Asian or not, father's education (college graduate or not), and mother's education (same format). For the senior public institutions and the independent institutions, there are three additional independent/control variables, all continuous—SAT-math, SAT-verbal, and high school rank percentile. These additional variables were not available in the case of the community colleges. Test of significance were used in all the regressions—*t*-tests for individual predictors, *F* tests for entire models.

The bivariate analyses of the two longitudinal indicators—retention rates and graduation rates—took the form of 2 X 2 cross-tabs, since both the aid variable and the indicators are dichotomous. Fisher's Exact Test was used in this aspect of the study.

The multivariate analyses of graduation and retention could not use multiple regression, because of the fact that the dependent variables are dichotomous, which causes violations of some of the mathematical assumptions of regression. Therefore logistic regression was used—a technique developed specifically for situations of this sort. For the 1998 community college cohort it was not possible to use SAT or high school rank, because these variables are not collected by the institutions in question. However, the other control variables were available—sex, the three race/ethnicity dummies, and the two parents'-education dummies. For the 1995 senior public cohort SAT and high school rank were available, along with sex and race/ethnicity, but not parents' education, which at that time had not yet been added to the FAFSA. Logistic regression features maximum-likelihood estimation and a chi-square approach to testing.

Snapshot Indicators: Credits Enrolled

As explained above, analyses of all snapshot indicators have been carried out separately for each of 14 groups of students as defined simultaneously by sector, class level, and dependency status.

While one would generally expect the multivariate analyses to be more positive—and more valid (for reasons explained above)—than the bivariate analyses, with regard to credits enrolled, even the *bivariate* analyses are predominantly positive. Aid recipients are higher than nonrecipients in two instances, lower in two, and equal in 10. The results for the independent institutions are the most positive, followed by the senior public institutions.

The *multivariate* results for credits enrolled and aid are even more positive. In only one of the 14 groups are aid recipients lower; there are three in which they are higher, and eight in which they are equal. (Two results are inconclusive.) The results for the independent institutions are the most positive, followed by the senior public institutions.

The multivariate results are slightly more positive for dependent students than for independent students.

Snapshot Indicators: GPA

With regard to the *bivariate* analyses, in nine of the 14 cases aid recipients have lower GPAs than nonrecipients. In the remaining five instances the aid recipients have the same or possibly slightly higher GPAs. The results for the community colleges are the most positive from the standpoint of the aid program under review, and those for the senior public institutions least so.

The *multivariate* results for GPA and aid are dramatically different. In seven cases there is no difference between recipients and nonrecipients. In four instances the aid recipients are clearly higher, while in two they are possibly higher. (One result is inconclusive.) The community college results are the most positive; the two senior sectors are about equally so.

The multivariate results are slightly more positive for dependent students than for independent students.

Snapshot Indicators: Credits Accumulated

Here the *bivariate* analyses are very mixed. Aid recipients are lower in five or six instances, equal in eight, and higher in none. The results for the senior public institutions are the most positive, followed by the independent institutions.

The *multivariate* results for credits accumulated and aid are more positive, though five groups are inconclusive. In only one or two of the groups are aid recipients lower; there may be one in which they are higher, and there are six in which they are equal. The results for the independent institutions are the most positive.

The multivariate results are slightly more positive for dependent students than for independent students.

Longitudinal Indicators: Third-Semester Retention Rates

These rates have been calculated only for the community colleges, for which they are a more appropriate indicator than graduation rates. In *both* the bivariate *and* the multivariate analyses the aid recipients are equal to the nonrecipients. This conclusion applies to both dependent and independent students.

Longitudinal Indicators: Six-Year Graduation Rates

These rates can be calculated only for the senior public sector, because even the independent institutions that belong to the student tracking system have not been members for six years. The *bivariate* results show a lower rate for dependent aid recipients (as compared with nonrecipients), and an equal rate for independent aid recipients. By contrast the *multivariate* results show equal rates for both dependent and independent recipients.

Summary and Conclusions

Among a total of 38 conclusive multivariate analyses performed on different outcome indicators and different groups, in 26 percent of the analyses aid recipients performed better than their counterparts, in 66 percent the two were equal, and in eight percent aid recipients' performance was lower than others'.

These results were consistent across different types of institutions. For the senior public institutions, 15 percent of the analyses saw aid recipients perform better than their peers, 70 percent saw the two groups perform equally, and 15 percent saw aid recipients perform less well than other students. For the independent institutions, 38 percent of the analyses saw aid recipients perform better than others, 62 percent saw them perform equally well, and none saw them perform less well. Finally, for the community colleges, 40 percent of the analyses saw aid recipients perform better than others, 60 percent saw them perform equally well, and none saw them perform less well.

The results were also similar for financially dependent and financially independent students. For dependent students, 27 percent of the analyses saw aid recipients perform better than their peers, 68 percent saw the two categories perform equally, and five percent saw aid recipients perform less well than other students. For independent students, 25 percent of the analyses saw aid recipients perform better than their counterparts, 62 percent saw the two categories perform equally, and 13 percent saw aid recipients perform less well.

Clearly, aid recipients have performed relatively well academically, and supporting their access to higher education has been thoroughly consistent with institutional aspirations toward quality. While outcomes need to be improved for college students in general, including financially needy students, the mere fact of being financially needy does not disproportionately cause a student to experience academic difficulties—quite the contrary. Much of the reason for this fact lies in the ability of need-based grant aid to level the playing field.

Implications for Future Action and Research

Four implications for action and research should be highlighted. First, there is a strong possibility that advocacy efforts can expand the rationale for need-based grant aid to include the academic sphere, and that this expanded effort can rely on rigorous statistical evidence. Second, future research should look at additional academic consequences (e.g., learning outcomes). Three, it should also carry out replications of this study in other states with major need-based grant programs to see whether the results presented here are part of a national phenomenon. Finally, institutions that have their own need-based aid can assess the consequences of this aid, or, failing that, they can assess the consequences of Pell on their campus.

Selected Previous Works Dealing with Need-Based Aid

Advisory Committee on Student Financial Assistance (2001). *Access denied*. Washington, DC: Author.

Advisory Committee on Student Financial Assistance (2002). *Empty promises*. Washington, DC: Author.

Davis, J. S. (2000). *College affordability*. Indianapolis: USA Group Foundation.

Heller, D. E. (2001). *The Effects of Tuition Prices and Financial Aid on Enrollment in*

Higher Education. Rancho Cordova, CA: EDFUND.

Kipp, S. M. III, Price, D. V., & Wohlford, J. K. (2002). *Unequal opportunity*. Indianapolis, IN: Lumina Foundation for Education.

The National Center for Public Policy and Higher Education (2002). *Losing ground*. San Jose, CA: Author.

Public Agenda (2002). *The affordability of higher education*. New York: Author.

St. John, E. P. (2002). *The access challenge*. Bloomington, IN: Indiana University, Indiana Education Policy Center.

U. S. Department of Education, National Center for Education Statistics (2002a). *Descriptive summary of 1995-96 beginning postsecondary students: six years later*. Washington, DC: Author.

U. S. Department of Education, National Center for Education Statistics (2002b). *Persistence and attainment of beginning students with Pell grants*. Washington, DC: Author.

U. S. Department of Education, National Center for Education Statistics (2002c). *Profile of undergraduates in U. S. postsecondary institutions: 1999-2000*. Washington, DC: Author.

U. S. Department of Education, National Center for Education Statistics (2002d). *Student financing of undergraduate education: 1999-2000*. Washington, DC: Author.

U. S. Department of Education, National Center for Education Statistics (2002e). *What students pay for college*. Washington, DC: Author.

USING THE WEB TO BOOST INSTITUTIONAL RESEARCH EFFICIENCY AND REACH

Ellen Boylan-Fick, M.P.S.
Assistant Director of Institutional Research
Charlotte Woodward, M.S.
Data Analyst/Coordinator

Office of Planning and Institutional Research
Marywood University

Introduction

Simply answering the sheer volume of requests for information received by an institutional research office in any given year can be daunting. Add to that job the need to complete critical assessment and accreditation tasks, and no wonder institutional researchers feel taxed. One approach to help lighten the load is to build a data system for storing and sharing documents on the web, a system accessible on or off campus and secured by password protection. A central site like this can ease the transfer and control of a bounty of institutional research and, with hope, eliminate at least a few chronic headaches for IR offices.

There are several easy and practical innovations that can be made to enhance and improve IR operations inside and out. Included here are a number of tips and tactics used for data storage and exchange. Methods for making data available openly or by password are explained, and a rationale for organizing web pages by function (e.g., assessment or accreditation) or user group (e.g., Deans or Cabinet) is given. Some handy tools for managing data are suggested, and ways to use commonly available programs to link one site to another automatically are described. A list of benefits to an IR office of building web accessibility are given, as well, particularly the ways ready access provides a boost in recognition and appreciation for the products of institutional research, overall.

Objective

The objective of this paper is to describe the leadership of one institutional research office in establishing a comprehensive data warehouse on the web that has easy access for users both on and off campus. This initiative holds particular promise for institutional researchers trying to navigate the heavy surf of data collection, management, and distribution, while simultaneously supporting decision-makers at the executive level with reports and analyses. Undoubtedly, the gain in building this bigger presence on the web is an acceleration in traffic on the IR site by an even broader profile of users and, in turn, greater and more diverse use of data for a wider array of reasons. This helps satisfy the desire of institutional researchers to work smarter, not harder, and share more data with more people. What could be better?

Why A Web Warehouse?

Six combined factors, some arising internally, some externally, provided the impetus for expanding IR web warehousing at the university. The first is an upcoming self-study and accreditation visit in approximately two years. As that date approaches, so has the fierce drive begun to gather, inventory, and make available the countless reports and program summaries required by both the accreditation visiting team and the internal self-study groups. The critical objective here is to provide easy access to evidence, and integrated web sites can facilitate that process.

A second factor is our need to respond to internal requests for information by others involved in accreditation or in continuing assessment projects, like faculty members, campus administrators, or department heads. As Wierschem, McMillen, and McBroom (2003) point out, "IR personnel want to 'work smarter' in their efforts to provide information to campus decision-makers, as well as provide more stable and reliable data."

A third factor prompting action to boost IR reach via the web relates to accreditation review, as well. There is a need to present data in a form compatible with outcomes assessment plans of the institution, which must satisfy certain requirements set by the accrediting body. Outcomes assessment plans can be assembled using a process of electronic file sharing from university web pages, and later integrated into an accreditation report, and this initiative supports that process.

Another internal factor prompting the creation of an IR web warehouse is the need to provide secure locations that can be accessed by temporary office help working in the IR office during the academic year, whether work-study students, graduate assistants, or IR consultants. Having a system of central web sites allows them to bypass the complex and sometimes confidential computer network dedicated to executive level planning and research, and get to the tables or formats they need to complete projects.

Two external factors are important to this web endeavor, as well. First, mushrooming demands for data by external sources, whether government agencies or publishing houses, looms large every year. The repetitive and cyclical nature of answering these requests is a big burden on any IR office, so the objective was to devise some simple solutions for satisfying their needs externally without sacrificing ours, internally. Another external factor is the need to assist lobbying efforts on behalf of key associations of colleges and universities. State level associations continue the quest to strengthen higher education, and university IR offices can support that by having accurate historical data available quickly in pre-packaged form on the web, like a Fact Book.

Easy Access Expands Use of Data

Institutional research offices at many colleges and universities are working to increase recognition of the scope and impact of their contributions. They do this by making professional presentations off-site, or giving workshops on campus that demonstrate data availability and analysis. Also, reports important to executive committees are distributed, or hands-on instruction is given to internal users, which

shows how to access and use the rich stores of data at hand. According to Hall, Goodwin, and Stewart (2003), "As higher education institutions increasingly focus on strategic planning and assessment and broader participation in these processes, data integrity, accessibility, and interpretation are becoming even more critical than in the past."

Among the benefits of building an IR web reserve is freeing staff time previously spent on data searches, and saving money on printing cost for reports that literally hundreds of people might need to see. It's a useful archive for university history, and a terrific tool for service to a wide variety of constituents.

An IR web reserve offers wider distribution of actual analysis of research, not just a jumbled mass of raw data. This provides relief to consumers who might be uncomfortable touring around statistics. Too, when a wider community gets a chance to see comprehensive reports on the results of a survey, or the evolving process of linking planning and mission review to accreditation requirements (Boylan-Fick & Sadowski, 2002), for example, the result is a broad elevation of knowledge about your university's role and a keen understanding of your position on the regional or national higher education stage. Fostering that awareness fulfills a vital teaching function for IR, as well, and can engage the entire academic community in achieving progress on university goals.

The way information is presented can also be instructive to the external academic community. Skillfully designed templates for analyzing data and attention-getting graphic formats can be duplicated by other campus units for their own use and benefit. This is an effective way to promote recognition of the critical IR function in the university, and enhance networking and professional development.

A Continuum of University Web Data

There are five web pages maintained by the Institutional Research office at Marywood: one public Planning and Institutional Research page (Figure 1), and four password secure pages: a Marywood Net for staff and faculty, a page only for Deans, a Cabinet area for executives, and a Middle States self-study page, all frequently refreshed.

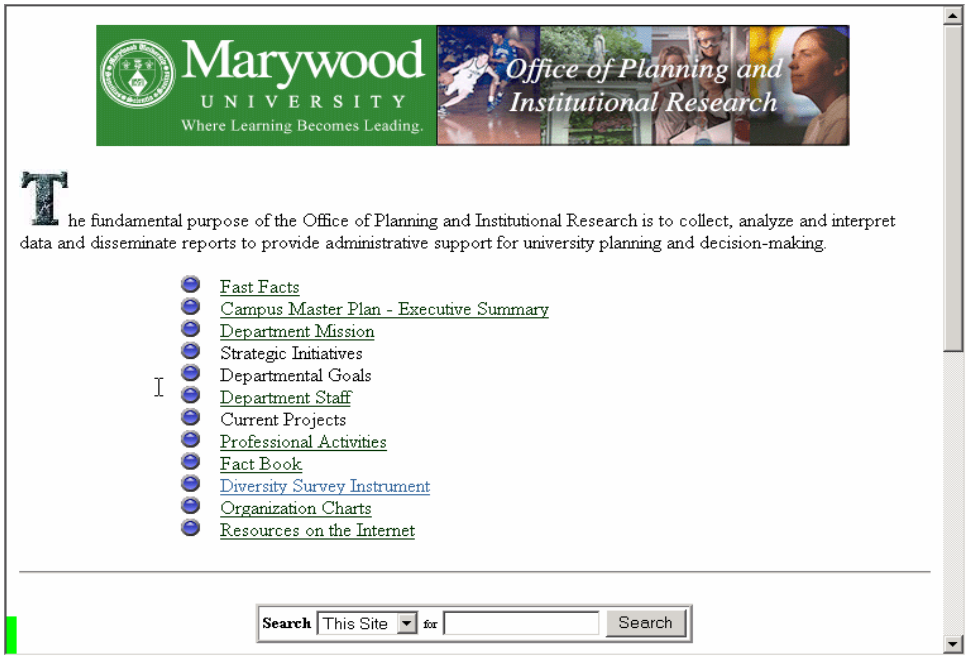


Figure 1. Marywood web site's Planning and IR page, open to the public.

The Planning and Institutional Research page

The publicly available Planning and Institutional Research page has reports and tables of university information like the Marywood University "Fact Book," a Diversity Survey instrument, and the campus Strategic Initiatives, all of which can be shared publicly with other universities, publishers, government entities, and on-campus constituents. Repeat inquiries about items found in the Fact Book, like student enrollment, tuition, number of majors available, and the number of computers and library holdings available, for examples, can all be directed to one web location. Too, key information about recent trends in the data in many subject areas is open to any visitor, a very important feature in this time of increasing emphasis on accountability.

The campus intranet

The campus intranet is another web source for outreach and distribution of data from the Institutional Research Office, albeit a more secure one. Only campus staff and faculty have access, via their individual password. Some listings are shown in Figure 2.

Figure 2. Password protected Marywood Net page

A web page for Deans

Another more secure area of the Marywood Net is for our deans only (Figure 3). There, they can access sensitive information for their individual colleges, including retention reports, information about enrollment in majors and, very important, the archive of Student Evaluations of Instruction. Having this page designated for Deans mandates that they become the primary source for faculty access to evaluation results in their area. This ensures not only that the integrity of the data is maintained, but also allows for better communication and feedback between the parties charged with preserving academic excellence. Too, it frees the Institutional Research office from replying to individual faculty inquiries about their course evaluations, especially when faculty are gathering materials in support of tenure applications.

Figure 3. Dean's page within the campus intranet.

Also on the Dean's page is data grouped by department (Figure 4). Here a Dean can access recent accreditation reports by department, and share important data with chairs.

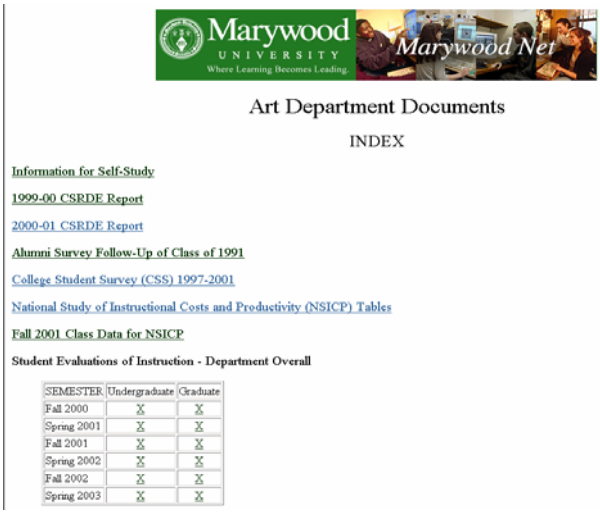


Figure 4 Documents within the Dean's page.

The Cabinet page

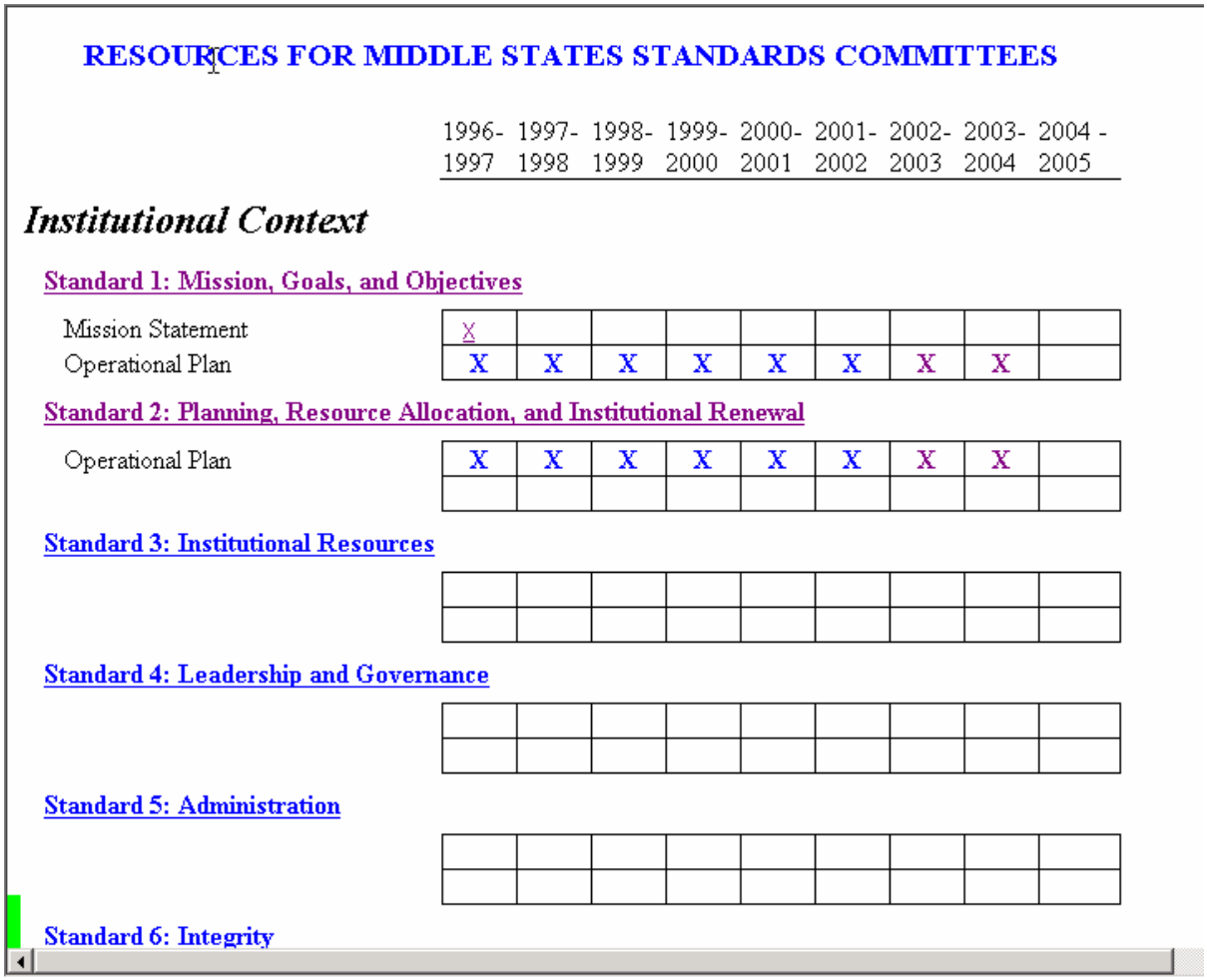
Another important web source for executive administrators is the Cabinet page, available to the university president and officers such as vice-presidents and assistant vice-presidents. A unique feature of this resource is how easy it is for executive administrators to access it. With no more than a click of their mouse to a icon housed in their Microsoft Outlook suite, Cabinet members can obtain full detail on fiscal activity, included advancement and business affairs proceedings, reports from state and national consortia to which the university belongs, weekly updates on admissions activity, and reports in the university's comprehensive annual Data Book, including activity within departments and programs, revenues and expenses, and enrollment trends. Some of the reports found on the Cabinet page follow.

- The Annual Fund – Private Sources.xls
- 2003-04 Credits and Tuition.xls
- 2002-03 Credits and Tuition.xls
- 2002-03 Data Book
- Impact 2000 Fiscal Cash Report.xls
- MarywoodPresentation-6.ppt
- Faculty Survey 2001-02.xls
- AICUP Tuition and Fees Survey 2002-2003.pdf
- CONFIRMS.XLS
- Fall 2003 Factbook.doc
- Fall 2002 Factbook.doc

The Marywood Middle States Accreditation page

In preparation for a Middle States Association accreditation visit in Spring 2006, outcomes assessment plans, survey results, program accreditation reports, and a host of other reports completed within the 10-year accreditation window are being posted to a dedicated Marywood University Middle States Accreditation page. The intent is to facilitate full access to a storehouse of accreditation evidence by the Middle States team from locations on and off campus. This process of creating electronic access for accreditation visitors off campus and self-study participants on campus is a relatively new activity at universities nationally, but accrediting bodies are starting to request this system of access be created prior to a visit, to whatever degree possible given a university's abilities and available technology. Although instantaneous exchange might seem to be the ideal circumstance, Banta (2003) cautions not to set expectations too high. Despite pioneering efforts to build a complete electronic portfolio for accreditation at Indiana University – Purdue University Indianapolis, a post-visit request from the visitors was that the university, "provide a narrative self-study on paper in addition to the one on the Web," Banta reported. Even on campus, the Indiana University review team admitted in the end that, "respondents relied primarily on the printed copy of the self-study!" (p.5).

Figure 5. Electronic roadmap for an evaluation team, where cells link to appropriate documents.



RESOURCES FOR MIDDLE STATES STANDARDS COMMITTEES

	1996-1997	1997-1998	1998-1999	1999-2000	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005
Institutional Context									
Standard 1: Mission, Goals, and Objectives									
Mission Statement	X								
Operational Plan	X	X	X	X	X	X	X	X	
Standard 2: Planning, Resource Allocation, and Institutional Renewal									
Operational Plan	X	X	X	X	X	X	X	X	
Standard 3: Institutional Resources									
Standard 4: Leadership and Governance									
Standard 5: Administration									
Standard 6: Integrity									

A nifty feature of the Marywood University Middle States site under construction will be the opportunity for rapid exchange of documents by self-study review teams, such as minutes of steering committee meetings or the complete text of Middle States standards and guidelines. With this object in mind, three password-protected areas within the site have been created. One area is for the Steering Committee members, only, where they can track documents that have been distributed, such as the accreditation timeline, suggested models for the self-study, contact information, and so on. Another area is for members of the various Task Forces that are organized to study one or more of the fourteen standards. This section will link the standards to the existing documents (both online and hard copy) that provide evidence for meeting the fundamental elements. A third area is an electronic roadmap (Figure 5) for the site evaluation team members, where a simple click will take them to a named document, such as one of the fourteen programs at Marywood with professional accreditation.

All existing accreditation reports are being converted to PDF format and stored using a flatbed scanner. Once a document has been scanned, a system user can easily read it later. Also, the complementary software allows for searching of the entire warehouse of Middle States evidence for individual words, phrases, or names, if desired. Over time, survey reports from dining services, residence halls, the counseling center (drug and alcohol survey), and career services, among others, will be added to the site. Eventually, an immense digital archive of evidence for accreditation will be created, with all entries available at the mere click of a mouse. Even after the accreditation visit, there will be many possible uses of this scanning tool for other purposes. For example, at our university library, digital archiving of university documents and even rare holdings can continue well into the future.

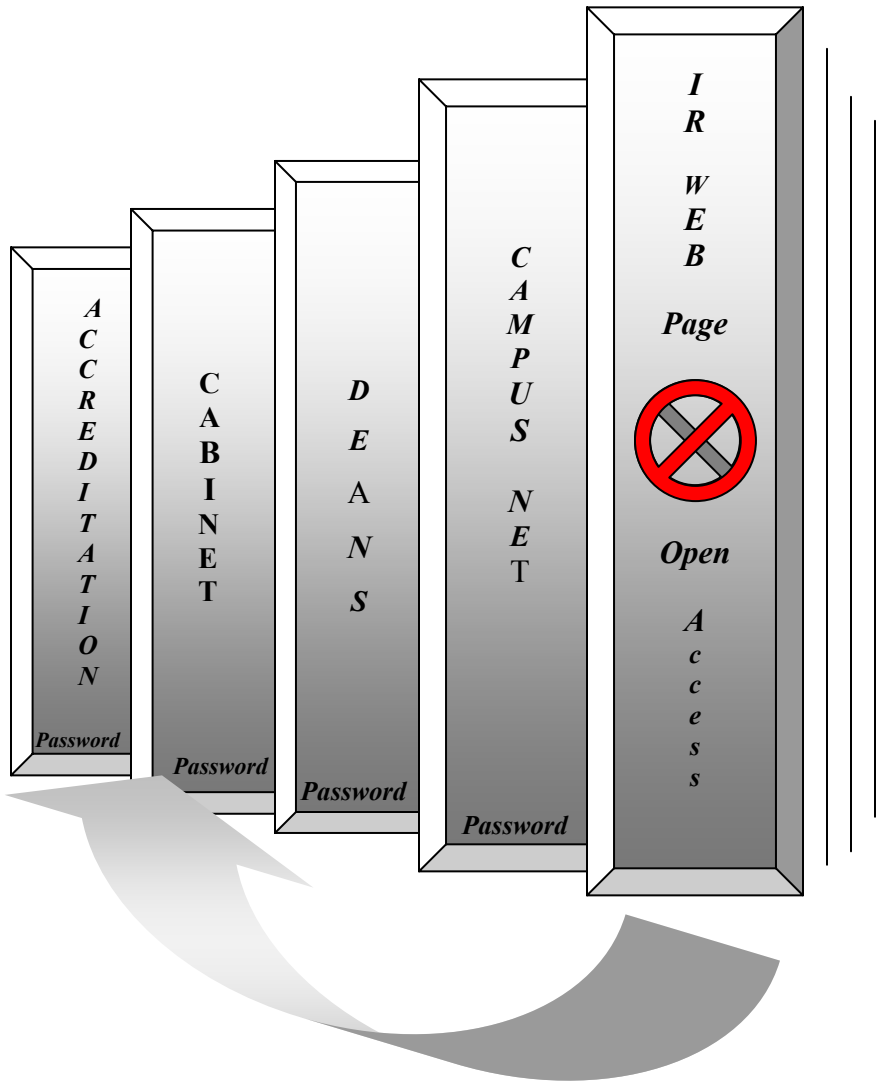


Figure 6. Overall configuration of a web data warehouse site

Handy tools for IR web work

An added feature of using the flatbed scanner with a sheet feeder (in our case, the HP Scanjet 8250) to prepare documents for web posting is that software included with the unit allows direct conversion of the scanned image to a PDF file. This can save the expense of purchasing *Adobe Acrobat* software for conversion purposes. However, the limits of your computer system might present an obstacle if the processing capability is too small to assemble large documents. In that case, it might be necessary to purchase *Adobe Acrobat*.

Another useful item in the IR electronic toolkit is the Microsoft Office suite, particularly when the entire campus is networked, standardized to the Microsoft Office suite, and shares the same version of it. This comparability ensures that any other user on the campus network can read any document the IR office generates.

Packages for statistical analysis (SPSS or SAS) make it possible to capture snapshots of student data at a given point in time, as often as needed. The data is extracted from the mainstream, can remain static or may be altered, but is always based on the same population of students.

The Optical Mark Reader (OMR) is for scanning student evaluations of instruction. Results are stored and made available to Deans via the web, and then used for evaluating courses or programs, or faculty rank and tenure applications. Other bubble sheet surveys administered by the IR office can be scanned by the OMR and the data analyzed, as well.

Our *Adobe Acrobat* to Microsoft Word conversion software is useful because external sources sometimes submit PDF files, particularly tabular data, which might need change. Previously, it was necessary to scan the page and attempt to use OCR software to recognize it, which often resulted in scrambled tables. PDF to word conversion software allows direct transfer of tables to files, so a lot of retyping is saved. For direct conversion of an image, screen capture software like SnagIt, for example, works particularly well for workshops or instruction about using the web site.

For creating hyperlinks like those shown in Figure 5, the dependable workhorse Excel program is used. First, a spreadsheet is created in Excel. Then, making links is a simple matter of right-clicking an individual cell and following the steps for making a hyperlink to the desired file link location.

Data shared are data used

Establishing a coordinated, multi-level information system on the web has a clearly positive impact on IR functions and creates opportunities for some great new innovations in data sharing operations. An electronic portfolio can enable faculty and administrators, “to see more connections between their own work and that in other units,” says Banta (2003, p.3), and expands “the pool of faculty and administrators who have a broad vision of the campus and its potential.”

Data sharing has an organizational function, too, one that can encourage overall institutional improvement. As more and more individuals on campus use the institutional research available to them, a collection of like-minded people knowledgeable about higher education research and practice develops. Bolman and Deal (1991) point out that assembling a pool of like-minded people for new initiatives creates a body of leaders, "who have a common vision and common language," and that in turn fosters an "organizational synergy" (p. 233) for change. This synergy creates a greater likelihood that institutional policy and decisions will be influenced wisely by savvy use of institutional research reports.

Facilitating web access to research has an important institutional assessment function, as well. Accreditation standards dictate that institutional assessment has a dichotomy of purpose, accountability *and* improvement (Ewell, 2002). So, sharing outcomes measures via the web not only helps accountability, but also enables easier access by key decision makers to information critical to guiding change and improvement.

A happy consequence of creating a truly comprehensive IR website is how readily it sharpens the look and accessibility of IR to constituents. Easy access and a clear invitation to others to explore the bounty of research that is available acts to build the consensus that institutional research is an extremely valuable campus resource for all.

References

Banta, T. (2003, July-August). Electronic portfolios for accreditation? *Assessment Updat,. 15*(4), 3-6.

Bolman, L.G., and Deal, T.E. (1997). *Reframing organizations: Artistry, choice, and leadership* (2nd ed.). San Francisco: Jossey-Bass.

Boylan-Fick, E., and Sadowski, B.R. (2002, November). *Linking assessment planning and mission review: One university's experience.* Paper presented at the annual conference of North East Association of Institutional Research (NEAIR), Annapolis, MD.

Ciolino, S. (2003). Suggested matrix for a Middle States electronic portfolio. Email communication, November 2003, between Dr. Barbara R. Sadowski, Marywood University and Salvatore Ciolino, Gettysburg College, Gettysburg, Pennsylvania.

Ewell, P.T. (2002). An emerging scholarship: A brief history of assessment. In T. Banta (Ed.), *Building a scholarship of assessment.* New York: John Wiley & Sons.

Hall, C.W., Goodwin, C.M., and Stewart, S. L. (2003, May). *Providing quality institutional data for planning and decision-making: The fact book and beyond.* Paper presented at the annual conference of the Association of

Institutional Research (AIR), Tampa, FL.

Wierschem, D., McMillen, J., and McBroom, R. (2003, Summer). *Methodology for developing an institutional data warehouse.* Association for Institutional Research Professional File. 88, 1-9.

DESIGNING ALUMNI RESEARCH TO MEET THE CHALLENGES AND RESPONSIBILITIES OF ASSESSMENT AND ACCREDITATION

Anne Marie Delaney
Director of Institutional Research
Babson College

Introduction

Based on a recently completed study of 522 graduates at a private college in the northeast, this paper presents a model for transforming alumni research studies into critical resources of information for assessment and accreditation. The major objectives of this study were to assess the College's effectiveness in preparing graduates for rewarding careers and enriching lives after graduation and to evaluate how well the curriculum contributed to this goal. Graduates were asked to evaluate their education regarding how it enhanced their abilities and knowledge related to the core competencies of the curriculum; the degree to which their education promoted their intellectual and personal growth; their level of satisfaction with various college experiences; and how participation in college activities contributed to their development.

Review of the Literature

The literature offers both a rationale and empirical evidence regarding the value of alumni research and its use in the assessment of higher education's effectiveness. Reasons include the belief that alumni offer a unique perspective regarding the preparation of students for life after graduation; their contribution is considered essential for a comprehensive evaluation; and their satisfaction is deemed necessary to the strength and vitality of the institution.

As Hartman and Schmidt (l995) observe, understanding and promoting alumni satisfaction is important given that satisfied alumni are likely to help colleges financially, offer positive word-of-mouth communication, and provide jobs to subsequent graduates. Pearson (l999) determined that alumni who were very satisfied perceived the value of their college education to be greater, took pride in their degree, had a stronger personal commitment to the institution, and were more likely to be donors. Martin, et al. (2000) discovered that graduates' satisfaction with academic resources, support services and competency development significantly predicted their perceived employment preparation. Alumni who were more satisfied thought they were better prepared for employment.

The significance of alumni research to outcomes assessment has been recognized for some time (Pike, l990). Alumni can evaluate how well the knowledge and skills developed through the educational program relate to the knowledge and skills required in the workplace (Jennings, l989). Graduates have the capability of assessing the quality of their educational experience tempered by their experiences since graduation (Williford & Moden, l989). They potentially offer an objective perspective given their distance from

involvement with the program (Khalil, l990), and as practicing professionals, alumni may share the benefits of insights not yet developed by current students (Park, l994). More recently, Pettit and Litten (l999) claim that a new era of alumni research has emerged with higher education institutions moving beyond the traditional focus on fundraising and increasingly inviting alumni to provide critical assessments of college and university effectiveness in preparing students to lead productive and rewarding lives. McGuire and Casey (l999) propose that since a college education is an investment whose dividends accrue for many years after graduation, it is appropriate to use alumni research as a way of evaluating the investment.

Volkwein and Bian (l999) present alumni research as part of a comprehensive outcomes assessment model in which alumni surveys serve as vehicles for graduates to evaluate the institution and as catalysts for creating constructive conversations with different campus constituencies who want to know what impact the institution has on its alumni. In designing alumni studies for assessment, one needs to keep in mind a critical principle of good practice in assessment, i.e., that programs have clear, explicitly stated purposes (AAHE, l992). As Banta, et al. (l996) observe, an institutional mission statement is not sufficient as a basis for a comprehensive assessment program. The mission and values must be translated into specific and realistic goals for each academic program and student service to represent the direction in which faculty and administrators wish to see students grow and develop. In accord with this recommendation, the survey for the present study was designed to reflect the goals of the undergraduate curriculum.

Data Source

The population included 375 Class of l999 and 420 Class of 2001 graduates. The survey was administered on the internet and by mail during the summer of 2002. The overall response rate was 66 percent, with 69 percent for the Class of l999 and 63 percent for the Class of 2001. With regard to respondent characteristics, 59 percent are male and 41 percent are female. Ninety-one percent of the alumni are single and 81 percent are U.S. citizens. In terms of racial/ethnic background, 78 percent are White followed by 10 percent Asian, 5 percent Hispanic, 2 percent multi-ethnic, 2 percent Black and 3 percent classify themselves as other.

Results

Alumni Evaluation of their Education. Results revealed substantial variation in alumni assessment of the impact of their undergraduate education on their abilities and knowledge. Table 1 displays the percent of alumni who reported their abilities were ‘greatly’ enhanced by their education. Based on these ratings, abilities and aspects of growth are classified in four categories to reflect very strong, strong, moderate or weak perceived impact. As shown, alumni rated their education very positively for enhancing their ability to work effectively as team members and use technology; 73 and 52 percent respectively reported that their education ‘greatly’ enhanced these abilities. In contrast, only 36 and 22 percent respectively judged that their undergraduate education ‘greatly’ enhanced their ability to relate well to people of different cultures and understand

moral/ethical issues. Even fewer, less than 10 percent, claimed that their education 'greatly' enhanced their ability to develop awareness of social problems, understand the process of science, read or speak a foreign language, and appreciate the arts.

Table 1.
Percent Reporting Abilities 'Greatly Enhanced' by Undergraduate Expereiences

Very Strong		**Strong**	
Function Effectively as Team Member	73%	Communicate Well Orally	49%
Acquire New Skills and Knowledge	70	Leadership Ability	48
Drive to Achieve	60	Intellectual Self-Confidence	42
Use Technology	52		
Think Analytically and Logically	51		
Moderate		**Weak**	
Gain In-Depth Knowledge of a Field	39	Self-Understanding	28
Formulate Creative/Original Ideas	38	Understand Others	25
Relate Well to Different Cultures/Races	36	Understand Ethical Issues	22
Use Quantitative Tools	33	Awareness of Social Problems	8
Social Self-Confidence	31	Understand Science	7
Write Effectively	31	Learn a Foreign Language	7
		Appreciate the Arts	6

Satisfaction with College Experiences. To obtain crucial feedback for program evaluation, alumni were asked to report their level of satisfaction with various college experiences related to the educational program and student life. With regard to academic experiences, alumni reported very high levels of satisfaction with the quality of instruction in business courses and contact with faculty; 72 and 63 percent reported they were 'very satisfied'. In comparison, they reported lower levels of satisfaction with instruction in non-business courses and academic advising; only 32 and 28 percent respectively reported they were very satisfied with these aspects of their education.

Alumni reported notably different levels of satisfaction with various student services and aspects of campus climate. For example, while over 90 percent reported they were satisfied with library resources, computer services, health and registrar office services, only 68 percent reported they were satisfied with campus life and financial aid services. Regarding campus climate, over 80 percent were satisfied with campus safety, campus ethnic/racial diversity and co-curricular programs, while fewer than 50 percent were satisfied with the campus social life.

Impact of College Activities. Analyses of variance were conducted to determine if there were significant relationships between participation in college activities and perceived contribution to one's personal or professional life after graduation. As shown

in Table 2, all of the F ratios are significant, indicating that the perceived contribution differs significantly by level of participation. Those who participated more fully judged that their involvement had a significantly greater effect on their lives. The column labeled 'Extensive' documents the perceived contribution for those who were extensively involved in these activities during college. Most of the mean ratings for this group are close to or higher than 3.50, indicating that alumni who were extensively involved in college activities considered that their experience had a significant effect on their lives after graduation. The highest mean ratings were reported for off-campus employment (3.82), student publications (3.81), and intercollegiate athletics (3.65).

Preparation for the Future. As noted in the literature, one of the unique benefits of an alumni survey is the opportunity it provides for obtaining graduates' evaluation of their education based on their experience. With this in mind, survey respondents were asked to evaluate how well their undergraduate experience prepared them for their current career, future career, graduate school, social and civic involvement, and interpersonal relationships and family living. Forty percent or higher thought their undergraduate experience prepared them greatly for their current and future careers and for graduate school. In contrast, fewer than 20 percent considered that their undergraduate experience greatly prepared them for interpersonal relationships and family living and for social and civic involvement.

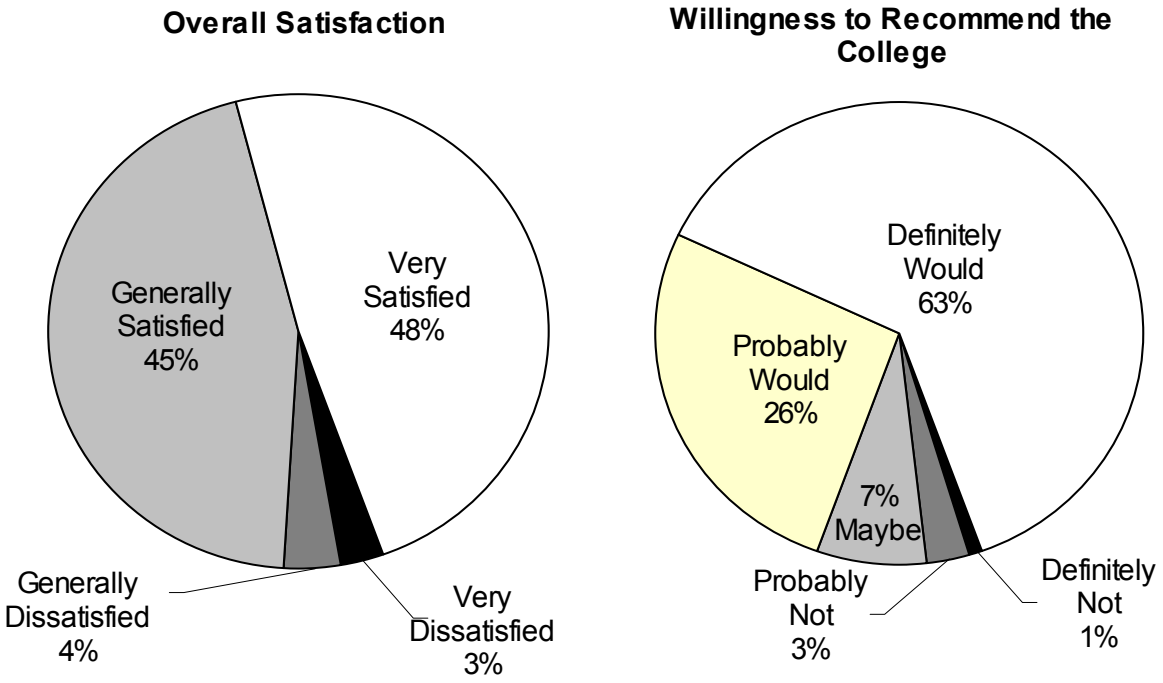
Table 2
Perceived Contribution of Involvement in College Activities to Graduates' Personal or Professional Lives

	Mean Rating				
College Activities	**Little**	**Some**	**Extensive**	**F Ratio**	**N**
Off-Campus Employment	2.43	3.05	3.82	83.85***	312
Student Publications	1.98	2.81	3.81	54.52***	101
Intercollegiate Athletics	2.03	2.82	3.65	70.16***	199
Religious Group	1.95	2.64	3.60	23.57***	77
Performing Arts or Music	2.13	2.89	3.53	44.09***	130
Fraternity or Sorority	1.17	2.13	3.50	47.68***	88
Community Service	2.23	2.76	3.48	51.63***	375
Student Club	1.93	2.65	3.46	114.58***	333
Student Government	1.75	2.68	3.39	35.68***	97
On-Campus Employment	1.93	2.53	3.37	69.79***	309
Intramural Sports	1.76	2.42	2.85	29.48***	233

*** $p \leq .001$
Note: The mean ratings are based on a scale from 1 'none' to 4 'extensive'.

Overall Evaluation of the Undergraduate Experience. Several survey questions were designed to elicit graduates' overall satisfaction with their undergraduate education and their assessment of how well the College prepared them for their career. As an indirect measure of satisfaction, alumni were also asked if they would recommend the College to a high school senior interested in pursuing a career in business. As shown in Figure 1, 93 percent of alumni were satisfied with their undergraduate education; 48 percent were 'very satisfied' and 45 percent were 'generally satisfied'. When asked how their experience might influence their decision to recommend the College to a high school senior interested in pursuing a career in business, 63 percent responded they 'definitely would' and 26 percent said they 'probably would' recommend the College. In evaluating how helpful their degree was in finding employment, 16 percent reported it was 'extremely helpful' and 37 percent indicated it was 'very helpful'. Overall, alumni responses to these questions provide positive assessment results.

Figure 1



Variation in Alumni Responses. T test analyses identified several significant differences by year of graduation, gender and citizenship in alumni assessment and satisfaction with their college experience. For example, compared with Class of 2001 graduates, Class of l999 graduates reported higher levels of satisfaction with campus life services ($t = 3.47$, $p \leq .001$); public safety ($t = 3.22$, $p \leq .001$); sense of community ($t = 4.13$, $p \leq .001$); and social life on campus ($t = 4.06$, $p \leq .001$). Particularly notable gender differences are the superior female ratings for the College's influence on drive to achieve ($t = 2.79$, $p \leq .01$), social self-confidence ($t = 2.05$, $p \leq .05$), and the ability to function effectively as a team member ($t = 2.65$, $p \leq .01$). International students rated

their undergraduate experience more positively on several items, including the influence of their education on their ability to relate well to people of different cultures ($t = 5.41$, $p \leq .001$), develop awareness of social problems ($t = 2.82$, $p \leq .01$) and acquire social self-confidence ($t = 2.75$, $p \leq .01$).

Predicting Alumni Satisfaction. Multiple regression was employed to identify significant predictors of alumni overall satisfaction with their undergraduate education. The regression was conducted in two stages. In the first stage, demographic and academic achievement variables – gender, citizenship and average grade in college - were entered as independent variables. In the second stage, assessment and satisfaction variables were added to complete the model.

Table 3 presents the results of the second model. As shown, gender, citizenship and average grade in college do not significantly predict overall satisfaction once the other variables are entered in the model. In order of effect, the significant predictors are: a positive evaluation of the preparation received for one's future career ($b = .220$); assessment of enhanced abilities to acquire new skills and knowledge ($b = .162$), communicate well orally ($b = .150$), and understand others ($b = .126$); and satisfaction with the sense of community experienced during college ($b = .101$). The beta weights indicate the effect of each independent variable on the dependent variable. For example, for every one unit change in the perception of enhanced ability to acquire new skills and knowledge, there is a corresponding .162 unit change in satisfaction. The R^2 of .27 shows that the model explains 27 percent of the variance in alumni overall satisfaction.

Table 3
Multiple Regression Results: Predicting Graduates' Overall Satisfaction

Predictors	Coefficient	t Ratio	R2	F Ratio
Demographic and Academic Variables				
Gender	.020	0.475		
Citizenship	.015	0.373		
Average Grade in College	-.033	-0.828		
Assessment and Satisfaction Variables				
Preparation for Future Career	.220	4.955***		
Enhanced Ability to Acquire New Knowledge	.162	3.472***		
Enhanced Ability to Communicate Well Orally	.150	3.343***		
Enhanced Ability to Understand Others	.126	2.774**		
Satisfaction with Sense of Community	.101	2.267**		
			.273	21.704***

** $p \leq .01$; *** $p \leq .001$

Predicting Choice of Same Institution. Multiple regression was also employed to identify significant predictors of alumni willingness to recommend the College. The regression was conducted in two stages. In the first stage, demographic and academic

achievement variables – gender, citizenship and average grade in college – were entered as independent variables. In the second stage, assessment and satisfaction variables were added to complete the model. Table 4 presents the results for both models one and two. As shown, in model one, citizenship and average college grade significantly predicted willingness to recommend the College. The beta weights were .118 for citizenship and -.098 for average grade in college, indicating that non-U.S. citizens and students with higher grades were more satisfied. As indicated by the R^2, these variables explain 3 percent of the variance in alumni willingness to recommend the College.

Results from the second stage of the regression analysis reveal that the demographic and academic achievement variables do not significantly predict alumni willingness to recommend the College once the assessment and satisfaction variables are added to the model. The significant predictors are: the perception of enhanced drive to achieve (*b* = .285); satisfaction with social life during college (*b* = .271); enhanced ability to acquire new knowledge (*b* = .170); and perceived gain in knowledge (*b* = .137). The R^2 of .366 for the total model indicates that these variables explain 37 percent of the variance in alumni willingness to recommend the College to a high school senior interested in pursuing a career in business.

Table 4. Multiple Regression Results:
Predicting Alumni Willingness to Recommend the College

Predictors	Beta Coefficient	t Ratio	R2	F Ratio
Model 1				
Gender	.058	1.279		
Citizenship	.118	2.619**		
Average Grade in College	-.098	-2.160*		
			0.029	4.779**
Model 2				
Gender	-.051	-1.339		
Citizenship	.063	1.694		
Average Grade in College	-.034	-.929		
Enhanced Drive to Achieve	.285	6.811***		
Satisfaction with Social Life	.271	6.909***		
Enhanced Ability to Acquire New Knowledge	.170	3.955***		
Enhanced Gain in In-Depth Knowledge	.137	3.233***		
* p < .05; ** p < .01; *** p < .001			.366	38.981***

Recommendations

Based on the research findings, the study concluded with a set of policy recommendations focused on areas for improvement and strengths. Illustrative recommendations for improvement include: encourage students to participate more fully

in extracurricular activities; intensify the educational focus on understanding ethical issues, social problems and people of different cultures; and offer students more opportunities to develop self-understanding, and understanding of others. Recommendations designed to exploit the College's strengths include: publicize the College's success in developing students' abilities critical to success in business; promote the college as an institution that gives graduates the skills necessary for life-long learning; publicize graduates' high level of satisfaction with business courses and the faculty; and continue investing in computer and library services as essential resources for students' education and preparation for success in business.

Discussion

This paper presents a model for designing alumni research studies to assess higher education's effectiveness in educating students and preparing them for their lives after graduation. Two major areas addressed are satisfaction and perceived growth attributed to the college experience, both critical to the quality of students' experience and the success of higher education institutions (Hartman & Schmidt, l995; Pearson, l999; and Martin et al., 2000). Consistent with the principles of good practice in assessment, the survey for this study was designed to reflect the goals of the undergraduate curriculum (AAHE, l992 and Banta et al., l996). Following the example of Volkwein and Bian (l999), the study was initiated as a major component of the College's assessment program.

With the focus on inviting alumni to provide critical assessments of how well the college prepared them for their lives after graduation, this study reflects the emphasis in a 'new era of alumni research' (Pettit & Litten, l999). In seeking alumni assessment of their educational experience, the study recognizes the significant investment involved in a college education and provides graduates an opportunity to evaluate this investment (McGuire & Case, l999).

Results from this study have implications for the study College as well as for other higher education institutions. Multiple regression identified the following significant predictors of graduates' overall satisfaction: satisfaction with a sense of community during college; satisfaction with preparation for one's future career; and the perception of enhanced abilities to acquire new knowledge, communicate well orally and understand others. These results indicate that graduates evaluate their education through the prism of different aspects of their experience: the quality of community life during college; the adequacy of professional career preparation; and enhanced capacity for life-long learning and relating with others.

The study also identified the following significant predictors of graduates' willingness to recommend the College to a high school senior: satisfaction with social life, enhanced drive to achieve, improved ability to acquire new knowledge, and increased gains in in-depth knowledge. These findings reveal that graduates consider social, academic, career and life enrichment aspects of their experience in determining whether or not to recommend their college.

Results from both regressions - predicting satisfaction and willingness to recommend the College - highlight the significant factors that graduates consider in their evaluation of their college experience. The quality of social life and sense of community is critical. Effective preparation for one's career is crucial, and the capacity for continued learning and relating well with others is considered vital. A major implication of these results is that the College needs to achieve success in these areas in order to realize the goals of optimum alumni satisfaction and enhanced influence on graduates' lives.

Conclusion

This study identified the importance of a vibrant social life, excellent career preparation, and an enhanced capacity for life long learning to graduates' overall evaluation. Findings from this study may be used to generate hypotheses for future alumni studies, and the recommendations offer potential strategies for other higher education institutions seeking to increase graduates' satisfaction and enhance the institution's influence on graduates' lives. The methodology, design of the instrument, implementation strategies, analytical techniques and strategic policy recommendations provide a model for institutional researchers designing alumni research to meet the challenges and responsibilities of assessment and accreditation.

References

American Association for Higher Education (l992). *Principles of good practice for assessing student learning.* Washington, D.C.: AAHE.

Banta, T.W., Lund, J.P., Black, K.E., & Oblander, F.W. (l996). *Assessment in practice.* San Francisco: Jossey-Bass.

Hartman, D.E. & Schmidt, S.L. (l995). Understanding student/alumni satisfaction from a consumer's perspective: The effects of institutional performance and program outcomes. *Research in Higher Education 36*(2), 197-217.

Jennings, E.T. (1989). Accountability, program quality, outcome assessment, and graduate education for public affairs and administration. *Public Administration Review 49*(5), 438-446.

Khalil, E.M. (Ed.). (l990). *Academic review of graduate programs: A policy statement.* Washington, DC: Council of Graduate Schools. (ERIC Document Reproduction Service No. ED 331 421)

Martin, A.J., Milne-Home, J., Barrett, J., Spalding, E., & Jones, G. (2000). Graduate satisfaction with university and perceived employment preparation. *Journal of Education and Work 13*(2), 199-213.

McGuire, M.D., & Casey, J.P. (l999). Using comparative alumni data for policy

analysis and institutional assessment. *New Directions for Institutional Research 26*(1), 81-99.

Park, L.J. (l994). Good accounting skills: What more does a successful accountant need? *Journal of Education for Business 69*(4), 231-234.

Pearson, J. (l999). Comprehensive research on alumni relationships: Four years of market research at Stanford University. *New Directions for Institutional Research 26*(1), 5-21.

Pettit, J., & Litten, L.H. (Eds.). (l999). A new era of alumni research: Improving institutional performance and better serving alumni. *New Directions for Institutional Research 26*(1).

Pike, G.R. (l990, April). *Dimensions of alumni perceptions of cognitive and affective growth during college.* Paper presented at the annual meeting of the American Educational Research Association, Boston.

Williford, A.M., & Moden, G.O. (1989, May). *Using alumni outcomes research in academic planning.* Paper presented at the annual forum of the Association for Institutional Research, Baltimore.

Volkwein, J.F. & Bian, F. (l999). Would alumni do it all again? In D. Shoemaker (Ed.), *Research in alumni relations: Surveying alumni to improve your programs*. Report on the Association for Institutional Research (AIR)/CASE Alumni Research Conference, April 2-3, l998 (pp. 122-129). Washington, D.C.: Council for Advancement and Support of Education. (ERIC Document Reproduction Service No. ED 434 613).

BEYOND THE ACCOUNTABILITY-IMPROVEMENT DEBATE: A CASE STUDY ANALYSIS

Kathryn Doherty
Coordinator, Office of Learning Outcomes Assessment
Howard Community College

Background and Literature Review

The effectiveness of higher education in the United States has been the subject of an ongoing debate that remains at the forefront of discussions and decisions about higher education policy and practice today. The extent of this attention is not difficult to understand in light of the importance of higher education to society (Wellman, 1999). Yet for all its prominence, higher education struggles amid concerns over quality, costs, efficiency, student learning, and core curricula at colleges and universities across the country. To address these concerns and answer critics, institutions have turned increasingly to academic assessment as a means to both document improvement and demonstrate positive outcomes. Assessment can be used to evaluate the effectiveness of teaching and the extent of learning or to identify and address areas of strength and weakness in campus programs, or both. While the reasons that guide an institution's decision to assess its programs vary, most are shaped by three general forces that make up the conceptual framework of this study: the context in which assessment occurs; intervening conditions that impact assessment; and actions and interactions that occur in response to or as a result of assessment. The extent to which these forces drive institutional assessment defines the nature of assessment on campus.

Building on the premise that an institution's assessment policy is driven by one or more of the three forces outlined above, this study explores the relationship among the three and the ways in which they impact assessment on campus. It also looks at the intersection of these forces along an accountability-improvement continuum and will argue that the point of intersection for any institution will vary, as each arrives at its own balance in response to the internal and external variables that influence this mix.

Assessment methods, models, and implementation strategies have been the topic of countless articles and books from which a candy shop variety of approaches, explanations and cautions may be drawn. Growing out of Dressel (1957) and Astin's (1977) work focusing on evaluation of higher education and student outcomes, beliefs and knowledge, and Banta (1991, 1996), Cross (1983, 1986), and Palomba's (1997) benchmark research on classroom and institutional assessment, researchers have built on the innovative work at Alverno College and other institutions at the forefront of the assessment movement throughout the 80s and 90s to explore how successful assessment works and how it can be duplicated at colleges and universities who struggle with design and implementation. Much of the literature has focused on assessment for improvement or assessment for accountability, with less written about the merger of the two and less that explores the nature of assessment beyond this relationship. Three exceptions are the

research that addresses the ways in which improvement grows almost unintentionally from accountability (Ruppert, 1998); Newton's (2000) recent study on how to manage the tension between accountability and improvement that suggests it is an institution-specific mix of the two that may be most beneficial to today's colleges and universities; and Peterson's work with Augustine (2000) and Gronlund (2002) that uses quantitative research to examine the variables that impact assessment on campus. The first two remain locked into a common separation of accountability and improvement. Peterson's studies, however, begin to move away from the accountability-improvement discussion to look at institution-specific factors that influence the nature and direction of assessment.

Objectives and Methodology

This study will build from Newton's suggestion of the importance of institutional mix to demonstrate that assessment in higher education is not an "either-or" model and from Peterson's work to identify and measure institutional variables. It proposes that assessment is an open-ended response to institution-specific priorities and mandates that would benefit from a more clear understanding of the impact of these variables on assessment policy and practice. It attempts through case study research to shed some light on the ways in which assessment is designed and implemented on college campuses while avoiding the rigid categorization (i.e., accountability or improvement) that often colors this type of research and drawing from the literature five institutional factors that shape assessment on any given campus: culture, leadership, organization, data results and use, and campus community.

Beginning with the assumption that assessment is unique to individual institutions and characterized by the institution's campus-specific response to internal and external variables that shape its assessment policy and practice, this study builds from a theoretical base that combines historical context, assessment in practice, and current research in the field. The central research question is whether *the current assessment framework that suggests an accountability versus improvement distinction fully captures the reality of institutional responses to assessment.* The purpose of this study is to examine assessment at three institutions. Case study methodology with a focus on institution-specific factors derived from the literature will address the critique of previous research's "lack of [campus-] specific information" (Walker, 1997, p. 443) as well as the need to use existing research as a base to examine how policies are being implemented at the institutional level (Ruppert, 1999) and is intended to increase our understanding of assessment as it plays out on campus. The two main contributions of this study are (1) an examination of institution-specific factors that impact the assessment mix; and (2) the development of another way to think about assessment that broadens the accountability-improvement discussion to include other variables that also impact assessment on campus.

Using qualitative methods, this study explores the factors that influence assessment at three schools and how each school approaches institutional assessment. Case study analysis is used to collect and classify data, to describe, and to make inferences about what the data reveal. The intent is to develop the foundation for a

grounded theory of institutional assessment based in the data collected from this study and derived from the evidence in the research, the categories that are generated by the evidence, and the concepts that emerge from the categories (Glaser & Strauss, 1996). The case study method will support this approach A two step process is planned; (1) analysis of documents to provide a grounded base for the study and (2) research through interviews to support the base of the data. This paper addresses step one of this process.

The design for this study is a combination of descriptive and explanatory research through case analysis using a grounded theory approach. Descriptive research is "a type of investigation that measures the characteristics of a sample or a population on pre-specified variables" or a "detailed portrayal of one or more cases" (Gall, et al, 1996, p. 757). Explanatory research is framed by theory, or an "explanation of a certain set of observed phenomena in terms of a system of constructs [variables]…that relate these concepts to each other" (p. 8). The sample for this study is three institutions, selected on the basis of three criteria: (1) they demonstrate the internal and external demands identified for this study as impacting assessment; (2) they offer the opportunity to gather rich data through website and paper documents; and (3) they exhibit an assessment mandate through formal institutional assessment programs, requirements or examples. Document analysis is the primary methodology for step one of this study. Document analysis is "a research technique for the objective, systematic, and quantitative description of the manifest content of communication" (Gall, et al, p. 357). Documents were selected for this study using three general criteria to ensure that the data collected from the documents are relevant to this study. These criteria include the document's (1) ability to support the conceptual framework of this study; i.e., relevant to the context, intervening conditions and structure, and actions that impact assessment on campus and the institution-specific factors (culture, leadership, organizational structure, data collection and use, and campus community) identified in the literature review and inherent in that framework; (2) linkage to the research questions and assumptions that guide this study; and (3) ease of access for the researcher in obtaining the documents. Using this pre-determined document selection criteria, the document selection process began with a review of both on-line and hard copy documents. And involved three steps: 1) on-line search; 2) hard-copy search; 3) interview search. Once selected, these documents were then analyzed to provide data to support the conceptual framework upon which this study is based and coded according to their relevance to the external events, intervening conditions and actions/interactions that impact assessment on campus. The results of this analysis are presented in the next section.

Results and Analysis

Document analysis for this study generated data in four areas: (1) background information about each of the three institutions in this study; (2)data that describe the ways in which the five institutional-specific variables (culture and climate, leadership, organizational structure, data collection and use, and campus community) identified through the literature review conducted for this study; (3) data that position each campus within the conceptual framework of this study; and (4) data that begin to answer the research questions that guide this work.

In looking at background information for each of the three campuses included in this study, the similarities and differences are clear. Two are public and one is private. One is large, one medium, and one small. One is denominational and formerly single-sex. Two are four-year universities and one is a two-year college. Two are in the mid-Atlantic states and one is in the South. All are diverse and two have large international populations. Two offer bachelor and master degrees and one offers associate degrees. All three are led by a Board and a President and each has organizational levels representing main units on campus. All have separate assessment offices but two report to academic affairs while one reports to research and planning. Data from each campus is discussed below.

Campus One is located on 320 acres in a suburban area of a mid-Atlantic state. The university's mission is to prepare students in the academic disciplines. It is accredited by the regional accrediting body and a number of professional and national accreditation councils and boards. The campus is also accountable to the state Board of Higher Education and the state Legislature and is guided by eleven strategic goals related to excellence, teaching, learning, delivery systems, and outreach. Priorities for the 02-03 academic year included technology infrastructure, academic programs, the teaching and learning environment, and academic and professional outreach. Campus One is the second largest university in its state, enrolling more than 16,000 students, including international students from 100 countries. 10,000 of these students are full-time and over 2,800 are part time. 2,000 students are enrolled in graduate programs. Campus One is governed as part of the state university system and guided by a campus President. Vice presidents report to the president in the areas of Academic Affairs, Finance, Information Technology, and Student Services. A Provost is the Chief Academic Officer. Academic Divisions are led by Deans and departments are overseen by department and program Chairs. The Director of Assessment reports directly to the Provost. There is a standing University Assessment Council that reviews programs and provides guidance for the assessment process as a whole.

Campus Two is a medium size public two-year institution located in a suburban area of a mid-Atlantic state. The college enrolls 5,000 students each year in a variety of academic programs that lead to either transfer to four-year institutions or employment after graduation. There are an additional 12,000 who take courses for personal or professional development. Conveniently located between two major metropolitan areas, the 120-acre wooded campus enrolls about 43% of all area high school graduates and is recognized as an institution offering a high-quality education at reasonable cost. The college is accredited by the regional accrediting body and by professional associations relevant to the individual academic disciplines. The campus is also accountable to the state Board of Higher Education, the state Legislature, and the county governing board of the county in which it is located and from which it receives a large portion of its funding. Campus Two was founded in 1966 and began classes in 1970. The college offers a wide range of academic pursuits and extra-curricular activities. It bills itself as a dynamic, creative learning community that provides innovative solutions to a diverse student population. With a mission of inspiring learning and the lifelong pursuit of personal and

professional goals, the campus places emphasis on education, students, employees, staff, community, fairness and freedom. In the spring of 2003, Campus two enrolled 5,800 credit students with 32% full time and 68% part time. There were 3,454 students enrolled in six transfer programs and 1,346 in sixteen occupational (career) programs. Campus Two is guided by six strategic initiatives: learning community, access, economic and workforce development, partnerships, organizational excellence, and growth. As a public institution, the campus is led by a President who reports to an independent Board of Directors. There are four Vice Presidents who report to the President as well as an Executive Director of Planning, Research and Organizational Development, a Director of Public Relations and a Director of Legislative and Business Development. Four areas of the organization report to the Vice Presidents: Academic Affairs, Finance, Student Services, and Information Technology. There are seven academic divisions (Arts and Humanities, Business and Computers, English and World Languages, Health Sciences, Mathematics, Science and Technology, and Social Sciences), as well as distance learning, continuing education, and international education. The Coordinator of Assessment reports to the Executive Director of Planning, Research and Organizational Development.

Campus Three is a medium-sized, private denominational four-year college located in a suburban neighborhood in a southern state It is a comprehensive, coeducational university located just minutes from a major metropolitan area. The mission of Campus Three is to combine a liberal arts tradition with career preparation and to foster the intellectual, moral, spiritual, social, cultural and physical development of its students. The university is guided by seven strategic initiatives: academic excellence, denominational identity, enrollment and retention, student life, university advancement, fiscal and operational management, and the campus master plan. Campus Three was founded in 1950 by a denominational order as a two-year women's college offering the associate degree. It became a four-year college in 1973 offering 20 bachelor's degree programs. Male students were admitted in 1972 and master's degree programs were added in 1979. University status was granted in 1986. In the 02-03 academic year, Campus Three enrolled 3,751 students, with 2,204 undergraduates and 1,547 graduates. Forty-three states and 86 countries were represented. Total on-campus residents were 663. Campus Three is accredited by the regional accrediting body and by a number of professional and program-based accreditation associations. As a private institution, Campus Three is led by a President and a Board of Trustees selected by the denominational order under whose philosophy the campus grew and evolved. Four Vice Presidents report to the President and the combined Office of Institutional Research and Assessment reports directly to the Vice President for Academic Affairs.

In addition to providing background information for this study, document analysis results also demonstrated that each of the institution-specific factors identified for this study contribute to the role and impact on assessment on campus. Institution-specific factors provided information about the ways in which each campus responds to and approaches assessment. These factors include culture, leadership, organizational structure, data collection and use, and campus community. This impact is different on each campus, however, supporting the thesis that assessment is most effectively

described not by generalities and boilerplate models (accountability or improvement, to name two) but by the impact of "institution-specific" factors identified and explored in the context of the institution itself. Table 4-1 summarizes the document analysis data relevant to these institutional factors.

Table 4-1: Institution-Specific Factors

Category	Campus One	Campus Two	Campus Three
Culture	**Comprehensive** Required assessment Teaching focus Learning environment Excellence	**Dynamic** Creative Challenges Innovative Values and beliefs	Foster Development Peer Excellence Preparation
Leadership	**Structure** Representative Constituencies External relationships Shared	**Involved** Core work Policies Procedures	Partnership Common Contribution Standards Implementation
Organizational structure	**Stakeholders** Review and evaluation Assessment structure Master plan	**Agile** Responsive Empowering Improvement Accountability	Interactive Institutional practice Partnership Model Strategic planning
Data collection and results	**Planning and budget** Allocation of resources Strategic initiatives Requirements Non-punitive Developmental	**Accountability** Integral Outcomes Measure Change Improve Non-punitive	Ongoing Strategic Research Measures Action
Campus community	**Relationships** External Future agenda Stakeholders and constituencies	**Ownership** Responsibility Positive force Nurture Opportunities	Support Join Commitment Development Tradition

As these document analysis results demonstrate, each of the institution-specific factors identified for this study contribute to the role and impact on assessment on campus. This impact is different on each campus, however, supporting the thesis that assessment is most effectively described not by generalities and boilerplate models (accountability or improvement, to name two) but by the impact of "institution-specific" factors identified and explored in the context of the institution itself. Understanding the role of institutional factors on each campus will help to generate data that will contribute to the development of a grounded theory of institutional assessment applicable to each of the three campuses in the study.

After background data and institutional factors, relevance to the conceptual framework that guides this study is a third data grouping that emerged from the document analysis. The conceptual framework considers the impact of context, intervening conditions, and actions/interactions of a campus on the nature and shape of assessment on that campus. Table 4-2 summarizes the data that were collected through document analysis in support of the conceptual framework of this study.

Table 4-2: Conceptual Framework Data

Category	Campus One	Campus Two	Campus Three
Context	**Campus-wide Requirements** Certification cycle Accreditation Master plan Self-study analysis	**Student goals** Community leader Partnerships External input External opportunities Service External reporting	Accreditation Certification External reporting Peer institutions External reporting National databases
Intervening conditions	**Faculty roles** Assessment climate Review and evaluation **Structure for assessing** Campus governance Planning	**Standards** Process/cycle Involvement Benchmarking Value-driven Ideas exchange	Institutional support All levels Institutional practice Strategies and plans Resources Interactive model Search for data
Actions and interactions	**Tools and strategies** Methods Principles of assessment Reward and recognition Institution-wide Accreditation requirements	**Community** Innovations Improvement Experimentation Communication Accountability Continuous improvement	Assistance and services Benefits of assessment Faculty development Effective response Accountability Formal process

Results from this part of the document analysis revealed document relevance by category, by word pattern and by overall relevance to the conceptual framework of this study. These results provided a basis for and support of the development of a grounded theory of assessment to describe assessment at each of the three campuses in the study.

The fourth area of data generated by the document analysis results was the value of these data in addressing the research question on which this study is based. As discussed earlier, there are three research questions that this study seeks to answer: (1) How do external events and expectations frame assessment on campus; (2) how do campus conditions and structure impact assessment on campus; and (3) in what ways does a campus respond to, manage, and carry out assessment. Finding answers to these questions moves the study into the third phase of grounded theory development. Document analysis reveals that 19% of documents in this analysis provide data for the

first research question; 44% of documents address the second research question, and 37% of documents in this study support the third research question. Table 4-3 summarizes these data.

Table 4-3: Research Question by Campus

Question	Campus One	Campus Two	Campus Three
How Do External Events and Expectations Frame Assessment on Campus?	**Align with constituencies** Master plan Regional self-study Certifications "Premiere" institution Broad support for teaching and learning	**Contribute to community** Vibrant partnerships Model of excellence Input from external groups Positive force in community	**Regional and professional accreditation** External reporting Peer institutions External comparisons National databases
How Do Campus Conditions and Structure Impact Assessment on Campus?	**Assessment office assists faculty** Structure for assessment "Climate" for assessment Strong shared governance Committee review of assessment	**Institution-wide assessment** Classroom assessment Scholarship of assessment Defining and benchmarking Agile organization Striving for bold improvements	**Students first** Academic excellence Assessment office support and resources Assessment cycle with feedback Institutional partnerships Annual review
In What Ways Does a Campus Respond To, Manage, and Carry Out Assessment?	**Best practice** Reward and acknowledgement Review and evaluation policies Campus-wide standards Ongoing process Systematized	**Internal/external assessment** Standardized handbook Assessment guidelines Assessment benefits Resources and supports	**Faculty development workshops** Development and implementation Assessment in response to calls for accountability and improvement

The four areas of data derived through document analysis suggest that for each campus response to assessment is related more to institution-specific factors, structures, actions and interactions than to the external events (context) that might influence assessment. The extent to which each of these impact an institution influences the institution's position along the accountability-improvement continuum (i.e., closer to assessment for accountability, closer to assessment for improvement, etc.). Figure 4-1 illustrates the relationship of institution-specific factors, conceptual framework, and research questions as defined through document analysis, to the location of an institution along the accountability-improvement continuum.

Following initial document analysis at each level (category, conceptual framework & institutional factors, and research questions) data were then applied to

development of a grounded theory. At this point in the study, documents had been reviewed by category, by conceptual framework and institution-specific factors, and by research questions. At the first level of document analysis, review by category, grounded theory development looks at codes, conceptual labels, and classification into categories. At the second level of document analysis, review by framework and institution-specific factors, grounded theory development adds in examining, comparing, conceptualizing, and matching the document analysis data from level one to the conceptual framework of the study and to the institution-specific factors identified in the literature. At the third level of document analysis, review by research questions, grounded theory development begins integrating data, making connections, applying results, and identifying the need for additional data. Figure 4-2 illustrates this process. During development of the grounded theory for institutional assessment emerging from this study, data were collected and applied to this development. Table 4-4 Presents distribution of data organized by process and development level.

Conclusion

Moving through these three levels of analysis, data were collected and analyzed to complete the first step of the two step process on which this study has been based. Descriptive data had been collected and applied to the development of a grounded theory of instructional assessment. Initial results suggest direct relationships among institution-specific factors that the location of a campus in relation to accountability and improvement. Data also suggest that the current assessment framework that suggest an accountability versus improvement distinction *does not fully* capture the reality of institutional responses to assessment and point more convincingly to the impact of the five institution-specific factors (culture, leadership, organizational structure, data collection and use of results, and campus community) on the shape and nature of assessment on each campus. These results imply that institutional location along the accountability-improvement location is more related to the influence of these factors than to pre-defined parameters anecdotally associated with accountability, improvement and assessment, pointing to the beginning formulation of a grounded theory of institutional assessment where the inputs are these factors tempered by conceptual framework and institutional background and the outputs are the answers to the research question that guides this study. As in any effective grounded theory research, these initial data results must be re-evaluated and re-applied to both integrate the results more fully and apply them more directly to the research problem at hand. Step two of this study, not discussed in this paper, begins with the collection of explanatory data through one-on-one interviews with representatives from the three campuses in the study and continues with the application of interview response to the initial grounded theory and to the research question. Particular emphasis will be collecting data to support the preliminary finding of the importance of institution-specific factors over generic accountability-improvement parameters in determining campus response to assessment.

Figure 4–1: Relationship Among Institution-Specific Factors, Conceptual Framework, and Research Questions As Defined Through Document Analysis: Institution Location Along the Accountability-Improvement Continuum

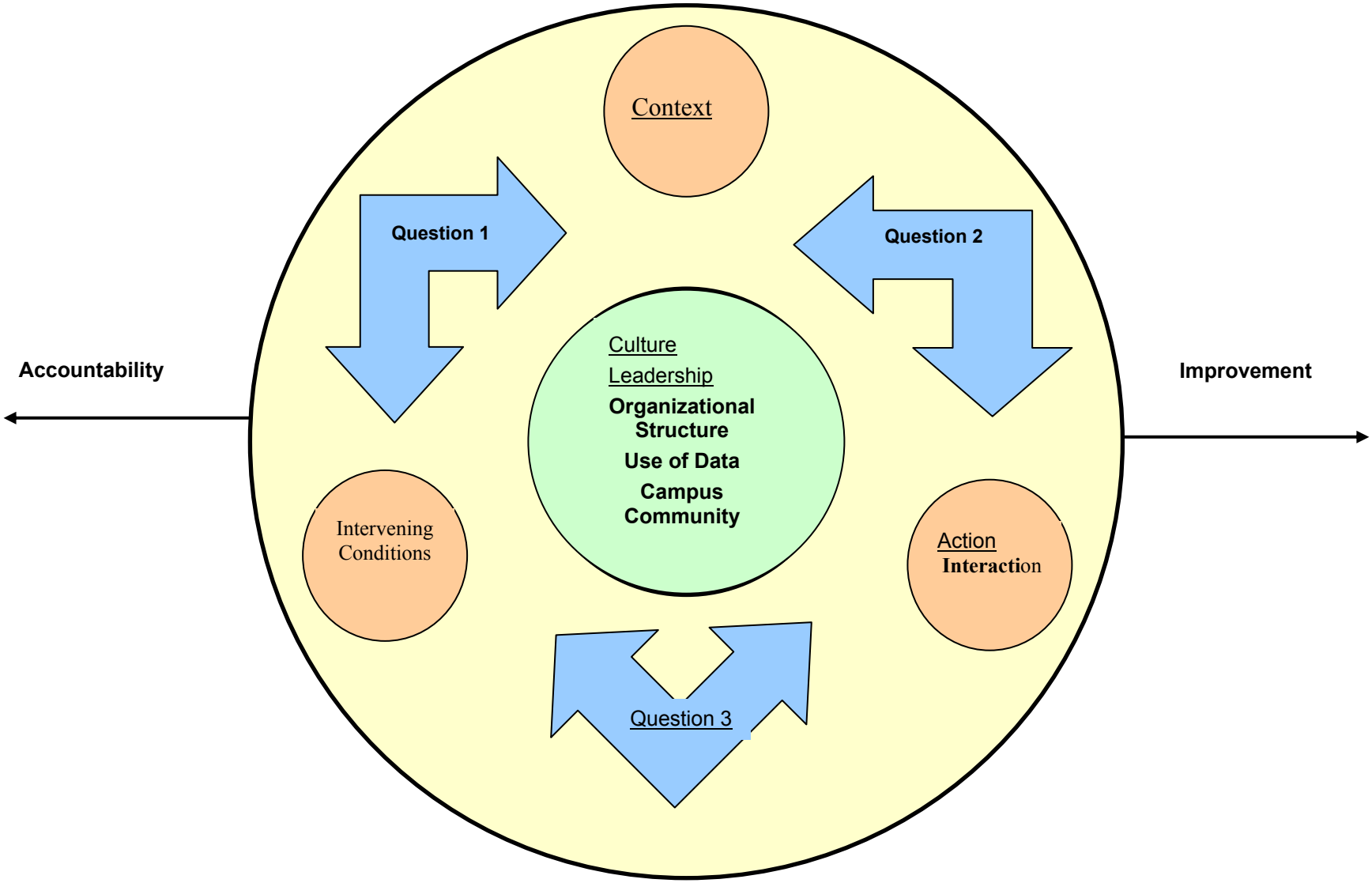


Figure 4-2: Development of a Grounded Theory of Institutional Assessment – Document Analysis

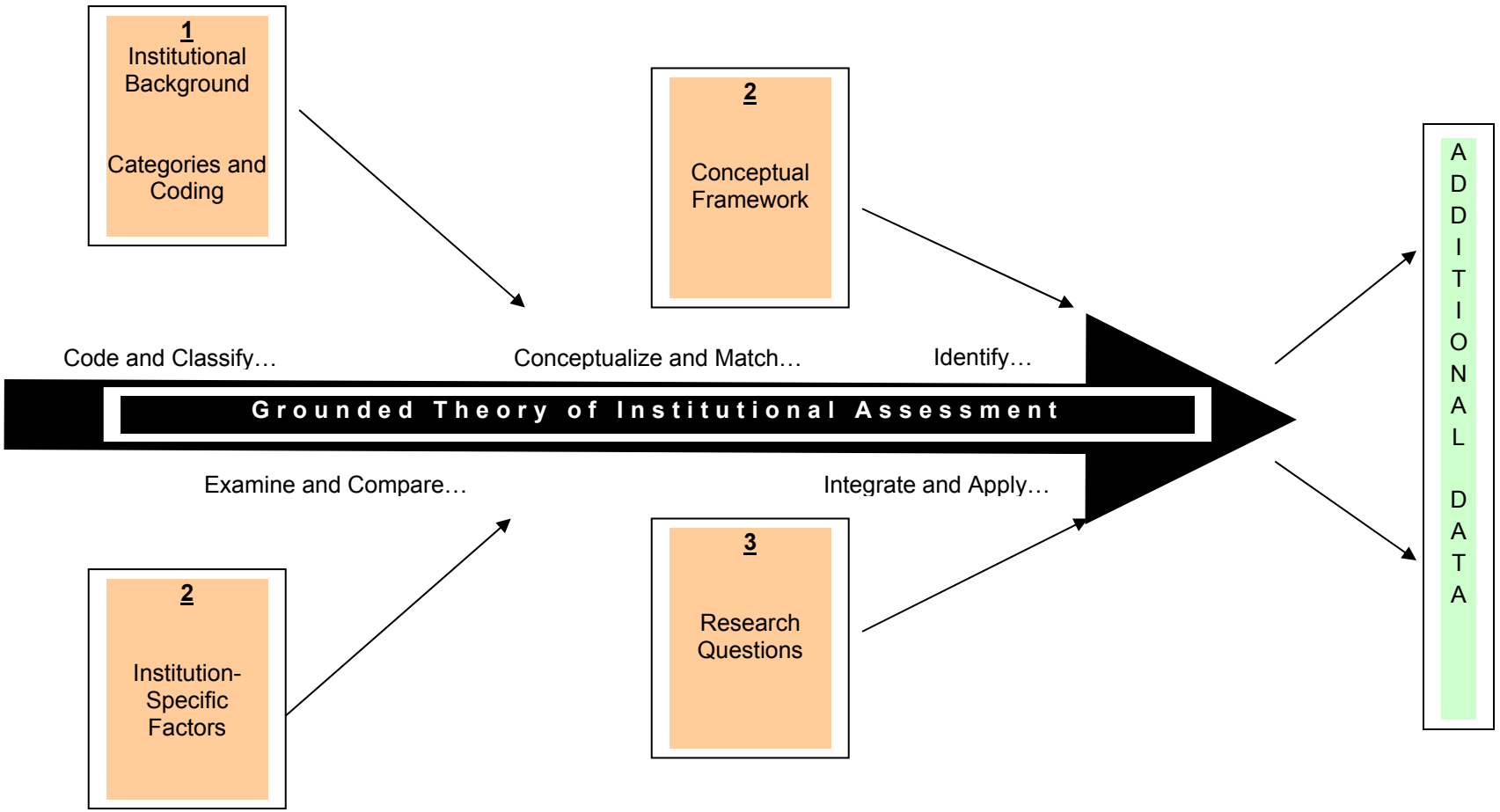


Table 4-4: Grounded Theory Data by Process and Development Level

Grounded Theory Process		Campus One	Campus Two	Campus Three
Code and Classify				
Categories	**Describing**	Overlay	Integration	Compartmental
	Explaining			
	Responding			
Examine and Compare				
Institutional Factors	**Culture**	Centralized	Organic	Outreach
	Leadership	Established	Flexible	Traditional
	Organization	Hierarchy	Horizontal	Vertical
	Data	Tipped toward accountability	Balance of accountability and improvement	Tipped toward accountability
	Community	Central core, outer ring	Expanding circle	Closed circle
Conceptualize and Match				
Conceptual Framework	**Context**	External focus	External/Internal	External focus
	Intervening Conditions	Structured	Process-oriented	Structured
	Actions & Interactions	Proactive	Formative	Reactive
Integrate and Apply				
Research Questions	**Question 1**	Structured framework	Organic framework	External framework
	Question 2	Focus on cycles	Focus on performance and improvement	Focus on performance and accountability
	Question 3	Do-review-acknowledge-reward-recycle	Support-do-implement-improve-redo	Do-report-do

References

Astin, A. W. (1977). *Four critical years: Effects of college on beliefs, attitudes, and knowledge*. San Francisco: Jossey-Bass.

Banta, T. W. (1991). Contemporary approaches to assessing student achievement of general education outcomes. *Journal of General Education 40*, 203-223.

Banta, T. W. (1996). *Assessment in practice: Putting principles to work on college campuses.* San Francisco: Jossey-Bass.

Cross, K. P. (1983). Improving the quality of instruction. In A. Levine (Ed.), *Higher learning in America, 1980 – 2000* (pp. 287-308). Baltimore: The Johns Hopkins University.

Cross, K. P. (1996). *Classroom research: Implementing the scholarship of teaching.* San Francisco: Jossey-Bass.

Dressel, P. L., & Mayhew, L.B. (1954). *General education: Explorations in evaluation.* Washington, DC: American Council on Eudcation.

Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research : An introduction* (6th ed.). White Plains, NY: Longman.

Glaser, B. G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.

Gronlund, N.E. (1998). *Assessment of student achievement* (6th ed.). Boston: Allyn & Bacon.

Newton, J. (2000). *Strategic management of quality and the challenge of the new millennium: Prospects for managing the tension between accountability and improvement in further and higher education.* (ERIC Document Reproduction Sevice No. ED 447 286, CE 080 920), pp. 1-29.

Palomba, C. A. (Winter 1997). Assessment at Ball State University. *New Directions for Higher Education 25*(4), pp. 31-45.

Peterson, M. W. & Augustine, C. H. (2000, August). External and internal influences on institutional approaches to student assessment: accountability or improvement? *Research in Higher Education, 41*(4), pp. 443-479.

Ruppert, S. S. (1998). *Focus on the customer: A new approach to state-level accountability reporting and processes for higher education.* (ERIC Document ED 421, HE 031 407), pp. 1-19.

Wellman, J. V. (1999). *Contributing to the civic good: Assessing and accounting for the civic contributions of higher education.* Washington, DC: Institute for Higher Education Policy.

TENURE-TRACK PROGRESSION OF ASSISTANT PROFESSORS

Michael J. Dooris
Director, Planning Research & Assessment
Office of Planning and Institutional Assessment
The Pennsylvania State University

Introduction

Much that is written about tenure offers career advice or presents ideological points of view. Basic factual information on straightforward matters can be surprisingly hard to find.

This paper tries to answer one simple question: "What proportion of assistant professors entering the tenure-track actually achieve tenure?" The study addresses that question primarily, although not exclusively, from the perspective of doctoral/research universities. The analysis uses institutional research on tenure rates for one large research university – Penn State – supplemented with other information, mostly from studies at several comparable institutions.

Context

The year 2003 marks the sixth consecutive year in which institutional research staff at Penn State have produced an annual report on the rates at which provisionally appointed faculty achieve tenure. Each year, the provost's office shares the most recent analysis with Penn State's deans and with the University Faculty Senate.

Requests for institutional research on this question can be traced in part to a request in the mid-1990s by the Penn State Board of Trustees for a workshop on the topic of tenure. Since that time, there has been mild but continued interest on the part of central administration and the faculty. Those constituencies are interested in overall success rates, in how those rates differ among colleges or campuses and for various demographic groups, and in how Penn State compares to other universities.

The mid-1990s saw fairly intense discussion about these matters all across higher education. In 1997, Harvard's Richard Chait, who has been outspoken about (and in many respects critical of) the institution of tenure, wrote, "Tenure has become the academy's version of the abortion issue – a controversy marked by passion, polemics, and hardened convictions" (1997).

Debates and discussions continue, although their intensity probably hasn't increased since the late 1990s. The timeliness of the topic can be gauged at least approximately by activity in the relevant literature. An October 2003 ERIC search for journal articles with the keyword "tenure" found an average of 71 articles per year for each of the last ten full years, with a peak of 90 citations in 1997, as shown below.

Number of ERIC citations for English-language journal articles with keyword "tenure"

1993	55	1998	77	
1994	59	1999	75	
1995	60	2000	85	average = 71 per year
1996	70	2001	83	
1997	90	2002	53	

Methodological Alternatives for Analyzing Tenure Rates

To address factual questions about tenure rates, institutional researchers typically choose from among at least three different approaches.

The first and most familiar method simply provides a snapshot of the percentage of total faculty who are tenured. This figure of course can vary considerably across institutional types, by institution, and even among schools within an institution, but it is usually readily available for a given college or university. This is also the approach for which benchmarks are most accessible. The National Survey on Postsecondary Faculty, for example, shows that nationally 55 percent of full-time faculty are tenured (Lee, 2001). Snapshots such as this, while descriptive, say little about the rigor of the tenure process, or about the probability that an individual entering the process will eventually emerge with tenure.

The second approach examines the proportion of end-point decisions that result in the awarding of tenure. For example, at Penn State, the provost's office does track this figure, and the average rate is consistently above 90 percent. In 2002-03, 96 percent (71 of 74) of the sixth-year cases that Penn State reviewed resulted in recommendations for tenure. Similarly, the figure at many other colleges and universities is usually in the vicinity of 90 percent. While this is reasonable, basic institutional self-knowledge, taken alone it is not especially revealing. It only captures final decisions, without providing information about the attrition of faculty members who for whatever reason exited before reaching that point. In isolation, the indicator says little about the rigor of the process overall, or the likelihood that a newly appointed assistant professor will or will not achieve tenure at some point in the future.

A third approach, which this paper emphasizes, tracks one or more cohorts of newly appointed assistant professors over a period of seven years or so, to reveal their success rates in gaining tenure. Such cohort studies are more complex than either of the options described above, but they are nonetheless manageable for IR staff with access to longitudinal institutional data.

Of course, as is often the case, it would help to relate a single college or university's tenure-success rates to valid external benchmarks. Unfortunately, there are few comparative studies on this topic in the literature, and applicable data exchange conventions have not been established. However, some peer information is available; in addition to presenting detailed data

for Penn State, this paper summarizes comparable information from the University of Missouri (Eimers, 1995), the University of Minnesota (Jones & Hoenack, 1992), Stanford University (Robinson, 1999), the University of Wisconsin-Madison (Harrigan, 1997), and Miami University of Ohio (Krallman, 2003).

Distribution of Penn State's Faculty

Penn State employs approximately 5,500 academic FTE faculty (including part-time faculty and graduate assistants). There are approximately 4,300 headcount full-time faculty members. Of these, about 2,600 are either tenured or on the tenure track. The following data are University-wide counts for full-time faculty in Fall 2002.

Tenured	1,718	(40%)
Provisional	853	(20%)
Other	1,776	(41%)
Total	4,347	(100%)

(Source: Penn State, 2003)

Tenure-Track Progression of Penn State Assistant Professors

As shown in Table 1, in any given year, about 100 to 150 faculty members enter provisional status at Penn State. For the last six entering cohorts who have had time to progress through the provisional period (that is, those beginning in 1990, 1991, and so on through 1995), about 55 percent of new entrants have received tenure.

Tenure rates for females have been lower than for males (47 percent and 60 percent), and tenure rates for minority faculty have been lower than for non-minority faculty (52 percent and 56 percent).

Not shown in Table 1 are additional cross-tabulations by campus and college that are relevant within Penn State, but are probably not significant to most outside readers. Breakdowns of that sort show, for example, that tenure rates have been higher for University Park, Penn State's largest campus (58 percent), than for its other campus colleges (51 percent).

Table 1. Tracking Cohorts Entering the Tenure Track through Seven Years.
Penn State, University-Wide, including College of Medicine.

Cohort Year		All Entrants			Female			Male			Minority			Non-Minority		
	Entrants	Tenured	Rate	Entrants	Tenured	Rate	Entrants	Tenured	Rate	Entrants	Tenured	Rate	Entrants	Tenured	Rate
1990	121	70	58%	40	19	48%	81	51	63%	18	9	50%	103	61	59%
1991	93	55	59%	30	15	50%	63	40	63%	8	5	63%	85	50	59%
1992	151	89	59%	55	28	51%	96	61	64%	29	15	52%	122	74	61%
1993	103	55	53%	31	12	39%	72	43	60%	17	8	47%	86	47	55%
1994	134	63	47%	50	17	34%	84	46	55%	21	6	29%	113	57	50%
1995	127	70	55%	53	30	57%	74	40	54%	23	17	74%	104	53	51%
Totals	**729**	**402**	**55%**	**259**	**121**	**47%**	**470**	**281**	**60%**	**116**	**60**	**52%**	**613**	**342**	**56%**

This analysis covers tenure decisions through the seventh year. Therefore, tenure rates include individuals who "stopped the clock" for one year. Typically, there are 6 to 12 such individuals, university-wide, in any year's cohort.

Data include University Park, Behrend, Capital, and the College of Medicine. Individuals who changed tenure-granting unit during the provisional period are excluded. Locations other than those listed above are excluded. Data on library faculty of equivalent rank are included.

mike's docs/multi-f&m95.xls

Table 1 indicates only whether faculty members received tenure; it does not explain why things happened. Many individuals leave voluntarily, not necessarily because they were denied tenure. Penn State has explored this and related matters via a faculty exit survey and interview process which the university implemented in 1997. Those analyses are outside the scope of this paper, but a report is available online (Penn State, 2002).

Definitional Considerations

As will become clear later in this paper, when similar analyses from other universities are reviewed, there is no standard methodology for studies of this sort. Therefore, it is helpful to be explicit about basic definitions.

Each cohort in Table 1 includes new entrants into provisional status at Penn State. ABDs hired initially into a fixed-term position, probably not yet on the tenure track, are included in a tenure cohort for the year in which they formally entered provisional status. Table 1 tracks cohorts *through* the seventh year – that is, one year past the normal tenure-decision point. This accounts for individuals who temporarily "stopped the clock" for one year (for example, for medical reasons).

(An additional source of complexity that is probably irrelevant to any but the most curious readers is that Table 1 excludes some groups of faculty. This exclusion relates to extraordinary reorganizations within the university during the mid-1990s that allowed faculty members to move from one tenure-granting unit to another. That situation is, of course, not typical of most provisional faculty members' experience at Penn State or elsewhere.)

Comparative Information

As already noted, there is relatively little comparative cross-university information on the question, "What proportion of assistant professors entering the tenure-track actually achieve tenure?" Nonetheless, institutional researchers at several other research universities have studied this issue in recent years. Definitions and approaches do vary somewhat, but relevant and useful comparative data have been identified.

University of Missouri. An analysis of data for the University of Missouri system showed that 39 percent of 385 assistant professors hired in five cohorts in the 1980s in that system secured tenure within six years (Eimers, 1995). Note that Table 1 in this paper analyzes Penn State tenure rates through the *seventh* year, to account for individuals who stop the clock. The seventh year adds about seven percent to Penn State's tenure rate. If the Missouri figure were adjusted on that basis, Missouri's rate would rise to about 46 percent. While that figure of 46 percent is admittedly imprecise, it probably provides a fairly reasonable comparison to Penn State's tenure rate of 55 percent.

Logistic regression of the University of Missouri dataset found that gender did not help to predict whether an assistant professor would receive tenure. Also, ethnicity was generally not strongly related to tenure outcomes. There were some relatively weak, but statistically significant, negative relationships between being African-American or Hispanic and the likelihood of receiving tenure for some campuses and/or disciplines in the Missouri analysis.

University of Minnesota. Researchers examined the histories of tenure-track assistant professors hired between 1972 and 1985 by the University of Minnesota's Institute of Technology and College of Biological Sciences (Jones & Hoenack, 1992). Of 104 entrants, 74 individuals, or 71 percent, were promoted to associate professor. Because the Minnesota study used a multivariate model (logit analysis), the researchers were able to conclude that when controlling for other variables – such as number of publications, years of previous experience, and number of courses taught – women were more likely than men to be awarded tenure. That gender difference was small, but statistically significant.

Stanford University. In 1999, to address its hiring and promotion record in the context of equal opportunity considerations, Stanford University released data on tenure rates for assistant professors hired from 1987 through 1991. For those cohorts, at Stanford, 50 percent of men and 51 percent of women were awarded tenure (Robinson, 1999).

University of Wisconsin-Madison. A study examined data on 1,530 probationary faculty members hired between 1978 and 1997 at the University of Wisconsin-Madison. Of those, about 60 percent had received tenure. A smaller proportion of women than men received tenure – 53 percent of women faculty and 64 percent of men were promoted during the analysis period (Harrigan, 1997).

Miami of Ohio. The institutional research office at Miami University of Ohio has shared unpublished data on tenure rates of assistant professors hired in tenure-track positions from 1982 through 1995, compiled through Spring 2001 (Krallman, 2003). For that starting population of 506 new, tenure-track assistant professors, the overall tenure rate was 64 percent. The tenure rate was lower for females (58 percent) than males (69 percent); a higher percentage of females (32 percent) than males (21 percent) left Miami before the decision.

Interpretation

Definitions and methodologies vary among the peer institution studies that have been found. It is likely that results and conclusions would vary, perhaps considerably, had different parameters been decided upon for any particular analyses. Absent clearly articulated data-sharing conventions, caution is probably advisable, to avoid reaching conclusions that may not be supported by evidence. Nonetheless, four concluding observations are offered.

First, this paper suggested earlier that an apparently plausible indicator of the stringency or laxity of the tenure process – the percentage of tenure awards or denials at the decision point – is ambiguous and perhaps misleading. As at Penn State, where over 90 percent of decisions lead to tenure awards, Miami's data reinforce that observation. On average, only nine percent of the entering cohort in the Miami analysis actually experienced tenure denials, but over one-quarter of the entering cohort had left before reaching the decision point.

Second, based on the evidence from several universities reviewed here (and subject to definitional differences), the probability of a new assistant professor eventually earning tenure appears to in the range of about 40 percent to about 70 percent. The picture is mixed on the effects of gender; in some cases, women are tenured at higher rates, and in others at lower rates. With two exceptions (Penn State and the University of Missouri), the reports reviewed in this paper did not relate differences in tenure rates to minority/non-minority status.

Third, the literature – with good reason – does not answer the question: What is the "right" tenure rate? Higher and lower rates involve important tradeoffs. For example, does a high tenure rate indicate a lack of rigor in the promotion and tenure process? Or does a high rate reflect faculty excellence, and effective processes for recruitment, mentoring, evaluation, and retention? Does a lower tenure rate mean that a university has commendably high standards for tenure? Or does a low rate suggest that an institution is investing energy and money inefficiently, given the cost of hiring and developing new faculty members? As noted in one report on this question, "there are not common standards shared by peer institutions" (Eimers, 1995, p.12).

Fourth, it is always appropriate for institutional researchers to ask themselves, "Why do these data matter?" and "How is this analysis useful?" Within a college or university, accurate evidence on tenure rates is relevant and desirable since it provides all interested constituencies with a realistic overall sense of how stringent the tenure process is. Pragmatically, such institutional self-knowledge also can potentially highlight strengths and weaknesses of the university's processes for faculty hiring, evaluation, support, mentoring, and so on. Several of the universities cited here have active efforts under way to continuously improve their policies and programs in those areas, and data such as these are helpful in identifying opportunities for improvement. In short, as this sort of evidence is shared across a university community, it can become part of an informed dialogue about ways to enhance the career development of an institution's faculty.

References

Chait, R. (1997, February 7). Why academe needs more employment options. *Chronicle of Higher Education*, p. B4.

Eimers, M. (1995, May). *Exploring faculty career progression: A retention and tenure perspective.* Paper presented at the Annual Forum of the Association for Institutional Research, Boston, MA.

Harrigan, M. (1997, October). *An analysis of faculty turnover at UW-Madison.* Paper presented at the Association of Institutional Researchers of the Upper Midwest's Annual Meeting, Minneapolis, MN.

Jones, L.K.& Hoenack, S.A. (1992, October). *A model of the career development of tenure track assistant professors*. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Minneapolis, MN.

Krallman, D. (2003, April). Tenure rate by gender, 1982-1995, Miami University – all campuses. Office of University Budget and Institutional Research, Miami University, Miami, Ohio. Personal communication to Michael J. Dooris.

Lee, J. (2001, June). Tenure. *National Education Association Research Center Update*, *7*(3), pp.1-8.

Penn State (2003, January). *University-wide indicators and financial information*. University Budget Office: University Park, PA

Penn State (2002, September). *Faculty exit survey, 1997-2002*. Retrieved April 14, 2003 from Office of Planning and Institutional Assessment: University Park, PA. Web site: http://www.psu.edu/president/pia/planning_research/reports/index.htm

Robinson, J. (1999, February 10). *Casper discusses hiring, promotion*. Retrieved April 14, 2003 from Stanford Online Report.Web site: http://news-service.standford.edu/news

THE IMPACT OF A VIRTUAL UNIVERSITY ON THE WORKPLACE COMPETENCIES OF ITS GRADUATES: A LONGITUDINAL INVESTIGATION UTILIZING MULTIPLE SOURCES OF INFORMATION

Tae Young Han
Nathan A. Schneeberger
Excelsior College

Abstract

First, this study explores the relationship between student attitudes toward their undergraduate experience at a virtual university six months after graduation and their perceptions of their own work-related college learning outcomes 2.5 years later. Second, this study examines the relationship between student perceptions of work-related outcomes and the perceptions of their supervisors. Individual characteristics and graduates' academic experiences are used to predict supervisor ratings of competencies.

Recently a number of institutional researchers in academic settings have been focusing greater attention on the quality of the "end product" of a college education, that is, the skills and abilities of students upon completion of their degrees (Muffo, 2001). Examining the competencies of graduates may add a new dimension to institutional research by considering students' long-term success in addition to previously studied student outcomes, such as academic achievement and success upon graduation (Arnold & Davey, 1994; Rainsbury, Hodges, & Burchell, 2002; Spencer & Spencer, 1993).

From an employer's perspective, the quality of an institution may depend primarily on the competencies that graduates possess upon their entry into the workforce. For employers, a good college education is one that will equip potential employees with the skills and abilities necessary to fulfill their future work roles (Warn & Tranter, 2001). This may be an important indicator of quality for non-traditional, virtual universities because of the differences between traditional and non-traditional students.

As many researchers have noted, non-traditional students are qualitatively different than traditional college students (e.g., Bean & Metzner, 1985). Non-traditional students tend to be older than their traditional counterparts, and they must often balance the demands of family, a full-time job, and school. Many non-traditional students return to school to further develop workplace skills whereas traditional students may be more focused on personal growth, social opportunities, and extra-curricular activities. Therefore, evaluating non-traditional students may require greater emphasis on the measurement of workplace competencies.

Workplace competencies can be measured by asking graduates the extent to which they have acquired knowledge, skills, and abilities in school, and the extent to which they apply them in their work life (Arnold & Kiosoglous, 2003). The American Association for Higher Education (AAHE) Principles of Good Practice for Assessing Student Learning (1992) go a step further and suggest that "assessment is most effective when it reflects an understanding of learning that is multidimensional, integrated, and revealed in performance over time." The AAHE recommends the assessment of higher education quality be comprehensive in such a way as to accurately capture the multidimensionality of institutional outcomes. A comprehensive assessment requires a solid framework such as Kirkpatrick's model of training evaluation to evaluate an institution's impact on students' work competencies.

Kirkpatrick's model (1969, 1998) has been the basis for much of the previous research on learning outcomes in organizations. This model evaluates the success of any training or educational program on four distinct levels; "reactions", "learning", "behavior", and "results". Reactions are an individual's level of satisfaction with and enjoyment of the training experience. Learning is the cognitive knowledge gained from the training program. Behavior refers to actual changes in work skills or abilities that occur as a result of the training, and results are benefits the organization receives (i.e., increased productivity, increased profit) for training employees. Kirkpatrick's model of training evaluation is one of the most used evaluation framework in corporate training programs.

Applying Kirkpatrick's model to a college or university requires that student learning and competency development be assessed not just during or upon exit from the university, but also sometime later. Students need time to determine which of the skills they have developed are important within their careers before they can truly assess the value of their education. Measuring competencies after graduation may be a better way to measure behavioral level outcomes because this type of study may examine the application of learning beyond the classroom. However, researchers must overcome a number of practical barriers to study student competencies after graduation. Survey research in general is limited by response errors and biases such as self-enhancement and leniency (Gilbert, & Malone, 1995; Greenwald, 1988; Paulhus, 1991). Self-enhancement is the tendency to attribute success to internal factors such as ability and effort, and failure to external factors such as luck or task difficulty. According to research on surveys, individuals are likely to rate themselves and entities closely related to their identity more positively than they actually are in situations that require evaluation.

Despite their limitations, surveys are one of the few ways that colleges have to contact graduates after they leave the institution. Thus, in order to improve the quality of outcomes assessment, it may be useful to search for ways to minimize response biases. One possible solution would be to collect information from multiple sources.

Collecting information from multiple sources may be more accurate and reliable than a single-sourced approach.

However, collecting information from multiple sources is not a perfect solution because different people have different perspectives. In the case of job performance, research on 360 degree assessment has found only a weak relationship between self-ratings of job performance and supervisors' ratings of job performance (Atkins & Wood, 2002). The relationship is weaker for self-supervisor ratings than other ratings (e.g., peer-self, subordinate-self), with average correlation coefficients ranging from .14 to .35 (Conway & Huffcutt, 1997; Harris & Schaubroeck, 1988; Mount, 1984).

The present study will consider several possible explanations for the inconsistency between ratings from multiple sources. First, specificity of the construct being measured may also influence the inconsistency in ratings. When the competencies being rated have more than one behavioral indicator, each source (i.e., employee or supervisors) may focus on the behavior (or result of behavior) that is easiest for them to observe. For example, when rating "communication skill" supervisors may focus on communication with supervisors while employees are focusing on communication with clients that is not routinely observed by the supervisor. (Conway & Huffcutt, 1997; London & Smither, 1995). Therefore, a broad, general measure that covers multiple behavioral dimensions may lead to greater variability among the ratings because of the greater opportunity to focus on different aspects of the same behavior, or the same aspect of different behavior (Facteau & Graig, 2001). This may be a problem in competency measures because competency taxonomies often consider both underlying traits and superficial skills (Spencer & Spencer, 1993). Second, correlation between self and supervisor surveys may be lower than expected because of a self-enhancing bias manifesting itself through the self-report survey (Harris & Schaubroeck, 1988).

Present study

This study has two main purposes. First, this study will examine the relationship between academic achievement variables (i.e., learning level outcomes) and a set of attitudinal variables measured six months after graduation with work competencies (i.e. behavioral level outcomes) measured three years after graduation. These findings will shed light on the impact that institutions have on the workplace competencies of their graduates. Second, this study will examine the hypothesis that agreement between different sources of ratings depends on the specificity of the construct being measured. Work-related competencies will be evaluated by graduates and their immediate supervisors at three different levels of specificity. Supervisors and graduates will use measures of critical thinking (i.e., an abstract construct not specifically job related), workplace competencies (i.e., a measure of occupation-specific competencies related to job success), and job specific-communication skills (i.e., a measure of a specific job related skill that is a part of the more general set of workplace competencies) to evaluate the competencies of graduates. These measures are described in greater detail below.

Critical thinking. Critical thinking is defined as the intellectually disciplined process of conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from observation, experience, reflection, reasoning, or communication (Halpern, 1996). It is an aggregation of higher-order thinking skills that have been associated with an individual's ability to apply solutions from previously solved problems in new learning situations and on novel tasks. Critical thinking has been examined in a variety of research areas, including traditional academia (Barth, 2003), organizational functioning (Hwang, 2002), knowledge management (Gold, 2002; Varney & McFillen, 2000), and health care *(*Griffitts, 2002; Ignatavicius, 2001).

An implicit goal of higher education is to instill a broad range of thinking skills and abilities in students who complete degree requirements. For this reason, numerous research studies have examined the link between critical thinking and important college outcomes across a range of academic programs (e.g., Cheung, Rudowicz, Kwan, & Yue, 2002; Gadzella & Masten, 1998). These critical thinking competencies are also important in workplace settings, because employees at all levels (e.g., CEO, manager, administrator, line worker) need some degree of higher level thinking to be able to function well and adapt to change (Gold, 2002; Varney & McFillen, 2000). Therefore, critical thinking skills are seen as attributes that can help smooth the transition from academic studies to professional practice.

Work competencies. There is no commonly accepted definition of work competencies that provides a "one-size-fits-all" solution across jobs, but there has been support to develop smaller "sets" of competencies that fit specific jobs (Mansfield, 1996; McLagan, 1996; Mirabile, 1997). Such core competencies can be developed for a job through a process called "competency modeling," which describes a job's basic requirements while incorporating the organization's goals. Competency modeling evolved from job analysis, a technique for job description that describes job requirements in terms of the knowledge, skills, abilities, and other characteristics (i.e., personality) required to perform the job well. Spencer and Spencer (1993) suggest in their Iceberg model of competencies that there are five competency domains; motives, traits, self-concept characteristics, knowledge, and skills. According to their model, 'traits' are the most difficult to change or develop, and 'knowledge and skills' are the most malleable. Researchers have proposed competency models that include other psychological constructs such as attitudes, self-esteem, and even such broad social constructs as cultural and/or organizational awareness (e.g. Dalton, 1997; McLagan, 1997; Mirabile, 1997). Recently, professionals in the field of health care developed a set of core competencies for public health workers in the United States through an extensive review of the health care literature (Council on Linkages Between Academia and Public Health Practice, 2001). The nursing competency measure used in this study is similar in perspective to the set of core competencies developed for public health workers.

Job Specific Communication skills. In general, communication involves transmitting ideas and information in a way that is appropriate to the topic, the purpose, and the target audience. It also involves sharing and discussing ideas with others, hearing and responding to questions, and responding appropriately to criticism (Hunt, 1989). Although "communication skill" may be a common job related competency, specific communication behaviors may vary greatly from job to job. Therefore, communication may also be conceptualized as a very specific set of skills required to complete certain job specific tasks and solve certain job specific problems that is imbedded within the larger framework of work competencies. In occupations that have a unique vocabulary and require continual interaction with a variety of constituents (e.g., health care), job specific communication may be a critical component of work performance. The presence of job related communication skills can also prevent negative side-effect, such as burn-out, depression, and anxiety (Shimizu, Mizoue, Kubota, Mishima, & Nagata, 2003).

Predictors of workplace competencies. This study examines the ability of a number of variables derived from previous research to predict students' competency development (e.g., Terenzini, 1989). A wide range of variables may influence a college's ability to improve the workplace competencies of its graduates. Students' characteristics, students' perceptions of educational quality, and quality of educational services may influence the development of competencies. This study included measures of the above as well as measures of customer satisfaction and service quality as reaction-level outcomes of higher education (Benjamin & Robinson, 1998; Clarke, 2001; Parasuraman, Zeithaml, & Berry, 1994). These reaction level measures will be used to predict other educational outcomes (i.e., learning and behavior in Kirkpatrick's model).

Learning outcomes are generally measured with summative assessments that examine actual knowledge or skill gain. Grade point average (GPA) is a measure of student learning that has been used by researchers as an outcome measure of student learning. For example, research has shown that students with a clear career orientation achieved higher GPAs than those who were uncertain about their professional future (Himelstein, 1992; McKenzie & Schweitzer, 2001). Students may also rate their abilities and skills and the extent to which they developed these skills as a result of their college experience. Individuals' beliefs about their own abilities (i.e., self-efficacy) have been shown to be strongly related to their actual ability (Bandura, 1986). Knowledge and learning related self-efficacy are also good predictors of academic performance. They have shown strong positive relationships with actual academic success, and individuals who have higher expectations of academic success tend to have higher graduation rates than those with low self-beliefs (Cassidy & Eachus, 2000; Lent, Brown & Larkin, 1984).

Method

Participants

Three years after graduation, 713 School of Nursing alumni from a virtual college responded to a post-graduation survey. Of these former students, 595 had previously responded to a survey sent six months after graduation (leaving 118 who only responded to the 3 year survey). The three year survey asked respondents to provide mailing information for their immediate work supervisors, and 240 individuals provided supervisor addresses. Of the 240 surveys sent to supervisors, 128 (53.3%) were returned. The analyses for the relationships between supervisor's evaluation and graduate's rating were based on this smaller sample. Of the 713 students who responded to the three year survey, 83.9% were employed full time, and 14.1 % were employee part time. Of these participants, 86.4 % were female; 83.1 % were non-minority (6.9 % were African American, and the remaining were of another ethnicity); the average age was 41 years ranging from 23.7 to 64.7 years (median age was 41); and the average years of work experience prior to their enrollment in the college was 11.6 years (ranging from one to forty years).

Procedure

The procedure used to collect the data was the same for both the six month and three year surveys. An initial letter inviting graduates from the school of nursing (Associate and Bachelor's degree programs) was sent out to recruit participants for an upcoming survey. A survey was sent one week later, and two additional surveys were sent to those individuals who did not respond to the initial survey in a timely fashion. The second survey was sent out three years after graduation and asked questions about personal and career changes experienced after graduation. As mentioned above, the three year survey also asked participants to provide the name and mailing address of their immediate supervisor. Finally, demographic information and academic records were extracted from the College's student database and matched with survey responses.

These surveys are a part of the college's outcome assessment program that uses multiple methods and measurements to assess student learning. The surveys were designed to assess the current occupational status of the graduate and measure educational outcomes some time after graduation. The six month post-graduate survey focuses on student satisfaction, work preparation, and work/career goal achievement. The three year post-graduation survey includes measures of; professional development, job satisfaction, efficacy as lifelong learners, workplace competencies, and the impact of the college experience on the facets mentioned above. The supervisor survey provides a second perspective on the graduates' workplace competencies.

Measures

Reaction to the college experience. Three scales were used to measure different reactions to the college experience. First, an 11-item Likert-type scale (1=*Strongly*

Disagree, 7 = *Strongly Agree*) was included in the 6 month survey to measure the quality of services provided by the college to its students (sample item = "The College performed the service right the first time"; Coefficient alpha = .94).

Second, graduates in the six month survey were asked to rate the extent to which the college prepared them for a number of workplace tasks such as; writing skills, leadership skills, computer knowledge, and critical thinking. Eleven such items were rated on a 7-point Likert-type scale (1=*Very Poorly*, 7 = *Very Well*). Coefficient alpha for the scale was .94.

A third way to assess reactions to the college experience is to ask students how likely they would be to enroll in the college a second time. Graduates on the three year survey were asked how likely they would be to attend Excelsior College if they "had to do it all over again." This item was rated on a 7-point Likert-type scale (1=*Definitely No*, 7 = *Definitely Yes*). This rating is subsequently referred to as "re-matriculation intention".

Knowledge-Related Efficacy. Knowledge related efficacy was measured on the three year survey by asking graduates the extent to which they had achieved a number of knowledge and information processing skills and abilities. This 12 item scale contained items such as "Ability to read materials from your field analytically and critically". These items were rated on a 7-point Likert type scale (1=*Not at all,* 7 = *Completely)*. Coefficient alpha was .95.

College Helped Personal Growth. This measure assessed the extent to which graduates believed that their college experience helped them grow as a person. Graduates rated 14 statements on a 7-point Likert-type scale (1= *Very Poorly,* 7 = *Very Well*) such as "Adapting to different social situations". Alpha for this scale was .95.

Critical thinking. The 12-item critical thinking measure was developed through collaboration of faculty and research staff at the college following a review of the literature on the goals of general education. This measure was used on both the three year and supervisor surveys to assess critical thinking (Sample item = "analyze and synthesize complex patterns of data to develop judgments") on a 7-point Likert-type scale (1=*Much Worse*, 7 = *Much Better*). Alpha coefficient of the scale was .93 for the graduate sample and .98 for the supervisor sample.

Work-related Competencies. Work competencies were measured by having graduates and supervisors rate the extent to which graduates had achieved each of 21 competencies specific to nursing. These behavioral competencies included items such as: "I adapt care in situations that may be atypical or complex". These items were rated on a 7-point Likert-type scale (1 = *Not at All*, 7 = *Completely*). Coefficient alpha for this scale was .92 in the graduate sample and .98 in the supervisor scale.

Job Specific Communication. Job specific communication was conceptualized as a specific work-competency directly related to nursing performance. This 13 item

scale used the same rating scale as above, but asked items more closely tied to specific skills and behaviors (e.g., "I use therapeutic communication to convey caring"). The coefficient alpha for graduates was .94 and the coefficient alpha was .98 for supervisors.

Results

Descriptive statistics and correlations among the major variables in the study are provided in Table 1. The impact of reactions on learning were tested using the three reaction dimensions (work preparation, service quality, and re-matriculation intention) and two learning level outcomes (College help personal growth and knowledge related efficacy). First, the learning criteria were separately regressed on the reaction measures. As shown in Table 2, results show that work preparation has a strong relationship with both outcome variables ($\beta = .32$, $p < .01$ for college help for personal growth; $\beta = .18$, $p < .01$ for knowledge related efficacy). Re-matriculation intention has a moderately strong relationship with college help for personal growth ($\beta = .22$, $p < .01$). The overall R2 for college help for personal growth was .23 ($p < .01$) and the R2 for knowledge-related efficacy was .05 ($p < .01$). Final GPA was not significantly related to any of these reaction variables (See Table 2).

The relationships between learning outcomes and behavioral outcomes were examined using the data from two different sources; graduates and direct supervisors. As expected, the graduates' generally rated themselves higher than did supervisors. However, the relationships between supervisor and self-ratings were smaller than expected (see Table 3). It is likely that this correlation is suppressed by some sort of systematic rating bias. To control for this rating bias, difference scores were calculated for each assessment by subtracting self-rating from supervisor ratings. These difference scores ranged from large negative value (i.e., self rating is much higher) to moderately positive value (i.e., supervisor rating is higher). For each of the three behavior outcomes, an index of bias was created by taking the average difference score from the other two behavior measures. The logic behind these difference indexes is that differences in ratings between supervisor and self ratings may be systematic and present across all three competency measures. Therefore, the average difference between supervisor and self ratings may capture some of this systematic variance due to bias. By including the average rating difference across two of the dimensions in a hierarchical linear regression it may be possible to control for the linear effect of the rating bias without creating a singularity in one of the predictors.

The results of the hierarchical regression analyses are summarized in Table 4. Demographic variables (age and gender) were entered in the first step, the index of bias in step two, and three year self-perception variables were entered into step three. Measures of intrinsic and extrinsic job importance were included to control for differences in the extent to which having a job is important to different people. As predicted, learning level outcomes were related to behavioral outcomes (as measured by supervisors). Job specific communication had the strongest relationship with the set of predictors and critical thinking had the weakest relationship.

Table 1

Descriptive Statistics, Reliability, & Inter-correlation

Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11
1. Work preparation	6.20	1.44	(-)										
2. Service quality	4.87	1.18	.29**	(.94)									
3. Repurchase Intention	5.80	1.05	.33**	.53**	(.94)								
4. Intrinsic Importance of Job[a]	6.19	.76	.14**	.22**	.26**	(.86)							
5. Extrinsic Importance of Job[a]	6.20	.92	.06	.21**	.22**	.45**	(.80)						
6. Knowledge efficacy[b]	5.69	.92	.13**	.22**	.16**	.36**	.17**	(.95)					
7. College help for growth[c]	5.12	1.55	.33**	.42**	.30**	.27**	.15**	.23**	(.95)				
8. Final GPA	3.21	.44	.02	-.02	.02	-.03	-.08	.04	-.02	(-)			
9. Communication by Sup[d]	5.71	1.07	.12	-.06	-.06	.23*	-.02	.10	.13	.19*	(.98)		
10. Work competency by Sup[d]	5.64	1.02	.07	-.03	-.01	.29**	.02	.07	.08	.17	.89**	(.98)	
11. Critical thinking by Sup[d]	5.09	.97	.04	-.10	-.12	.23*	.03	-.01	.03	.06	.63**	.69**	(.97)

Note. + $p < .1$, * $p < .05$, ** $p < .01$, [a]Rating of the importance of intrinsic and extrinsic aspects to their current job 3 yrs after graduation. [b]Student self-rating of ability on given competency 3 yrs after graduation. [c]Student rating of the extent to which their undergraduate degree helped them achieve the personal growth 3 year after graduation. [d]Supervisor ratings of specific work competencies 3 yrs after graduation.

Table 2

Regression analysis of reaction variables on 3 year outcomes

Predictors	Outcomes (β)		
	College help for Personal Growth	Self-efficacy Gen know	GPA
Work preparation	.32**	.18**	.04
Service quality	.06	.04	.03
Repurchase Intention	.22**	.06	.02
R^2 of model	.23**	.05 **	.00

Note. * p < .05, ** p < .01

Table 3

Comparison between self-rating and supervisor-rating regarding competencies

Competencies	Mean		Range		Gap[a]		Correlation
	Super	Self	Super	Self	Mean	Range	
Communication skills	5.71	6.11	2.75	1.00	-.44	-4.24 ~ 1.77	.13
Work competencies	5.64	5.82	3.05	1.00	-.55	-3.48 ~ 1.90	.15 +
Critical thinking	5.09	5.40	2.14	2.00	-.37	-4.86 ~ 2.21	-.02

Note. + p < .1, * p < .05, [a]Rating gap variable for self-enhancement bias by calculating supervisor rating minus self-rating.

Table 4
Hierarchical regression analysis using supervisor's competency ratings as outcomes

Model	Predictors	Standardized Coefficients (β) of Outcomes		
		Communi-cation[e]	Work Competency[e]	Critical Thinking[e]
1	Age	.12	.10	.04
	Gender	-.29**	-.25**	-.20*
2	Age	.08	.08	.03
	Gender	-.15*	-.07	-.08
	Rating gap[a]	.63**	.65**	.58**
3	Age	.05	.06	.02
	Gender	-.12*	-.02	-.08
	Rating gap[a]	.85**	.92**	.59**
	Final GPA	.15*	.09	.03
	College help - personal growth[b]	.15*	.08	.01
	Knowledge efficacy[c]	.17*	.09	-.01
	Intrinsic Importance of Job[d]	.15*	.29**	.26**
	Extrinsic Importance of Job[d]	-.03	-.04	.01
Effect Size	R^2 of model 1	.10**	.08**	.04*
	R^2 of model 2 (ΔR^2)	.47** (.38**)	.47** (.40**)	.37** (.32**)
	R^2 of model 3 (ΔR^2)	.61** (.13**)	.59** (.12**)	.43** (.07+)

Note. + $p < .1$, * $p < .05$, ** $p < .01$, Gender: male coded as 1 and female coded as 0.
[a]Rating gap variable controlling for self-enhancement bias by calculating supervisor rating minus self-rating. [b]Student rating of the extent to which their undergraduate degree helped them achieve the personal growth 3 year after graduation. [c]Student self-rating of ability on given competency 3 yrs after graduation. [d]Rating of the importance of intrinsic and extrinsic aspects to their current job 3 yrs after graduation. [e]Supervisor ratings of specific work competencies 3 yrs after graduation.

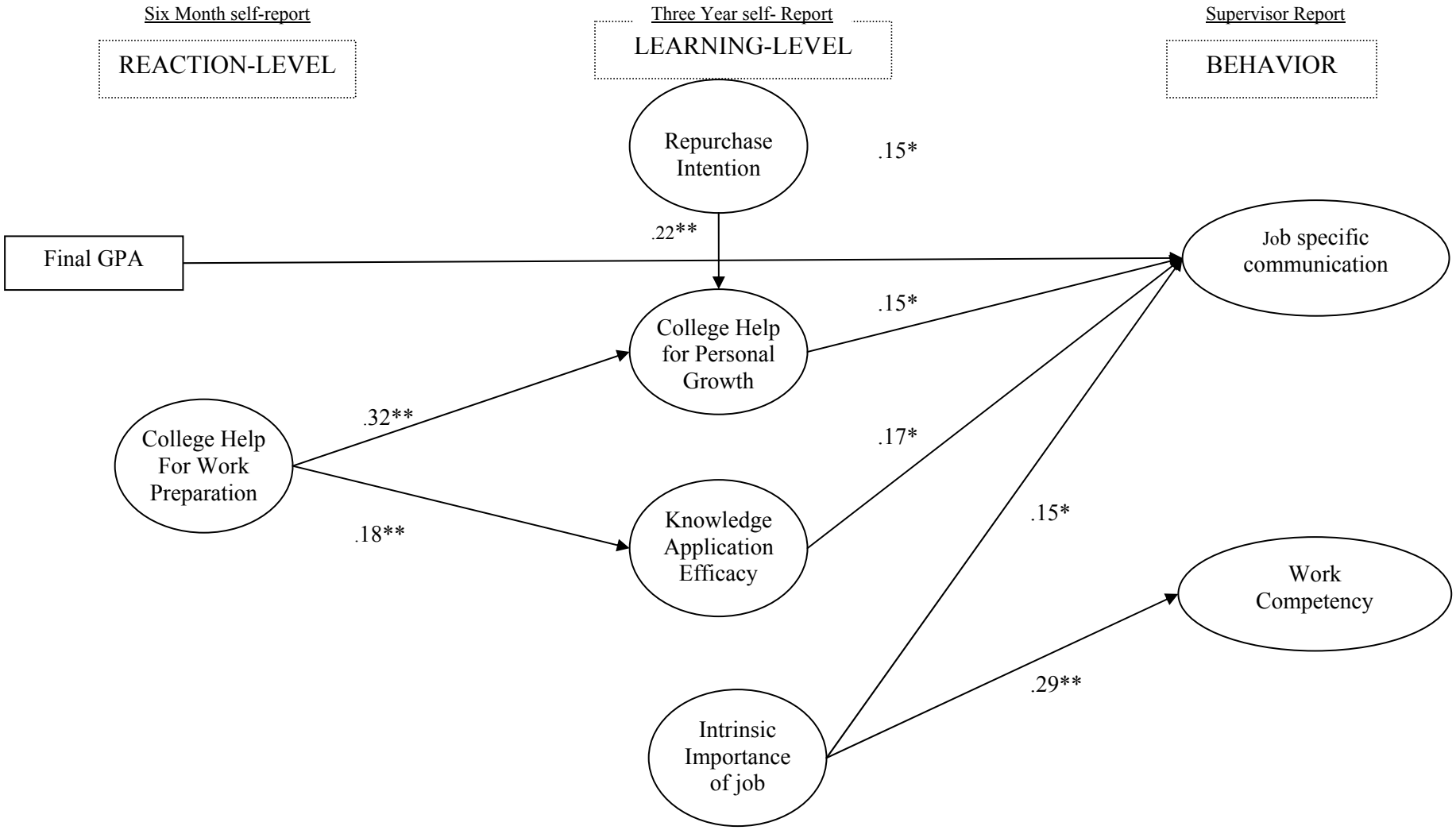


Figure 1. Pseudo-path model showing unstandardized regression coefficients
** p< .01, * p < .05

The strongest individual predictors of communication skill were final GPA, ($\beta = .15$, $p < .05$) college help for personal growth, ($\beta = .15$, $p < .05$) and knowledge related efficacy ($\beta = .17$, $p < .05$). However, none of these predictors showed significant relationships with work competency or critical thinking. Job-specific communication and work competencies showed stronger relationships with the set of predictor variables than did critical thinking (R2 for communication skills = .13, $p < .01$; R2 for work competencies = .12, $p < .01$, R2 for critical thinking = .07, $p < .05$). This supports the notion that it may be easier to account for variance in specific competency measures than more general competency measures.

Figure 1 presents a pseudo-path model in which the significant regression weights associated with each of the analyses (reaction predicting learning, learning predicting behavior) are shown together.

Discussion

Although student success may be defined in a number of ways, from an employer's point of view the most important criterion for student success may be the extent to which graduates are equipped with the competencies that are required to be successful in the workplace. This may be especially true for non-traditional students who are more focused on career success than their traditional counterparts. In this study, Kirkpatrick's model of training evaluation was used as a framework to examined the extent to which student satisfaction with and learning from the college can be used to predict workplace competencies three years after graduation.

The findings in this study showed strong relationships between students' attitudes toward college experience and self ratings of learning measured three years later. The extent to which the college helped to prepare students for the workplace was positively related to subsequent learning related efficacy. Also, the more students believed that the college helped to prepare them for the work place, the more positive was their belief that they had grown as a person. Also, students' re-matriculation intentions were positively related to their beliefs regarding how much the college helped them grow as a person. Service quality was not a significant predictor of subsequent attitudes, beliefs, or competencies. It would be tenuous to conclude that service quality is unrelated to educational outcomes because the sample is restricted to only those students who actually graduated. Extremely dissatisfied students may have already left the college well before graduation. On the whole, these findings support the idea that the quality of one's educational experience can have a positive impact on self-efficacy and attitudes toward the college well after graduation.

Competency ratings were collected from graduates and their immediate supervisors to examine the relationship between efficacy beliefs and "college impact" variables on work competency measures. The argument was made that the relationship between self and external competency ratings should increase as the criterion measures become more specific. The results of this study provide some support for this

prediction. Job-specific communication, the most specific competency, was most influenced by learning-related variables (i.e., students' final GPA, college's help for personal growth, and knowledge related self-efficacy) and had the highest absolute correlation between self-and supervisor ratings. These learning-related variables were also related to communication skills, whereas none of them were significantly related to critical thinking competency (i.e., the least specific competency). A comparison of effect sizes also supports this conclusion. The regression equation for communication skills had the largest R^2, the equation for critical thinking had the smallest R^2, and the R^2 for work competencies fell in between. These results imply that researchers need to exercise caution when assessing student outcomes because the strength of the relationship may vary depending on the specificity of outcome measures. One recommendation for future research would be to examine these relationships using more comprehensive statistical techniques such as structural equation modeling.

The relationships between learning level outcomes and behavioral outcomes (e.g., specific work competencies and critical thinking) were weaker than expected. There are a number of possible explanations for these weak relationships. First, this study examined learning criterion as measured by self-perceptions of ability instead of measuring actual abilities (i.e., administration of a knowledge test), therefore, the strength of the relationship between perception and behavior is confounded by the accuracy of the individuals' perceptions. This study tried to control for self-enhancing bias by generating an index of bias to use as a covariate in regression analyses, but this may have had limited usefulness because there is some preliminary evidence that rating bias may be non-linear. A second problem that may occur in any longitudinal study is the possibility that attrition was systematically related to one of the variables of interest. The number of individuals who respond to longitudinal surveys generally decreases over time, as was the case in this survey. Furthermore, participants also had to volunteer the name and address of their supervisor. Although more than 50% of supervisors who were sent surveys responded; only 18% of three year survey respondents also had a rating from their supervisor. Even though t-tests looking for differences between those who provided supervisor information and those who did not showed no significant differences, there still may be systematic biases on some variables that were not measured for the whole population (e.g., those who perceive themselves to have low work competencies may not have provided supervisor information). Lastly, according to Kirkpatrick's review of the hierarchical model, learning is more likely to influence organizational effectiveness directly. Although the relationships may be larger between learning and organizational effectiveness, the latter construct is well beyond the bounds of traditional institutional research. More research is needed in the future to determine the specific ways in which colleges impact organizations.

This study is not without limitations. First, although Figure 1 presents a comprehensive path model based on Kirkpatrick's model, the analyses were run with separate ordinary least squared regression as opposed to testing the fit of a global model. In this case, the sample size (number of supervisor ratings) was too small to run

global analyses such as structural equation models (Bollen, 1989). Thus, the path coefficients in this model are vulnerable to increased Type-I error. Future research would benefit from testing a global model using all the variables in a structural equation model. Another weakness of this study is the presence of common method variance between the 6 month and 3 year surveys. Despite the length of time between administrations, it is possible that respondents committed similar response errors on both surveys. Third, this study focused on students from a non-traditional college making the extent to which these findings can be generalized to students at traditional institutions unknown. A revised model that better matches the objectives of traditional colleges may be more useful.

Another issue of concern is the low correlation between supervisor and graduate ratings of work competencies. Although this study used the difference between these ratings as a proxy control for rating biases, the impact of response biases may be more complicated. The difference between supervisor's rating and self-rating (i.e., supervisor rating minus self-rating) was normally distributed with approximately one third of graduates rating themselves *lower* than their supervisor rated them. This finding, along with previous research on the topic (Atwater, Ostroff, Yammarino, & Fleenor, 1998) suggests there may be other psychological constructs that are associated with response biases on competency ratings.

Even though the relationships between self and supervisor ratings were weak, we believe the results show the value of comprehensive research efforts that use multiple sources of information. Each source may highlight unique aspects of institutional quality, and integrating different sources of information may increase the overall validity of assessment efforts.

References

American Association for Higher Education. (1992). *Principles of good practice for assessing student learning*. Washington, D.C.

Arnold, J., & Davey, K.M. (1994). Evaluating graduate development: Key findings from the graduate development project. *Leadership and Development Journal, 15,* 9-15.

Atkins, P. W. B., & Woods, R. (2002). Self-versus others' ratings as predictors of assessment center ratings: Validation evidence for 360-degree feedback programs. *Personnel Psychology, 54*(4), 871-904.

Atwater, L. E. Ostroff, C., Yammarino, F. J., & Fleenor, J. W. (1998). Self-other agreement: does it really matter? *Personnel Psychology, 51,* 577-595.

Arnold, K., & Kiosoglous, C. (2003). *Technology and assessing workplace competencies*. Paper presented in American Association for Higher Education Assessment Conference. Seattle, Washington.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs: N.J., Prentice-Hall.

Barth, S. (2003). Leading organization change emphasizes six learning methods: reading, critical thinking, teamwork, design, practice and critique/assessment. *KM World, 12,* 20.

Bean, J., & Metzner, B. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55,* 485–650.

Benjamin, M., & Robinson, J. (1998). Service quality, encounter satisfaction, and the delivery of student health services. *Journal of College Student Development, 39,* 427-437.

Cassidy, S., & Eachus, E. (2000). Learning style, academic belief systems, self-report student proficiency and academic achievement in higher education. *Educational Psychology, 20,* 307-322.

Cheung, C. K., Rudowicz, E., Kwan, A. S. F., & Yue, X. D. (2002). Assessing university students' general and specific critical thinking. *College Student Journal,36*(4),504.

Clarke, G. (2001). Confirming satisfaction as an attitude within the service-buying process. *Journal of Consumer Behaviour, 1*, 111-123.

Conway, J. M., & Huffcutt, L. I. (1997). Psychometric properties of multisource performance ratings: A meta-analysis of subordinate, supervisor, peer, and self-ratings. *Human Performance, 10,* 331-360.

Council on Linkages Between Academia and Public Health Practice. (2001). *Core competencies for public health professionals*. Washington, DC: National Association of County and City Health Officials.

Dalton, D. R. (1997). Employee transfer and employee turnover: A theoretical and practical disconnect? *Journal of Organizational Behavior, 18,* 411-413.

Facteau, J. D., & Graig, S. B. (2001). Are performance appraisal ratings from different rating sources comparable? *Journal of Applied Psychology, 86,* 215-227.

Gadzella, B. M., & Masten, W. G. (1998). Critical thinking and learning processes for students in two major fields. *Journal of Instructional Psychology, 25,* 256-261.

Gilbert, D. T., & Malone, P. S. (1995). The correspondence bias. *Psychological Bulletin, 117*, 21-38.

Gold, J. (2002). The role of argument analysis and story telling in facilitating critical thinking. *Management Learning, 33,* 371-389.

Greenwald, A. G. (1988). Self-knowledge and self-deception. In J. S. Lockard & D. L. Paulhus (Eds.), *Self-deception: An adaptive mechanism?* (pp. 113-131). Englewood Cliffs, NJ: Prentice Hall.

Griffitts, L. D. (2002). Nurse leaders most frequently suggest critical thinking and clinical decision making as essential professional skills. *Nursing Management, 33,* 22-25.

Halpern, D. F. (1996). *Thought and knowledge: An introduction to critical thinking* (3rd Ed.) Mahwah, NJ: Lawrence Erlbaum Associates.

Harris, M. M., & Schaubroeck, J. (1988). A meta-analysis of self-supervisor, self-peer, and peer-supervisor ratings. *Personnel Psychology, 41,* 43-62.

Himelstein, H. C. (1992). Early identification of high-risk students: Using non-cognitive indicators. *Journal of College Student Development, 33*, 89–90.

Hunt, G. T. (1989). *Communication skills in the organization* (2nd Ed.). Englewood Cliffs, N.J.:Prentice Hall.

Hwang. A. L. (2002). Comparative analysis of accounting treatments for derivatives, *Journal of Accounting Education, 20,* 205-215.

Ignatavicius, D. D. (2001). 6 critical thinking skills for at-the-bedside success. *Nursing Management, 32*, 37-39.

Kirkpatrick, D. (1998). *Evaluating training programs: The four levels*. San Francisco: Berrett-Koehler

Lent, R. W., Brown, S. D., & Larkin, K. C. (1984). Relation of self-efficacy expectations to academic achievement and persistence. *Journal of Counseling Psychology, 31*, 356–362.

London, M., & Smither, A.J. (1995). Can multi-sourced feedback change perceptions of goal accomplishment, self-evaluation, and performance-related outcomes? Theory-based application and directions for research. *Personnel Psychology, 48,* 803-839.

Mansfield, R. S. (1996). Building competency models: approaches for HR professionals. *Human Resource Management, 35,* 7–18.

McKenzie, K., & Schweitzer, R. (2001). Who succeeds at university? Factors predicting academic performance in first year Australian university students. *Higher Education Research & Development, 20*, 21-33.

McLagan, P. (1996). Great ideas revisited: competency models. *Training and Development, 50,* 60–64.

Mirabile, R. J. (1997). Everything you wanted to know about competency modeling. *Training and Development, 51,* 73–77.

Mount, M. K. (1984). Psychometric properties of subordinate ratings of managerial performance. *Personnel Psychology, 37*, 687-702.

Muffo, J. (2001). Institutional effectiveness, student learning, and outcomes assessment. In R. D. Howard (Ed.), *Institutional research: Decision support in higher education*. (pp. 60-86), Tallshassee, FL: Association for Institutional Research.

Parasuraman, A., Zeithaml, V. A., & Berry, L. L. (1994). Reassessment of expectations as a comparison standard in measuring service quality: Implications for further research. *Journal of Marketing. 58,* 111-124.

Patterson, A., & Bell, J. W. (2001). Teaching and learning generic skills in universities: The case of 'sociology' in a teacher education program. *Teaching in Higher Education, 6,* 451-471.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17-59). San Diego: Academic Press.

Rainsbury, E., Hodges, D., & Burchell, N. (2002). Ranking workplace competencies: Student and graduate perceptions. *Asia-Pacific Journal of Cooperative Education*, 8-18.

Shimizu, T., Mizoue, T., Kubota, S., Mishima, N., & Nagata, S. (2003). Relationship between burnout and communication skill training among Japanese hospital nurses: A pilot study. *Journal of Occupational Health, 45,* 185-190.

Spencer, L. M., & Spencer, S. M. (1993). *Competence at work*, New York: Wiley.

Terenezini, P. T. (1989). Assessment with open eyes: Pitfalls in studying student outcomes. *Journal of Higher Education, 60,* 644-664.

Varney, G. H., & McFillen, J. (2000). Leading organizational change: A multi-method approach to teaching OD&C. *Organization Development Journal, 18,* 105-112

Warn, J., & Tranter, P. (2001). Measuring quality in higher education: A competency approach. *Quality in Higher Education, 7,* 191-198

NSSE AND RETENTION: DOES INTEGRATION AFFECT THE PROBABILITY OF LEAVING?

Raymond Hicks
Senior Research Analyst
Nava Lerer
Director

Office of Research, Assessment and Planning
Adelphi University

The focus of this paper is on the importance of early educational engagement in the retention of postsecondary students. Tinto (1975, 1987) argues that greater academic and social integration in college leads to higher rates of retention. Empirical tests of the claim have been mixed and a frequent criticism of such studies is that the variables used to construct the academic and social integration measures are not consistent across studies, making it difficult to replicate the results of individual studies. Questions on the National Survey of Student Engagement (NSSE), however, offer a way around the difficulty of generalization. NSSE, administered nationally to freshmen and seniors by the Center for Postsecondary Research and Planning at Indiana University, is designed to measure student engagement. Since many of the questions about engagement are concerned with various aspects of students' integration, by using the questions on NSSE to measure social and academic integration we hope to provide an easy and replicable way to examine the effect of integration on student retention.

To do this, we examine the relationship between responses on NSSE and student retention at one participating institution, Adelphi University. The results are very supportive of the idea that integration improves retention. After controlling for high school GPA, gender, and SAT scores, academic and social integration are significantly and positively related to retention—students who are more integrated are more likely to stay at Adelphi. By constructing measures of social and academic integration from questions on NSSE, we allow for easy replication of our results at other institutions.

Brief Literature Review

There is a voluminous literature on retention. While some studies examine the retention of adult students (Wlodkowski, Mauldin, & Gahn, 2001) or student-athletes (McArdle & Hamagami, 1994) or differentiate between students who drop-out and those who transfer to another institution (Porter, 2002), the main focus has been on the retention and graduation of traditional undergraduates (Gravely, 2003; Adelman, 1999; Astin, 1993). The majority of studies of persistence start from Tinto's model of student retention (Carbrera, Castaneda, Nora, & Hengstler, 1992; Kahn & Nauta, 2001). Put simply, Tinto's model contains a feedback loop: while students' goal and institutional commitments affect their academic and social integration (through the academic and

social system), integration in turn affects commitment which influences the dropout decision (Tinto, 1975; Tinto, 1987).

Empirical evidence for the validity of Tinto's model appears to be mixed (Cabrera, Castaneda, Nora, & Hengstler, 1992; Towles & Spencer, 1993; Braxton, Sullivan, & Johnson, 1997; Berger & Braxton, 1998; Berger & Millem, 1999; Brunsden, Davies, Shevlin, & Bracken, 2000; Elkins, Braxton, & James, 2000). Braxton, Sullivan, and Johnson (1997) examine 13 propositions from Tinto's model, finding support for only 5, including the importance of social integration. Brunsden, Davies, Shevlin, and Bracken (2000) test Tinto's entire model at once, finding little evidence in support of it. The problems have led some scholars to try to elaborate on Tinto's basic model by including new perspectives or by integrating Tinto's model with other arguments. Overall, though, there seems to be evidence that social integration is positively related to retention even if other aspects of Tinto's argument remain unsettled.

Alternatively, Draper (2003), suggests that one problem with testing Tinto's model is that operationalization of the key components is unclear and that many studies use different questions when constructing social and academic integration measures. This makes it difficult to replicate existing findings as it is difficult for other institutions to determine whether significant results are simply an artifact of the measure used in the initial study. This problem can be overcome by deriving measures of social and academic integration from survey instruments such as NSSE. First, NSSE is administered at a large number of colleges using the same set of questions, so results will be easily replicable. Second, the NSSE instrument includes numerous items that can be aggregated into scales to measure Tinto's two types of integration.

The National Survey of Student Engagement

Starting from the argument that students who are more engaged in college benefit more from their education than students who are less engaged, the National Survey of Student Engagement attempts to measure the degree of student engagement or the "time and effort students put into their studies and other educationally purposeful activities" (Kuh, Gonyea, & Palmer, 2001). NSSE asks about 70 questions—questions have been added or removed in different surveys—on a range of topics from the amount of work required in class to participation in extracurricular activities to the quality of the relationship with administrative personnel. Only seniors and first-year students are surveyed, which allows institutions to investigate its impact on students' opinions over time.

To make the results of the survey manageable, the developers of NSSE utilize factor analysis to devise benchmarks that "reduce the more than 60 questions on the NSSE survey to a handful of self-evident concepts" (Kuh, 2001). The resulting 5 benchmarks include only 41 of the items from the survey so a large amount of information is excluded. Four of the five benchmarks largely differ from Tinto's types of integration: "Active and collaborative learning" includes questions about classroom behavior, tutoring other students, the number of pages in students' papers, and discussing ideas with others outside of class. "Student interactions with faculty" includes talking to

faculty about grades, career plans, or ideas from class, working with faculty, and receiving feedback from faculty. The "level of academic challenge" benchmark includes components such as the number of hours spent preparing for class, the number of textbooks and written papers, emphasis of coursework, and campus emphasis on studying. Finally, "enriching educational experiences" includes items such as participating in co-curricular activities, community service, independent studies, study abroad, and contact with students from different backgrounds or with different beliefs. These four benchmarks, while including items related to social and academic integration, do not directly measure these concepts. Consequently, they have been excluded from the rest of the analysis.[1]

The last benchmark "supportive campus environment" benchmark roughly approximates Tinto's concept of social integration. It includes items such as relationships with other students, faculty, and administrators, as well as academic and non-academic support from the campus environment.

Brief Summary of the Methodology

Since a few items in the benchmark do not closely fit Tinto's social integration model and other items not included in the benchmark appear to be relevant, we created a new social integration scale. Our "social integration" scale drops the "campus environment provides support you need to help you succeed academically" item and includes the "evaluate your entire educational experience" and "encouraging contact among students from different… backgrounds" items. Although the item asking students to evaluate their entire educational experience may appear at first glance to be an academic integration item, a student's educational experience will include a strong social component. Moreover, Draper (2002) suggests that one of the components of social integration is how well the students enjoy being at their college which is similar to the evaluation of one's entire educational experience item in NSSE. The final scale consists of 7 items (alpha = .79).

We also created an academic integration scale which includes selected items corresponding to Tinto's measure from NSSE questions about class participation, discussing ideas from class with students and faculty, acquiring a broad general education, learning effectively, and academic support by the college. The final scale consists of eight items (alpha = .72). (The questions that comprise both scales appear in Table 1.)

[1] While all three are significant in bivariate logit regressions of retention, they all drop out of significance when control variables are included.

Table 1: Components of the Social and Academic Integration Scales

Social Integration Scale	Academic Integration Scale
1. Evaluation of entire experience at institution	1. Asked questions in class or contributed to class discussions
2. Institution emphasizes: helping cope with non-academic responsibilities	2. Came to class without completing readings of assignments
3. Institution emphasizes: providing the support needed to thrive socially	3. Discussed ideas from readings or class with others outside of class
4. Institution emphasizes: encouraging contact among students different economic, social, and racial/ethnic backgrounds	4. Experience at institution contributed to: acquiring a broad general education
5. Quality of relationships with other students	5. Experience at institution contributed to: learning effectively on own
6. Quality of relationships with faculty members	6. Institution emphasizes: spending significant amounts of time studying and on academic work
7. Quality of relationships with administrative personnel and offices	7. Institution emphasizes: providing the support needed to succeed academically
	8. Discussed ideas from readings or classes with faculty members outside of class

To test the argument of the paper, we used logit regression and focused on the one-year retention of Adelphi freshmen who responded to NSSE in the years 2000 through 2003. Logit analysis is the appropriate technique to use when the dependent variable is dichotomous—as it is here—because ordinary least squares does not return the most efficient parameter estimates. Because the error terms are not normally distributed, ordinary least squares may lead to faulty conclusions (Bohrnstedt & Knoke, 1994). Logit, on the other hand, computes log-odds ratios for each variable to determine the probability of an event occurring. To convert the log-odds to standard probabilities, one takes the anti-log. The dependent variable in the analysis will be one-year retention, coded as 1 if a student was retained and 0 if the student left Adelphi.

Brief Summary of the Data Sources

Student responses on the NSSE have been matched with demographic and retention information from Adelphi's database. Adelphi has participated in NSSE, which is administered to freshmen and seniors in the spring, for four years (Spring 2000 to Spring 2003). After excluding responses from seniors, each of the four NSSE files has been matched with the corresponding cohort file of Adelphi first-year students. So, the 2000 NSSE has been matched with the fall 1999 cohort; the 2001 NSSE data with the fall 2000 cohort; and so on. Matching the files led to a database of 585 entering students, of whom 77 left Adelphi and 508 were still enrolled after one year for a retention rate of 87 percent.

The supportive campus environment benchmark created by NSSE to assess institutions has been recreated at the individual level. That is, while NSSE created

aggregate benchmarks to derive scores for an entire institution, we have applied the same process to create benchmark scores for individual students. In addition, we have created individual scores on the 2 integration scales discussed above in order to assess Tinto's model. Variables used as controls are those found in the literature to affect retention: gender, high school GPA, and scores on the math and verbal components of the SAT.

Table 2: Descriptive Statistics

	N	Mean	S.D.	Min	10th %	90th %	Max
Supportive Campus Environment	566	60.0	18.4	0.0	36.1	83.3	100.0
Academic Integration	556	53.9	16.1	4.2	33.3	75.0	100.0
Social Integration	564	59.2	18.1	0.0	35.7	81.0	100.0
High School GPA	514	3.3	0.5	1.1	2.5	4.0	4.3
Gender	585	0.8	0.4	0.0	0.0	1.0	1.0
SAT – Math	430	52.8	7.8	27.0	43.0	63.0	80.0
SAT – Verbal	430	52.8	7.9	34.0	43.0	64.0	76.0

Results of the logit analysis

As a first step, we conducted bivariate regressions using the supportive campus environment benchmark and the two constructed integration scales as independent variables. The results of the analyses are presented in Table 3. All three measures are positive and significant at the .01 level or higher. As social or academic integration increases, the probability that an Adelphi student will return to Adelphi also increases. Remembering that 87 percent of Adelphi freshmen who responded to NSSE returned to Adelphi for their second year, we can get some sense of how the benchmarks affect the probability of staying at Adelphi by comparing students who scored in the 10th percentile to those who scored in the 90th percentile on each benchmark. For the two measures of social integration, students who scored in the 10th percentile had a probability of staying at Adelphi of a little more than 75 percent. The probability increased gradually so that students scoring in the 90th percentile had a 95 percent chance of staying at Adelphi. A similar picture is found with the academic integration scale. While those scoring in the 90th percentile on the academic measure had a 94 percent chance of remaining at Adelphi, those scoring in the 10th percentile had an 80 percent probability. This suggests that, while social integration, measured either using NSSE's benchmark or our revised scale, and academic integration are both significantly related to retention, social integration has a slightly larger effect.

Table 3: Bivariate Logit Results

	(1)	(2)	(3)
Intercept	-0.006	0.229	-0.138
	(0.384)	(0.430)	(0.387)
Supportive Campus Environment	0.034***		--
	(0.007)		
Academic Integration		0.034***	--
		(0.009)	
Social Integration			0.038***
			(0.007)
Number of observations	564	556	566
-2*log likelihood	401.789	404.435	409.664
Nagelkerke R^2	0.094	0.055	0.082

The next step is to determine whether the findings stand up to the inclusion of control variables for high school performance (high school GPA and verbal and math SAT scores) and demographic characteristics (gender). Results of these analyses are presented in Table 4. The only control variable that is significant is high school GPA; the other three control variables fail to reach conventional levels of significance. In all of the specifications, as high school GPA increases, the probability that a student will stay at Adelphi also increases. More importantly, the two social integration variables and the academic integration scale remain significant at the .01 level or higher.

Table 4: Multivariate Logit Results

	(1)	(2)	(3)
Intercept	-5.434***	-4.394**	-5.293***
	(1.700)	(1.743)	(1.697)
Supportive Campus Environment	0.035***	--	--
	(0.010)		
Academic Integration	--	0.032***	--
		(0.011)	
Social Integration	--	--	0.038***
			(0.010)
High School GPA	1.407***	1.432***	1.262***
	(0.400)	(0.410)	(0.403)
Gender	-0.512	-0.641	-0.662
	(0.471)	(0.482)	(0.491)
SAT – Math	0.001	0.000	0.014
	(0.032)	(0.033)	(0.033)
SAT – Verbal	0.031	0.020	0.025
	(0.032)	(0.033)	(0.032)
Number of observations	397	389	395
-2*log likelihood	220.165	214.857	215.465
Nagelkerke R^2	0.196	0.157	0.199

So what do these results mean? Using the logit coefficients, we can estimate the probability that a student will remain at Adelphi, given different values of the explanatory variables. In other words, we can estimate the impact changes in the benchmark scores have on the likelihood of retention, leaving all other explanatory variables constant. Based on the results, the key variables to examine are the 3 integration measures as well as high school GPA. For each of the three measures, 9 scenarios are presented: low (10^{th} percentile), mean (50^{th} percentile), and high (90^{th} percentile) secondary school GPAs and low (10^{th} percentile), mean (50^{th} percentile), and high (90^{th} percentile) benchmark scores. The results are presented in Tables 5 through 7. Because the probability of a student remaining at Adelphi is already high (87%), the computed probabilities will be relatively high as well. The key information to note in the analyses is the differences in probability caused by the explanatory variables.

Not surprisingly, the results confirm that, as high school GPA increases, students are more likely to stay in college. In fact, students who have a high school GPA in the 90^{th} percentile are more likely than average to stay, no matter the score on any of the three benchmarks. This is not to say, however, that the integration measures have no effect. The three tables show that, at a given high school GPA, as academic or social integration increases, the probability that a student will return to Adelphi increases, especially at low and average GPAs.

Supportive campus environment. At a high school GPA in the 10^{th} percentile, moving from a benchmark score in the 10^{th} percentile to one in the 90^{th} percentile

increases the probability of staying at Adelphi by 25 percent, from 65 percent to 90 percent. So even students who entered Adelphi with a below average high school GPA were slightly more likely than the average student to stay at Adelphi if they were very well socially integrated at Adelphi. The findings are similar for students with an average high school GPA. Students with a low benchmark are slightly more likely than the average student to drop out while students with an average or high benchmark are more likely to remain at Adelphi.

Table 5: Conditional probabilities: Supportive campus environment

	Low GPA	Average GPA	High GPA
Low benchmark	65.1%	84.6%	93.8%
Average benchmark	81.2%	92.7%	97.2%
High benchmark	90.7%	96.6%	98.7%

Social integration. The findings from our constructed scale of social integration are very similar to the findings from NSSE's supportive campus environment benchmark. Again, among students with a low GPA, there is a 25 percent difference in the probability of staying at Adelphi between those scoring in the 10^{th} and 90^{th} percentile on the social integration scale. Also, students who have a low integration score and an average GPA are less likely than average to say at Adelphi.

Table 6: Conditional probabilities: Social integration

	Low GPA	Average GPA	High GPA
Low benchmark	68.3%	85.0%	93.4%
Average benchmark	84.3%	93.4%	97.2%
High benchmark	92.9%	97.2%	98.8%

Academic integration. Although the academic integration variable does not perform quite as well as the social integration ones, it does demonstrate the importance of academic integration to retention. At a low GPA, there is a 20 percent difference in the probability of staying at Adelphi between students scoring in the 10^{th} and 90^{th} percentile on the academic integration measure. Students who scored in the 10^{th} percentile have a 71 percent probability of returning to Adelphi while those scoring in the 90^{th} percentile have at 92 percent probability of staying. Students with an average GPA who had a low score on the academic integration scale were as likely as the average student to return to Adelphi.

Table 7: Conditional probabilities: Academic integration

	Low GPA	Average GPA	High GPA
Low benchmark	71.0%	88.0%	95.4%
Average benchmark	84.0%	94.0%	97.8%
High benchmark	91.7%	97.0%	98.9%

Overall, then, the results lend support to Tinto's argument that academic and social integration contribute to greater retention. Students who feel more involved at an institution are more likely to stick around. Social integration appears, based on the results

found here, to be a little more important than academic integration. This conforms with Braxton, Sullivan, and Johnson (1997) who find that social integration is significant while academic integration is not. At Adelphi, the stronger influence of social integration may also reflect the fact that Adelphi has a large percentage of older and commuting undergraduates. Because Adelphi does not have a large on-campus social scene (about 75 percent of its undergraduates are commuters), it may be more difficult for the more traditional freshmen to integrate themselves socially. This lack of socialization may drive more freshmen away from Adelphi.

Limitations and caveats

The biggest caveat to this analysis is the timing of NSSE's survey. Tinto (1993) asserts that most departures occur in the first semester of college (1993, p. 58), but NSSE administrators do not distribute their survey until the spring semester. While the timing of the survey is beneficial in the sense that students have time to develop opinions about their institution, it does exclude freshmen who drop out before the survey was administered. And, if Tinto is correct that most students leave during the first semester, then the results of the analysis will be somewhat biased since many students who presumably are not engaged have already left college. However, to the extent that the model is correct, the bias in the timing of NSSE should make it more difficult to find a significant relationship between integration and retention.

A second caveat is the question of whether Adelphi's students are representative of college students in general. The more similar the typical Adelphi student is to the average college student, the more confidence we would have in the results. While overall Adelphi has a large proportion of non-traditional students, as mentioned above, its freshmen are largely traditional. The average age of first-time, full-time freshmen is 18.5 and only 2.4 percent of all first time freshmen are 25 years or older. Almost half (45%) of Adelphi freshmen live in campus housing. Adelphi freshmen, therefore, appear to be more or less representative of traditional college students (although fewer live on campus), so the results should be applicable to other schools.

Conclusions & Implications for Future Research

The originators of the National Survey of Student Engagement claim that the survey measures a student's engagement in college. They argue that students who are more engaged in college are more successful and get more out of college. Their argument is similar to Tinto's argument that social and academic integration at a university contributes to student retention. In both cases, students who are more involved at the institution gain more from the experience and are more likely to succeed than are students that are not as involved. In this paper, we have tested Tinto's argument using responses to NSSE and found that integration, especially social integration, has a significant effect on the decision to remain in school. Students who feel more integrated into the campus are more likely to stay at Adelphi. To the extent that these scales do measure academic and social integration, they suggest important new avenues of research open to institutional researchers.

The next—and most difficult—step in any such research is to examine the causes of social and academic integration (see also Braxton, Milem, & Sullivan, 2000). Why are some students more completely integrated into an institution than others? While Tinto (1993) briefly mentions it, he does so at the macro-level, attributing the decision largely to a combination of institutional policy and student personality. At individual schools, institutional characteristics are not helpful explanatory variables as they will not vary by student. This suggests that a micro-level explanation, one that focuses on individual students, is needed to explain integration.

References

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment.* Washington, DC: Office of Education Research and Improvement, US Department of Education.

Astin, A. (1993). *What matters in college? "Four critical years" revisited*. San Francisco: Jossey-Bass.

Berger, J.B., & Braxton, J.M. (1998). Revising Tinto's interactionalist theory of student departure through theory elaboration: Examining the role of organizational attributes in the persistence process. *Research in Higher Education, 39*(2), 103-119.

Berger, J.B., & Millem, J.F. (1999). The role of student involvement and perceptions of integration in a causal model of student persistence. *Research in Higher Education, 40*(6), 641-664.

Bohrnstedt, G., & Knoke, D. (1994). *Statistics for Social Data Analysis* (3rd ed.). Itasca, IL: F. E. Peacock.

Braxton, J.M., Milem, J.F., & Sullivan, A.S. (2000). The influence of active earning on the college student departure process: Toward a revision of Tinto's theory. *The Journal of Higher Education, 71*(5), 569-590.

Braxton, J.M., Sullivan, A.S., & Johnson, R. M. (1997). Appraising Tinto's theory of college student departure. In J.C. Smart (Ed.). *Higher Education: Handbook of Theory and Research, 12*, (pp. 107-164). New York: Agathon.

Brunsden, V., Davies, M., Shevlin, M., & Bracken, M. (2000). Why do HE Students drop out? A test of Tinto's model. *Journal of Further and Higher Education, 24*(3), 301-310.

Cabrera, A.F., Castaneda, M.B., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *Journal of Higher Education, 63*, 143-164.

Draper, S.W. (2003, May 7). *Tinto's model of student attrition.* Retrieved July 1, 2003 from Web site: http://www.psy.gla.ac.uk/~steve/localed/Tinto.html

Elkins, S.A., Braxton, J.M., & James, G.W. (2000). Tinto's separation stage and its influence on first-semester college student persistence. *Research in Higher Education, 41*(2), 251-268.

Gravely, A. R. (2003, May 18-21). U*sing logistic regression to assess the impact of first-year experience programs on student retention.* Paper presented to the Association for Institutional Research Annual Forum, Tampa, FL.

Kahn, J.H., & Nauta, M.N. (2001). Social-cognitive predictors of first-year college persistence: The importance of proximal assessment. *Research in Higher Education, 42*(6), 633-652.

Kuh, G. (2001). Assessing what really matters to student learning: Inside the National Survey of Student Engagement. *Change, 33*(3), 10-17, 66.

Kuh, G, Gonyea, R.M., & Palmer, M. (2001). The disengaged commuter student: Fact or fiction? *Commuter Perspectives, 27*(1), 2-5.

McArdle, J. J., & Hamagami, F. (1994). Logit and multilevel logit modeling of college graduation for 1984-1985 freshman student athletes. *Journal of the American Statistical Association, 89*, 1107-1123.

Porter, S.R. (2002). Including transfer-out behavior in retention models: Using the NSC enrollment search data. *AIR Professional File, 82*.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research, 45*, 89-125.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago: University of Chicago Press.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition* (2nd ed.). Chicago: University of Chicago Press.

Towles, D E. & Spencer, J. (1993). The Tinto model as a guide to adult education retention policy. *Catalyst, 23*(4), 22-27.

Wlodkowski, R.J., Maudlin, J.E., & Gahn, S.W. (2001). *Learning in the fast lane: Adult learners' persistence and success in accelerated college programs*. Lumina Foundation for Education New Agenda Series Volume 4, No. 1.

USING GRADES ANALYSIS TO IMPROVE TEACHING AND LEARNING

Ebenezer F. Kolajo
Director of Institutional Research
Cecil Community College

Grades are important to students, parents, and employers. Grades are used for admissions, for scholarships, for employment, and for special awards. No wonder some students would do anything for grades just like money! If well managed, grading can be a powerful tool for enhancing learning. If not well managed, the focus of grading can deter learning by encouraging cheating and other subversive attitudes. As Walvoord and Anderson (1998) put it, "…grading is a socially constructed, context-dependent process that serves many roles and that, if well managed, can be a powerful tool for learning." (p. 10).

Many education observers today question the validity of using grades to measure student learning because of perceived pervasiveness of grades inflation. The public confidence in grading is steadily eroding. Many people now think that higher grades can be obtained with little effort. As reported by Merrow (2003), even though almost a third of college freshmen are enrolled in one or more remedial courses, nearly everyone receives A's and graduate with honors. The growing concern is that easy grading tends to erode deeper learning.

To the extent that grades remain the centerpiece for awarding major rewards and accolades, grade-oriented behavior may continue to dominate learning-oriented behavior. However, instructors can use the grading system to stimulate learning-oriented behavior in classrooms. Thus, existing student grades data can be used to inform classroom/instructional decision-making that can enhance teaching and learning.

Objectives

The main objective of this study is to demonstrate how student grades analysis can be used to evaluate academic performance and inform management decision-making for the purpose of enhancing continuous improvement of teaching and learning. Specific objectives that will be addressed include:

Are there differences in the grades distribution awarded by part-time and full-time faculty teaching similar courses? Elucidate the extent of any significant difference between full-time and part-time faculty insofar as pass rate, withdrawal rate, or failure rate is concerned. If any difference exists, what is the implication for teaching and learning?

Is there any pattern to the grades distribution of students by gender? Can grades distribution analysis be used to identify at-risk students? If a discernible pattern exists, how can grading and grades analysis be used to improve learning in the classroom?

Examine the effect of teaching experience (number of semesters an instructor have taught a course) on course grades distribution.

Literature Review

Some critics of grading have become so skeptical to the extent of calling for discontinuing the use of grades in schools and colleges (Edwards & Edwards, 1999). Critics opined that the deleterious effects of grading far outweighed its benefits. They thought that grades have very limited usefulness to employers, because most employers look for well-balanced characteristics including creativity, responsibility, and team-oriented behavior. Cohen (1984) reinforced this feeling by saying that neither high school nor college grades are valid in predicting occupational success in life. Kohn (1994) suggested that grades mainly foster comparison and competition, which are destructive to students' self-esteem and relationships and are counterproductive to the quality of learning.

Pascarella and Terenzini (1991) observed that the grading process, as well as student-faculty and student-peer interactions, has an enduring positive influence on student learning. According to Walvoord and Anderson (1998), the grading process plays four roles (evaluation, communication, motivation, and organization), which should be managed to enhance learning. In doing so, teachers are warned against three false hopes of grading, namely: total objectivity, full agreement, and student motivation for learning.

The need for warnings against false hopes of grading is bolstered by Ellsworth (2002) in the following statements: "We professors prepare to man the realms of Schylla and Charibdus. It is time honored. Many things in an education resemble the proverbial spot between a rock and a hard place, none any more surely than grades. Who of us, in our historic robes has not faced down the tyranny of the curve and won? So too, must this year's adventurers. Of course, we all know the inscrutable value of an 'A'. In our GPA are those grades that are earned and unearned, those we cheated for and those we got cheated receiving. The B in Chemistry I barely grasped, and the A in Biology, a good joke on the professor—since I knew more than he did. The 'A' in French was a cheat all the way around, since the curve allowed me, a dysfunctional speaker and reader, to surpass other students. It was the worst of times … but I digress" (p.626).

Ellsworth (2002) suggests that, in a proactive academic journey, both professors and students can work together to build and strengthen academia. Milton, Pollio, & Eison (1986) remark that "it is not a symbol of rigor to have grades fall into a 'normal' distribution; rather, it is a symbol of failure—failure to teach well, to test well, and to have any influence at all on the intellectual lives of students" (p. 225). Skillful teachers who align tests and assignments with teaching for learning can use grading for institutional assessment. Such teachers use grades for motivating students to focus on deeper learning and, in turn, use feedback from grading for improving teaching (Walvoord & Anderson, 1998). Yet, research has shown that there are differential grading standards across various disciplines (Strenta & Elliot, 1987; Warren, 1971).

Grades inflation has been attributed to student rating of instructors and courses (Greenwald & Gilmore, 1997; Powell, 1977). On the other hand, Marsh and Roche (2000) argue that the general notions that students' evaluations of teaching are considerably biased by low workload and grading leniency are nothing but myths. Their structural equation models' results suggest that perceived learning and prior characteristics, rather than bias, account for much of the grade-student evaluation of teaching relation.

Are students so motivated to learn regardless of the grades they would receive in a course? Pollio and Beck (2000) note that while learning is the desired outcome of higher education, some students are bent on receiving a good grade even without learning. Thus, they distinguish between learning-oriented and grade-oriented students. Learning-oriented students have a number of positive educational attributes, whereas grades-oriented students "view college as a crucible in which they must endure continual testing and evaluation" (Pollio & Beck, 2000). Similarly, they distinguish between learning-oriented instructors and grades-oriented instructors. The former are flexible in their teaching and evaluation practices and encourage cooperation among students. The latter, on the other hand, believe that success in life depends on grades and only teach to the "best and brightest." They further note that while grade orientation may force one to learn, it could also lead to psychological reactance, and that too much emphasis on grades can actually destroy learning orientation.

The social context of grades makes motivation for learning not a singular impetus but a component of other factors, including evaluation, communication and organization (Walvoord & Anderson, 1998). Kleinman (1997) observed that students' learning and the enjoyment of learning increase when instructors base their grading system on meeting minimum performance standards. This grading system is based on assessing achievements through outcomes, whereby students are not solely rated on performance but also on ability to learn a given skill.

Methodology

Academic achievement of Cecil Community College students was investigated. The College is a 2-year, associate degree awarding institution, located in the northeast corner of the state of Maryland. Study analysis is limited to three departments: English, Mathematics, and Business. These are the departments that enroll the bulk of students at the College every semester. Three-year data are used to smoothen out the effect of any inter-temporal differences on the variables. Correlation analysis is used to determine the linear relationships among the variables of interest, including success rate, failure rate and withdrawal rate by departmental courses and faculty tenure. In addition to the standard descriptive statistical analysis, inferential statistics are used to test alternative hypotheses.

In his book, *Becoming a Critically Reflective Teacher*, Brookfield describes the good practices audit as a process whereby teachers collaboratively and systematically explore insights and responses that can address common problems. The English/ Reading

department at this college has adopted an approach called the C-Standards for grading their courses. The C-Standards is built on critical reflection and creates ground rules for participative discourse among faculty. At the beginning of each fall semester, all full-time and part-time English and Reading faculty hold a grade norming session for freshman composition as part of the College's implementation of Maryland statewide standards for a 'C' grade in English composition (Bell, 2003). Consequently, this process is expected to reflect a high level of congruity in the grades distribution of the department's courses and faculty.

Data Sources

This is a case study of Cecil Community College, and its institutional database of course grades by student and by instructor for three years (2000- 2002) are used. Grades data provide a rich source of information for analyzing teaching and learning and can serve as a complementary resource for general assessment.

Results

Table 1 below shows the correlation coefficients between the numbers of semesters that a faculty taught a given course and the corresponding grades distribution. It was apparent that there was significant positive correlation among departmental courses with respect to the grades earned by students and the number of semesters taught by faculty. Correlations between faculty tenure and business courses' grades distribution were comparatively low but significant for grades A, F and W. For the English department, the correlation coefficients for faculty tenure with respect to grades distribution were low, ranging from .254 for grade W to .526 for grade B. The coefficients were particularly significant for grades A, B, C and F. With respect to Math courses, the correlation coefficients for faculty tenure were very low and none of them was significant. The implications of these coefficients will become apparent in later discussions.

Table 1. Correlation analysis of grades with respect to the number of semesters taught and faculty tenure across departments

Dept	Variables	Grades distribution					
		A	B	C	D	F	W
Business	# of semesters taught	.693 (.000)**	.654 (.000)**	.491 (.000)**	.443 (.000)**	.475 (.000)**	.536 (.000)**
	Faculty tenure	.277 (.022)*	.142 (.246)	.160 (.193)	.228 (.062)	.389 (.001)**	.320 (.008)**
English	# of semesters taught	.660 (.000)**	.768 (.000)**	.762 (.000)**	.474 (.005)**	.629 (.000)**	.757 (.000)**
	Faculty tenure	.393 (.022)*	.526 (.001)**	.401 (.019)*	.254 (.147)	.396 (.021)*	.254 (.147)
Math	# of semesters taught	.641 (.000)**	.550 (.000)**	.471 (.000)**	.293 (.035)*	.678 (.000)**	.850 (.000)**
	Faculty tenure	.172 (.223)	.215 (.127)	.173 (.219)	.069 (.625)	.012 (.935)	-.060 (.673)

** Significant at P<0.01 * Significant at P<0.05

There were inter-departmental differences in grades distribution by faculty tenure. As shown in Table 2, differences in grades by faculty tenure in the business department were significant at the 5 percent level for grade A. The failure and withdrawal rates were highly significant at the 1 percent level between the full-time and part-time business faculty. There were no significant differences in the B and C grades awarded by both faculty types. These results send a signal to weak students taking business courses to avoid the full-time faculty if they did not want to fail or withdraw.

In the English department, however, there were significant differences mainly in the distribution of quality passes, such as grades A, B, and C. Grades B and C were significant at the 5 percent level and grade A at the 10 percent level. There were no significant differences in the withdrawal rates of students in English courses taught either by full-time or part-time faculty. Significant at the 5 percent level, there was a statistical difference in the failure rate. The C-Standards' impact on grades distribution in the English department was apparent only when one looked at the percentage distribution of grades by full-time and part-time faculty but not actually supported statistically.

The results for Mathematics department's grades distribution showed that there was no statistical difference in the grades awarded by both part-time and full-time faculty. None of the grades was statistically different from one another. The implication of these results was that it would not matter whether a student took a math course with a part-time or full-time faculty, the grade earned would be the same.

Table 2. Grades distribution by faculty type across departments, Cecil Community College (AY 2000-02)

Dept	Faculty tenure	# students	% students taught	t-values for test of equality of means between full-time and part-time faculty grades distribution					
				A	B	C	D	F	W
Business	Full time	2,407	66	2.34	1.18	1.35	1.94	3.43	2.74
	Part time	1,231	34	**			*	***	***
English	Full time	933	47	1.96	3.50	2.47	1.49	2.44	1.49
	Part time	1,052	53	*	**	**		**	
Math	Full time	1,373	57	1.26	1.55	1.25	0.47	0.08	-0.42
	Part time	1,043	43						

*** Significant at P<0.01 ** Significant at P<0.05 *Significant at P<0.10

Withdrawal rate was highest in the Math department, followed by the English department. In Developmental Math courses, withdrawal/failure rates were comparatively higher on average for the part-time faculty. This suggests that full-time faculty might preferably be assigned to teach more of those courses. In business courses, pass rates were comparatively higher for part-time faculty. Over the three-year period analyzed, 40% and 27% of the students in courses offered by part-time faculty earned A and B grades, respectively, compared to 35% and 20% for the full-time faculty. This raises the question as to whether the part-time business instructors are more lenient in grading than the quasi-permanent instructors. A reflexive look at these results may suggest a means of standardization that could enhance teaching and learning.

Lack of continuity in the business courses taught was observed. Some courses were taught just once or twice in 3 years. There is need to organize and regularize course offerings with respect to frequency. This has two implications: lenient grading and advising. Should course offerings be demand or supply driven, especially in this era of dwindling budget allocation to education? Proliferation of courses or a thinly spread course offerings can cause cannibalization of other courses that might result in lenient grading as a reward for students' patronage. In effect, course offerings need to be demand and supply driven to avoid unnecessary competition. Regularizing course offerings can synchronize proactive student advising with course scheduling and transfer. This can help to minimize loss of credits upon transfer from community colleges to the 4-year institutions and also facilitate cohesion of teaching and advising.

Table 3 presents the results of grades distribution by gender across departments. Gender disparity is obvious in the grades analysis conducted. Quality grades skew in favor of female students, except in business department where they are fairly proportional. Whereas sixty percent of the students who took credit courses in English department over the study period were female, they accounted for 72 percent of the A grade. Albeit male students were less represented in Mathematics and English courses, they accounted for a disproportionate component of the weak passes or failing grades (i.e.

C, D, and F). However, independent samples t-test for equality of means shows that grades distribution by gender was not significant in all the three departments analyzed.

Table 3. Grades distribution by gender across departments, Cecil Community College (AY 2000-02)

Dept	Gender	No. of students	Percent of total students	Percent of respective grade earned					
				A	B	C	D	F	W
Business	Female	2,035	56	56	57	57	51	54	56
	Male	1,603	44	44	43	43	49	46	44
English	Female	1,189	60	72	63	50	34	56	61
	Male	796	40	38	37	50	66	44	39
Math	Female	1,480	61	68	64	57	56	59	60
	Male	937	39	32	36	43	44	41	40

Research has shown that there are marked differences in grading standards across various disciplines (Smith, 1992; Strenta & Elliot, 1987; Warren, 1971; Bradburn & Griffith, 2003). Studies of grading differences among disciplines showed that students in the sciences obtained lower grades than their colleagues in social sciences and humanities, even though they had higher pre-college academic achievement. According to the study that Merrow (2003) reported on, the hardest A's were in the natural sciences and in advanced Math courses.

Table 4 shows the percentage grades distribution and mean grades point average (Mean GPA) by course level across departments. The overall mean GPAs of students taking first-year and second-year courses increased from first year to second year in the Business and English departments. On the other hand, mean GPAs decreased from first-year to second-year courses in Mathematics department. In general, Mathematics has the least overall mean GPA (2.44), followed by English (2.63) and then Business, with the highest GPA of 2.67.

Table 4. GPA computations by course level, Cecil Community College (AY 2000-2002)

Department	Course level	No. of students	% A	% B	% C	% D	% F	% With-drawn	Mean GPA
Business	1st Year	3155	34	22	11	4	16	13	2.64
	2nd Year	329	51	24	9	0	7	9	3.20
	Overall	**3484**	**36**	**22**	**10**	**4**	**15**	**12**	**2.67**
English	1st Year	1859	21	30	25	3	8	13	2.60
	2nd Year	118	19	31	16	3	8	26	2.81
	Overall	**1977**	**20**	**30**	**25**	**3**	**8**	**14**	**2.63**
Math	1st Year	693	21	22	17	7	11	22	2.45
	2nd Year	107	21	18	21	7	12	21	2.35
	Overall	**800**	**21**	**21**	**18**	**7**	**11**	**22**	**2.44**

Conclusions & Implications for Current Practice

Public confidence in the grading system in schools and colleges is eroding, but the award of grades can be managed by linking grading to learning and continuous improvement in teaching. Grading is a powerful instrument that can be used to harness teaching and learning. Grading should not be used as a whip for unenthusiastic learners but as a tool for encouragement and motivation.

Male students tend to represent at-risk students in many courses because the likelihood of them obtaining a failing grade is greater. However, male students are able to compete at par with female students only in computer-related courses. The mean GPA of female students is higher than the male's. Grades analysis can be used to identify subgroups of students who might benefit from intervention strategies capable of improving course completion and overall retention.

There is a pattern in the drop out/withdrawal rate of students taking the same course. By becoming a critically reflective teacher, teaching and learning can be enhanced if instructors could share their experiences. Experiences that make student success rate greater in a given course taught by a particular instructor than those of other instructors teaching the same course can be shared in a critically reflective manner.

While standardization of grading might help to minimize grade disparities among instructors, differences in the grades distribution of courses taught by the English department part-time and full-time instructors were statistically significant. A further research into disparity in teaching and learning between full-time and part-time instructors deserves closer attention. Especially that the use of part-time instructors in higher education has come to stay, establishing unified standards that reflect deeper learning will be very important.

Grades analysis can inform the establishment of academic support programs to promote success in courses where high proportions of students frequently withdraw or fail. Grades analysis can be used for departmental and general education assessment provided grading is considered as a connected process, which can be used to implement

changes in teaching based on feedbacks. This approach to grading is based on a systematic investigation of the connection between teaching and learning known as classroom research (Cross, 1990).

References

Bell, G. (2003). E-mail correspondence.

Brookfield, S.D. (1995). *Becoming a critically reflective teacher*. San Francisco: Jossey-Bass.

Cohen, P.A. (1984). College grades and adult achievement: a research synthesis. *Research in Higher Education, .20*(3), 281-93.

Cross, K.P. (1990). Classroom research: helping professors learn more about teaching and learning. In P. Seldin (Ed.), *How administrators can improve teaching: Moving from talk to action in higher education*. San Francisco: Jossey-Bass.

Edwards, C. H. & Edwards, L.. (1999, May-June). Let's end the grading game.*The Clearing House, 72*(5), p.260 (4).

Ellsworth, J. (2002, December). The graded journey. *College Student Journal*, *36*(4), p.626.

Greenwald, A. G. and Gilmore, G. M. (1997). Grading leniency is a removable contaminant of student ratings. *American Psychologist, 52*, 1209-1217.

Marsh, H. W. & Roche, L. A. (2000, March). Effects of grading leniency and low workload on students' evaluations of teaching: popular myth, bias, validity, or innocent bystanders? *Journal of Educational Psychology, 92*(1), p.202.

Kleinman, I. (1997, May). Grading: a powerful teaching tool. *The Journal of Physical Education, Recreation & Dance, 68*(5), p.29.

Kohn, A. (1994, October). Grading: the issue is not how but why. *Educational Leadership, 52*(2), p.38.

Merrow, J. (2003, June 18). Easy grading makes 'Deep Learning' more important. *USA Today,* Retrieved from http://www.iub.edu/~nsse/articles/USTODAY_com%20\%20Easy_%20grading%20makes.

Milton, O., Pollio, H. R., & Eison, J. A. (1986). *Making sense of college grades.* San Francisco: Jossey-Bass.

Pascarella, E.T., and Terenzini, P. T. (1991). *How college affects students.* San Francisco: Jossey-Bass.

Pollio, H. R. & Beck, H. P. (2000). When the tail wags the dog. *Journal of Higher Education, 71*(1).

Powell, R. W. (1977). Grades, learning, and student evaluation of instruction. *Research in Higher Education*, *7*, 193-205.

Smith, D. L. (1992). Validity of faculty judgments of student performance: Relationship between grades and credits earned and external criterion measures. *Journal of Higher Education,.63*(3), 329-340.

Strenta, A. C., & Elliot, R. (1987). Differential grading standards revisited. *Journal of Educational Measurement, 24*, 281-91.

Warren, J. R. (1971). College Grading Practices: An Overview. Princeton, N.J.: Educational Testing Service.

Walvoord, B. E. and Anderson, V. J. (1998). *Effective grading: A tool for learning and assessment*. San Francisco: Jossey-Bass.

UNDERSTANDING GATEWAY COURSE EFFECTS IN BIOLOGY: AN APPLICATION OF MULTILEVEL MODELING TO CURRICULUM ASSESSMENT

Paula Maas
Assistant Dean of the School of Science
Raymond Barclay
Institutional Research

The College of New Jersey

Abstract

Curriculum transformation at The College of New Jersey, a selective public college, has led to much discussion of current curricula sequences and their efficacy and impact. To this end, we are undertaking a retrospective cohort study aimed at understanding gateway course impacts and curricular sequence outcomes within a biology curriculum. This is being analyzed statistically using a two-tiered multilevel modeling procedure (course-level and section-level). By undertaking this retrospective statistical analysis, we hope to provide leadership for subsequent development of a research framework design that will provide key decision makers with information needed to assess the current curriculum transformation for science. This partnership between institutional research and those undertaking the actual academic planning is not only critical for supporting a conceptual base of the new model for science, but also to inform additional curricular and instructional assessment efforts across the college.

Background and Significance

Curriculum Sequence Function: Gatekeeper or Gateway

Often, students perceive introductory science and mathematics courses as competitive, difficult and intimidating, taking on a "gatekeeper" role in the curricular sequence (Van Valenburg, 1990). Andrade (2001) cites a national report (The Research Corporation, 1990) that finds that the result of professors' interaction with and teaching of the most accomplished students often becomes the determinant of who become the potentially good (e.g. B) students. This situation is often exacerbated by expectations that the "new" generation of high school students will be better prepared. This is because enrollment management strategies have become more focused on 'selectivity' as a key admissions criterion, a necessary goal for an institution that has a desire to maintain and enhance a competitive profile valuing academic excellence. Despite the emphasis on "gatekeeping," these introductory science and mathematics courses also have a secondary function within the curriculum, to be an important first step in a curriculum sequence, preparing and motivating students for long-term success (Andrade, 2001).

Evaluation of college science curricula

Andrade (2001) undertook a comprehensive literature review of evaluation of college science curricula and found that post-secondary science evaluations are categorized by five types: anecdotal (Coppola, 1995; Magner, 1996), student-level satisfaction ratings (Johnson & Leonard, 1994), final examination and course grade comparisons (Hershberger & Plantholt, 1994; Johnson, 1995; Lomen, 1992; Penn, 1994; Tidmore, 1994), efficiency studies (Andrade, 2001; Felder, et.al, 1993; Ratay, 1994), and combinations (Felder, Felder, Mauney, Hamrin, & Dietz, 1995). It does not appear that there has been much research devoted to understanding how section-level differences within a curriculum affect student-level achievement.

Multi-level modeling and student assessment

Institutional research has seen significant growth over the past decade in the use of multi-level modeling techniques to analyze data on student, faculty, and institutional effects (Ethington, 1997, Patrick, 2001; Porter & Umbach, 2001). Procedures for multi-level modeling are specified by Heck and Thomas (2000), Raudenbush and Bryk (2002), and Reise and Duan (2003). The primary reason for the field's movement toward such techniques is the acknowledgement that higher education is a complex hierarchical organizational structure that requires the researcher to carefully negotiate how he or she characterizes the unit under investigation. For instance, students can be nested within class sections, majors, departments, and/or institutions, but a research model that accounts for the data at only one level (e.g., the student level) may miss-estimate effects on the student outcome(s) in question. This dilemma is often referred to as the *unit of analysis* problem and has been a topic of concern in the college student learning and assessment literature for several years (Patrick, 2001; Ethington, 1997; Pascarella, 1985; Pascarella & Terenzini, 1991; Weidman, 1989).

The miss-estimation of effect sizes usually results from the researcher imposing an ordinary least squares (OLS) regression framework upon data with a multi-level character. Researchers do this in two ways. First, the researcher might disaggregate higher order variables to the individual level and this violates one of the primary assumptions that underlie OLS, that observations are independent of one another (Ethington, 1997). For instance, students in the same class sections have a set of common experiences that result in levels of interdependence. By disaggregating, we may underestimate the standard errors and fail to capture positive intraclass correlations that stem from the within group variance, thereby incorrectly rejecting the null hypothesis (Patrick, 2001). In addition, by disaggregating to the individual-level, the researcher has at least implicitly made a judgment that the higher order variables have impacted the individual-level data in the same way (Ethington, 1997). The second way that researchers often negotiate the unit of analysis problem is by relating aggregate level relationships to the outcome in question. This strategy often leads to what has become known as aggregation bias or the ecological fallacy (Patrick, 2001). The primary problem with this strategy is that it does not account for within-group variability, which often accounts for the majority (80-90%) of total variation (Ethington, 1997). The researchers believe that the creation of a separate model for students within sections for each core course in the curriculum will enable a better

understanding of the variation within and between sections. Ethington (1997) notes that the issues related to aggregation/disaggregation are adequately dealt with because multilevel modeling estimates:

- a separate equation within each group incorporating a unique random effect for each organizational unit
- variability in these random effects is accounted for when estimating standard errors (i.e., parameter and standard errors are estimated separately);
- heterogeneity of variance, by examining the variation in coefficients across groups and modeling this variation as a function of group or institutional characteristics
- effects of variables at Level-I or Level-II into one model by utilizing both individual and aggregate measures (p. 169)

Research Framework

Objectives

The primary goal of this research is to undertake a retrospective analysis that examines the efficacy of a core biology curriculum for student learning. The secondary goal is to utilize multilevel modeling techniques to appropriately account for the hierarchical nature of the research context. This methodology should help us improve our ability to estimate the effects of our previous curriculum, and perhaps a transformed curriculum in the future. Finally, we hope this study serves as a model for how institutional research can collaborate with academic planners, such as deans of a school of science or science faculty, and provide leadership for a process of creating a useful and responsible formative assessment design.

It is important to note that our intentions are not to provide the reader with an efficiency analysis. Many models that purport to be assessing "learning" usually only assess program attrition (pass/fail rates) and possibly model attrition probabilities at key stages. Rather, we have followed a set of cohorts through the given curricular sequence and attempted to identify what was distinct about the developmental trajectories of various groups, that is, what covariates influenced these trajectories.

This research attempts to look more broadly at how students move from one course to the next within a curriculum framework by carefully reviewing student-level and section-level variability within the core of the overall curriculum. In particular, we will review descriptively how students function within the tracks and course respectively. We will then attempt to understand what may be unique about a course in the larger framework, how levels of achievement influence movement of a student to the next stage, and how student and section-level characteristics work to influence this movement and their respective contribution to learning.

Biology curriculum before 2003

The Biology curriculum at the college, like most science curricula, follows a prescribed sequence of courses, designed to give students a foundation of natural science knowledge on which upper-level courses are based. While there is a degree of flexibility in terms of length of time (number of semesters) needed to complete the sequence, the sequence itself is inflexible, with each course having as its pre-requisite the successful completion of the preceding course or courses.

Typically, a curriculum that has a strict sequencing framework also has more than one gateway course because there are multiple specific courses that must be taken in order with successful completion of the first before commencement of the second. Thus, the science curriculum has several gateway courses which interact with one another and therefore, students may encounter difficulties and successes while in the curriculum in various combinations. For instance, a student may be very successful in General Biology I and II, but encounter difficulty with General Chemistry I or II. Anecdotal evidence suggests that some students leave the Biology major after poor performance in General Chemistry, despite adequate or above average performance in General Biology. Furthermore, the Biology major has a second tier of gateway courses, Cellular and Molecular Biology, Genetics and Organic Chemistry. Some faculty in that department believe that potentially successful students exit the major at this later point in the sequence due to poor performance (or at least perceived poor performance), after "making it" past the first "gate".

Sample

The data for this study came from a two-stage sampling process. First, section-level data was sampled for seven foundational courses in the "Core Curriculum" between the fall of 1995 through the spring of 2003. The sample includes all fall, spring, and summer terms for the given timeframe. The second stage of the sampling process separated those who declared Biology, Biology Teaching, or Biology Pre-Medicine as a major at the time of admissions from non-majors for the period 1996 through 2000. The final year of this time frame was selected for the student data because the vast majority of students who participate in the curriculum have finished their respective core sequence by the second term of the sophomore year.

Dependent variable

Course pass/fail rates are often viewed as inadequate objective measures of student learning. Andrade (2001) nicely frames the dilemma in the context of assessing the impact of curricular and instructional reform:

> A high failure rate may imply high academic standards, or it may indicate curricular or instructional problems. Similarly, an increase in pass rates could be interpreted as the result of lowered standards, or it could reflect a more coherent curriculum and/or improved instructional strategies…In addition, a primary focus

on course pass/fail rates ignores student patterns in terms of withdrawals, incompletes, and repetition of the course (p. 4).

This analysis has developed a strategy for circumnavigating many of the issues that Andrade raised about utilizing course grade. The dependent variable utilized in this analysis as an index of individual student performance within the curriculum is the highest/last interval-level grade attained for each of the following core courses: General Biology I, General Biology II, Cellular & Molecular Biology, Genetics, and Organic Chemistry I. The interval level grade functions as an index as opposed to a variable such as pass/fail rate with less discriminating value. Also, highest interval-level grade attained for each course is weighted by *number of attempts* for each course. This enables the researcher to factor in withdrawals, incompletes, and repetition patterns for the course. The researchers did have a concern about how to handle students who withdrew from the course without ever having received at some point an interval-level grade. As it turns out, the number was very few, for instance in General Biology I (N=630) it was less than 10 and these students were assigned a 0 as their grade.

Interval level grade distributions for the biology department are on the lower side of the college-wide department-level grade distributions, but do not show the excessively high or excessively low means or skewed distributions. It should also be noted that part of the purpose of this retrospective analysis is to understand the degree section-level differences vary on the dependent variable. This is because part of the impetus behind curriculum transformation is to support instructors in the implementation of assessment protocols that directly relate to distinct competency-based performance standards across a given curriculum and within courses. Hence, if significant variance does exist in the current analysis between sections, we need to understand the degree and sources of the variance.

Independent variables: Individual level, section level

In Pascarella's General Model for Assessing Change (1985) and subsequent work carried out with Terenzini (1991), they developed a causal model that addresses the unit of analysis problem while attempting to understand how student learning and cognitive development is influenced in a post-secondary setting. Their model postulates that student learning and development are a function of a student's background (socio-demographic), pre-college characteristics (ability and experience), college experience (social and academic), and the organizational and environmental characteristics of the institution.

For this analysis, we categorized individual-level independent variables into three clusters: (1) socio-demographic, (2) academic preparation & ability, and (3) biology sequence experience. Socio-demographic variables include minority (black and non-black Hispanic =1, other = 0), and admittance type (regular, first-time full-time admits = 1; those admitted as transfers or a special admit category such as an Educational Opportunity Fund participant = 0). Gender was not included as a variable because, although it showed significance for General Chemistry I and II (not included in this analysis as explained above), we found no significant differences in initial exploratory

analyses for the five core courses examined. Second, the academic preparation and ability cluster includes SAT Verbal score, SAT Math score, number of science AP courses, and the number of developmental math courses attempted at The College (Basic Computation, College Algebra, & Pre-Calculus). Third, the Biology sequence experience cluster includes an achievement index for each of the following: Calculus I, prior core Biology courses, and prior core Chemistry courses. Each index is an aggregated measure of the highest interval-level grade(s) attained within the respective core taken prior to the student achieving his or her highest/last interval-level grade for the core course being modeled as the dependent variable.

For the section-level independent variables, we utilized class size, status of instructor (either adjunct or tenure-track), and average class GPA (average GPA of all participants in class section, majors and non-majors).

Analysis

Step 1: A one-way random effects ANOVA base model

First, we estimated a base model that is equivalent to a one-way ANOVA. This model is known as a fully unconditional model because there are no Level-I or Level-II predictors specified in the model (Raudenbush & Bryk, 2002). The primary purpose of modeling at this stage is to disentangle how much student-level variance for the dependent variable (highest interval grade) is attributable to the within section variance and how much is attributable to the between section variance. For each of the models, we calculated an intraclass correlation (ICC, Table 1) to decompose the variance (Ethington, 1997).

The ICCs ranged from 0.6 to 0.01. Three of the courses (General Biology I, II, and Cellular and Molecular Biology) were modest, but were significant enough to warrant entering into a multilevel modeling procedure. We did not include the other two (Genetics and Organic Chemistry I) in a model because they had very slight ICCs and non-significant chi-square results, which indicate that the average within section interval-level grade does not significantly vary across sections. This is perhaps not surprising, since fewer individual instructors teach these classes. After calculating the ICCs, we next began to enter independent variables for each course model.

Table 1: Intraclass Correlations

BASE MODEL: Proportion of Variance *(Between & Within)*	Proportion of Variance in mean highest interval-level grade attained due to *between-section* differences *(intraclass correlation*).	Proportion of Variance in mean highest interval-level grade attained due to *within-section* differences.
General Biology I	5.36	94.64
General Biology II	6.61	93.39
Cellular & Molecular Biology	3.77	96.23
Genetics	0.10	99.90
Organic Chemistry I	1.23	98.77

n.b. Typically for Genetics each semester there is one lecture section with three associated laboratory sections, all taught by the same instructor. One professor usually teaches in the fall, a second in the spring. Similarly, the Organic Chemistry I lecture and only only one or two instructors typically teach two associated laboratories each fall semester (no sections offered in the Spring). In General Biology I and II, on the other hand, while students have the same instructor for the lecture and laboratory sections, there are many lecture and laboratory sections each semester, taught by a variety of instructors.

Step 2: A random–coefficients model

In the second stage of modeling, we estimated a full Level-I model utilizing the student-level measures to predict the student's highest interval level grade attained for each course. All independent variables were left free to vary because the sample was representative of a period of time that the institution was still seeing change in its admissions and student body profile as it moved toward a more selective institution. The Level-I predictors were all centered on the group mean, i.e., calculated across observations for each sectional grouping.

The estimate of the overall section means (Level-II grand mean) for General Biology I, General Biology II, and Cell and Molecular Biology is 2.8 (B- range), 3.0 (B), and 2.36 (C+) respectively. Holding constant the sample size per section, the reliability of sectional mean grade reliability is 0.7 for General Biology I, 0.87 for General Biology II, and 0.77 for Cellular and Molecular Biology. Reliability close to 1.00 means that course's sectional mean attainment levels are very reliable across sections (Raudenbush and Bryk, 2002; Ethington, 1999). The estimates for the Level-I (between) and Level-II (within/random) effects can be seen in table 2.

Except for the student measures SAT Math and SAT Verbal in General Biology I, the majority of the variances of the slopes of all incorporated student measures are non-significant and do not vary across sections. The SAT Math and SAT Verbal variance across sections in General Biology I is most likely due to the fact that the sections were sampled during a period when the college was transitioning from a selective institution to a highly selective institution. In this model,

SAT Verbal and SAT Math may be a function of *ability* and interacting with the year the section was offered, thereby causing the significant parameter variance for these two Level-I predictors.

Table 2: Variance Explained by Student Level Measures

Random Coefficients Model	**General Biology I**	**General Biology II**	**Cell/Molecular Biology**
Proportion of Variance Explained in mean interval-level grade attainments levels *among* students within sections as a function of STUDENT-LEVEL MEASURES (between-section variance estimate serves as the bases for the calculation).	23.29%	39.13%	45.30%
Remaining Unexplained STUDENT-LEVEL variance	76.70%	60.86%	54.69%

The chi-square test on the between-section differences indicates that the average attained grade does indeed still vary across sections. Table 3 shows the remaining between section variance. The reader should also note that the decrease in variance from the Base Model is due to the addition of more parameters and equations defining the model.

Table 3: Within- and between-section variance

General Biology I *Random effects*	*Variance*	*DF*	*Chi-Square*
Within-section variance explained	0.584781		
Between-section variance	0.06164	13	42.01052***
General Biology II	*Variance*	*DF*	*Chi-Square*
Within-section variance explained	0.44764		
Between-section variance	0.09029	17	66.21558***
Cellular & Molecular Biology	*Variance*	*DF*	*Chi-Square*
Within-section variance explained	0.52104		
Between-section variance	0.08291	13	49.29406***

***p<.001, **p<.05

Step 3: A random–intercepts model

This final stage of the model includes both student-level and section-level variables. The student-level variables utilized in the prior random-coefficients model will remain the same with the exception that the residual coefficients for the related measures will be set to 0 so they do not non-randomly vary across sections (Raudenbush & Bryk, 2002; Ethington, 1997). Again, the rationale for this is that the majority of measures did not yield significant variance across sections. The two measures that did yield significance at Level II, SAT Verbal and SAT Math, also have their variances specified as 0 with no Level-II predictors because a Level-II variable was incorporated to account for the between section variance due to section academic ability by year. Because the chi square test indicated that the intercept *(mean grade attainment)* varied across sections, the mean is allowed to vary and is modeled with the four section-level variables: rank (adjunct or tenure-track), size, overall GPA *(majors and non-majors interval-level grade average)*, and ability *(SAT Combined Score Averages)* for the General Biology I model

only. Table 5 lists the remaining residual variances for the three courses after including the section-level measures.

Table 4: Random intercepts residual variances

General Biology I *Random effects*	*Variance*	*DF*	*Chi-Square*
Between-section variance explained	0.0006	40	28.35922
Within-section variance	0.61829		
General Biology II	*Variance*	*DF*	*Chi-Square*
Between-section variance explained	0.03149	17	27.07602**
Within-section variance	0.4254		
Cell & Molecular Biology	*Variance*	*DF*	*Chi-Square*
Between-section variance explained	0.00036	26	22.10637
Within-section variance	0.58011		

***p<.001, **p<.05

Of the three section-level measures, average class GPA (positive) was significant for all three courses and section enrollment (negative) and ability (positive) was significant for General Biology I only. Biology majors enrolled in sections where the average class GPA is higher tend to do better than majors who were enrolled in course sections with lower average GPAs. In an exploratory analysis undertaken prior to conducting the hierarchical modeling, average class GPA did vary by the adjunct/tenure track variable in a review of group differences. It did not vary in relationship to admit year. However, when the average section GPA was removed in exploratory modeling procedures, the adjunct/tenure-track variable did not explain significantly more variance. One might want to explore further how average section GPA functions as a covariate with faculty-status and admit year ability. In terms of understanding the overall proportion of variance explained by the section level measures, they accounted for almost 100% of the between section variance in General Biology I and Cell and Molecular Biology. In General Biology II, the chi square test indicated that the remaining unexplained variance was significant (Table 5).

Table 5: Random-intercepts - residual variances

Random coefficients model	**General Biology I**	**General Biology II**	**Cell/Molecular Biology**
Proportion of variance explained in mean interval-level grade attainments levels *between* sections as a function of SECTION-LEVEL MEASURES (between-section variance estimate serves as the bases for the calculation).	99.02%	65.12%	99.56%
Remaining unexplained SECTION-LEVEL variance	*0.09%*	*34.87%*	*0.04%*

Discussion and Limitations

First, the researchers wish to acknowledge that there are significant limitations on generalizability to other contexts because the data were collected at only one institution

for one department. Second, the research team explicitly acknowledges that there are limitations in the use of a course grade as the primary outcome. The researchers attempted to circumvent problems associated with the pass/fail variable and structure an interval-level variable that accounts for progress within the curriculum and does not ignore withdrawal patterns, incompletes, or repetition of the course. However, direct measures of learning such as cognitive and competency-based assessments utilized as pre/post assessments would enable the researchers to understand significantly more about what is being learned in the courses and to what degree these factors contribute to subsequent success in the classroom. The current curriculum transformation is pushing for advanced assessment measures that emanate from additional attention to formative assessment in the curriculum and precision in the operationalization of learning outcomes in courses.

Third, the researchers understand that hierarchical linear modeling requires a significant amount of data. The Biology curriculum was chosen as a test case in part because it has the largest sample of admitted majors for the School of Science. We were limited to a more recent time frame due to the culture of the institution and the evolution of student profiles over time. The researchers dealt with this primarily by employing a random-intercept and fixing slopes in the third model. Although we lost some degrees of freedom for sections in each course model because there were too few people in the section (essentially discounting the summer terms within the analysis), we were able to reach reasonable significance levels and have the data converge for three of the five courses.

Despite the issues noted in the limitations section, we believe the findings from our multilevel modeling analysis of sequence success prove useful for three of the core courses (General Biology I, General Biology II, and Cellular & Molecular Biology).

A second benefit of this analysis is that it enables us to parcel out the amount of variance explained by our student-level measures from the between section variance and get a clearer picture of what factors have an impact on curriculum sequence success. Third, the exploratory and conceptual work undertaken in order to prepare the model was also helpful in forcing us to think through our variable choices and the nested nature of the data. We believe it is important not to underestimate the import of this impact in theory building.

Future analyses will include, for the General Biology I model, control for section ability in the next stage of the analysis by fixing the Level-I effect to 0 and assigning a selectivity indicator to each section that is based on a combined SAT score at Level-II. In addition, because there is so little variance across sections for the student level measures, we will fix the effects of these independent variables to increase computational efficiency.

References

Andrade, S.J. (2001). Assessing the impact of curricular and instructional reform – A model for examining gateway courses. *AIR Professional File, 79*, pp. 1-15.

Banta, T. W. (1999). *Assessment Update: The First Ten Years*. Boulder, CO: National Center for Higher Education Management.

Coppola, B.P. (1995). Progress in practice: Using concepts from motivational and self-regulated learning research to improve chemistry instruction. *New Directions for Teaching and Learning, 63*, 87-96.

Ethington, C. A. (1997). A hierarchical linear modeling approach to studying college effects. In Smart, J.C. (Ed.), *Higher Education: Handbook of Theory and Research, 12*, 165-193.

Felder, R. M., Forrest, L., Baker-Ward, E. J., & Mohr, P. H. (1993). A longitudinal study of engineering student performance and retention. I. Success and failure in the introductory course. *Journal of Engineering Education, 82* (1), 15-21.

Felder, R. M., Felder, G. N., Mauney, M., Hamrin, C.E., & Dietz, E. J. (1995). A longitudinal study of engineering student performance and attitudes. III. Success and failure in the introductory course. *Journal of Engineering Education, 84*, 151-163.

Hershberger. L.D., & Plantholg, M. (1994). Assessing the Harvard consortium calculus at Illinois State University. *Focus on Calculus, 7*, 6-7.

Johnson, G. T., & Leonard, R. J. (1994). Evaluating curriculum changes in a computing service course. *Higher Education Research and Development, 13*, 189-198.

Johnson, K. (1995). Harvard calculus at Oklahoma State University. *American Mathematical Monthly, 102*(9), 794-797.

Lomen, D.O. (1992). Reform calculus: Quick answers to four questions. *Focus on Calculus1, 6*.

Magner, D.K. (1996). As enrollments in biology soar, colleges try new approaches. *Chronicle of Higher Education, 43*, A12-A13.

Pascarella, E.T. (1985). College environmental influences on learning and cognitive development: A critical review and synthesis. In J. Smart (Ed.), *Higher Education: Handbook of Theory and Research, (1)*. New York: Agathon Press.

Pascarella, E.T., & Terenzini, P.T. (1991). *How college affects students*. San Francisco: Jossey-Bass.

Patrick, W. J. (2001). Estimating first-year student attrition rates: An application of multilevel modeling using categorical variables. *Research in Higher Education, 42* (2), 151-170.

Penn, H.L. (1994). Comparison of test scores in Calculus I at the naval academy. *Focus on Calculus, 6*, 6-7.

Porter, S.R.., & Umbach, P. D. (2001). Analyzing faculty workload data using multilevel modeling. *Research in Higher Education, 42*(2), 171-196.

Ratay, G.M. (1992). Success with lean and lively calculus. *Focus on Calculus, 1*, 4.

Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA: Sage.

Tidmore, E. (1994). Comparison of calculus materials used at Baylor University. *Focus on Calculus 7,* 5-6.

Tinto, V. (1993). *Leaving college: Rethinking the causes and cures of student attrition*. Chicago, IL: University of Chicago Press.

Van Valkenburg, M. (1990). Second option: Turning off students: Our gatekeeper courses. *Engineering Education, 80*(6), 620.

Weidman, J. (1989) Undergraduate socialization: a conceptual approach. In J. Smart (Ed.), *Higher Education Handbook of Theory and Research, (5).* Edison, NJ: Agathon.

ASSESSING QUALITY AND EFFICIENCY OF INDIVIDUALIZED DEGREE PROGRAMS: CASE OF SUNY EMPIRE STATE COLLEGE

Mrinal Mugdh, Ph.D.
Director of Institutional Research
SUNY Empire State College

Introduction

The SUNY Empire State College was established in 1971 as a non-residential University College to test and experiment with new, flexible and individualized modes of learning, including new approaches to the delivery of services. Since its very inception, the college has adopted principles and models that support non-traditional adult learners who also form a vast majority of its enrolled students. It offers individualized degree programs which focus on experiential learning, personalized teaching-learning process and critical self-reflection. The college operates in a distributed learning environment and has 35 locations throughout the State of New York and four international locations. It offers individualized degree programs leading to Associate, Bachelor's and Master's degrees in 12 undergraduate areas of study (major) and five graduate areas of study. However, the innovative practices also present the challenges of measuring the quality and efficiency of individualized degree programs. The paper discusses how the college has successfully overcome this challenge by adopting a comprehensive assessment strategy that includes the periodic assessment of portfolios of conferred baccalaureate students across different centers and areas of study at the college.

The portfolio assessment initiative started in 1989 and has since been called the " area of study (AOS) review." Subsequent reviews were conducted in 1993, 1996 and 2000 reflecting the college's strong commitment to academic quality. The review is based on a comprehensive assessment of portfolios of a sample of students who received their bachelor's degree at the college. The portfolios include the student's degree program, program rationale essays, credit by evaluation reports, learning contracts and contract evaluations. The degree program rationale essays outline the individual educational and career objectives of the students that have guided the design of the degree plan. The credit by evaluation report includes all transcripts as well as supporting documents and evaluations on experiential learning2. The learning contract specifies what the student intends to study, how he or she will pursue each study, how much credit the student will earn upon successful completion of each study, and how and by whom the student will be evaluated. Contract evaluations are documents containing a brief description and objective evaluation of the learning achieved for a learning contract.

[2] The Council for Adult and Experiential Learning (CAEL) features Empire State College as a Best Practice Institution. Following CAEL's guidelines, the college recognizes award of credits for prior learning as an "exemplary practice" whereby "the institution defines and assesses the knowledge, skills and competencies acquired by adult learners both from the curriculum and from life/work experience in order to assign credit and confer degrees with rigor (2002)."

During the AOS review, these specific components of student portfolios are reviewed in relation to the college's academic policies, curricular guidelines, and assessment conventions and practices.

The review measures the effectiveness of the college degree program. It also measures differences in outcomes across different centers and areas of study. Further, it provides comparative data for longitudinal studies as well as an objective framework for continued improvement and planning at the college, center, and program levels.

Methodology

The present study is primarily based on data collected from the 2000 AOS review. For longitudinal analysis, this study also uses data from 16 questions that appeared in both the 2000 and the 1996 review.

The population for the study consisted of all students who received a bachelor's degree between April 1999 and March 2000. Given this population, 1,424 records, representing 1424 unique students, were extracted from the college's student information system for further sampling. From this pool, 350 portfolios representing all 12 areas of study at the undergraduate level were randomly selected for the review. The portfolios. The reviewers were provided with a review protocol with questions related to different dimensions of the students' degree programs including degree program rationale essay, concentration, breadth of study, learning contract, contract evaluation, assessment of prior learning, basic and college-level skill development, and overall level of student achievement.

Since each of the 350 portfolios in the sample was sent to two faculty reviewers, 700 reviews were expected. However, only 429 reviews were returned yielding an overall response rate of 61.3%. Of these 429 portfolios, 298 unique portfolios were reviewed by at least one reviewer and 128 of these 298 were reviewed by two reviewers each. At the 95% confidence level, the sampling error for the study is + 5%.

Given that the reviews were based on 298 unique student portfolios, it was decided to select only one review per portfolio for analyses and reporting. Since the review protocol was developed at the college, tests of reliability and validity were conducted to check the psychometric properties of the review protocol. To study the inter-rater reliability, instrument reliability, construct validity and factorial effect, inter-rater averages were used on items with Likert-type scale. The Chronbach alpha test was used to measure internal consistency of assessment items under different dimensions. Factor analyses with principal component extraction and direct obilim rotations were used to measure construct validity of the assessment instrument. For longitudinal analyses, a chi-square (χ^2) test was chosen as some of the variables in the study were dichotomous. Intra-class correlations using two-way random tests of convergence was used to measure inter-rater reliability. The general linear model was used to measure the factorial and interaction effects of areas of study and centers. All tests of significance were conducted at the 95% confidence level.

Results

Reliability and validity of assessment instruments is essential for "construction, selection, interpretation, and use of tests and other assessment instruments" (Gronlund 1993, p.159). Tests of internal consistency across different dimensions suggest that overall, the review protocol for AOS 2000 was fairly reliable. As shown in Table 1, on seven out of eight dimensions, the chronbach alpha score ranged between 0.63 and 0.92. According to Nunnally (1978), reliability coefficients greater than .70 are standard for adequate reliability of questionnaires and protocols. The items on contract evaluation yielded a poor reliability score of .33 only. Further analysis revealed that the low score was caused by one of the four items on which the ratings were inconsistent. After removing one contentious item, the reliability on this dimension increased to 0.66.

Table 1
Instrument Reliability/Internal Consistency Across Dimensions

Dimensions	Number of Items	Coefficient Alpha
Degree Program Rationale	6	0.87
Concentration	5	0.63
Breadth of Study	4	0.77
Effectiveness of Learning Contracts	6	0.92
Contract Evaluations[a]	4	0.33
Skills/Competencies Expected on Student's Record	11	0.82
Skills/Competencies Demonstrated on Student's Record	11	0.77
Overall Assessment: Level of Achievement	5	0.92

[a]After removing one of the four items from analysis, the reliability on this dimension increased to 0.66

An intra-class correlation suggested low inter-rater reliability on most of the items under all dimensions except the degree program rationale. Although the inter-rater reliability was low on these items, in most cases, ratings were contiguous. On a five-point scale, where 1= "definitely yes," 2= "probably yes," 3= "undecided," 4= "probably no," and 5= "definitely no," most of the ratings were between "definitely yes" and "probably yes." This suggests that the differences in ratings were reflective of minor differences between the judges rating scales and not in the nature of the judgment itself. In most of the cases, both the raters had a favorable perception of the quality of items that were reviewed. Nevertheless, to reduce variance between the raters, the mean of the two ratings were calculated for all analyses in this study.

Results from factor analyses established the overall construct validity of the survey instrument. They are summarized in Table 2. The factor analysis suggested that 62% of the variation was explained by only five factors although the test items addressed six major dimensions. The results revealed that items under breadth of study were not

one-dimensional as they loaded on both degree program rationale and concentration items. This also explained why the number of factors was one less than the total number of dimensions.

Table 2
Construct Validity

Items	Factor 1 DPR/ BOS	Factor 2 LC	Factor 3 LOA	Factor 4 CE	Factor 5 CONC
Explains student's goals	0.81				
Demonstrates breadth of study	0.74				
Justification for academic choices	0.72				
Meets academic expectations	0.71				
Broader view of bachelor's education	0.58				
Rationale discusses concentration	0.52				0.42
Evidence of liberal studies	0.45				0.30
Breadth in the general learning	0.45				0.34
Breadth in the overall program	0.54				0.31
Breadth in the concentration	0.13				0.77
Learning objectives are explicit		0.95			
Learning activities are clear		0.93			
Criteria for evaluation are clear		0.92			
Methods of evaluation are clear		0.88			
Amount of credit is appropriate		0.50		0.36	
Level of credit is appropriate		0.38		0.48	
Theoretical concepts in concentration			0.85		
Basic facts & specific knowledge			0.82		
Overall quality of learning			0.81		
Major methods of inquiry			0.77		
Critical analysis/evaluation/synthesis			0.69		
Evaluation criteria specified				0.75	
Work marked as intro./advanced				0.72	
Student met expectations				0.61	
Too much or too little credit awarded				-0.52	
Conforms to general AOS guidelines					0.81
Concentration is integrated/coherent					0.71
Topics of study are current					0.49
Conforms to specific AOS guidelines	0.42				0.37
Lays foundation for advanced study					0.35
Evidence of progression	0.26			0.44	0.31

Of the 16 comparable indicators that received ratings in both the 1996 and 2000 AOS reviews, 15 showed improvements. A chi-square test confirmed that improvement on nine of the 16 items were statistically significant suggesting the college's overall success in improving the quality of its degree programs.

The multivariate tests using the general linear model found statistically significant differences in the ratings across different areas of study. As shown in Table 3, the test did not find any statistically significant differences in the ratings across different college centers. Further, the test did not detect any statistically significant interaction effect between areas of study and individual centers.

Table 3
Multivariate Tests

Effect	Test	Value	F	Hypothesis df	Error df	Sig.
AOS	Pillai's Trace	1.0	2.3	80	1312	0.000
	Wilks' Lambda	0.3	2.5	80	1004	0.000
	Hotelling's Trace	1.3	2.6	80	1242	0.000
CENTER	Pillai's Trace	0.5	1.1	80	1312	0.241
	Wilks' Lambda	0.6	1.1	80	1004	0.240
	Hotelling's Trace	0.6	1.1	80	1242	0.239
AOS * CENTER	Pillai's Trace	2.2	0.9	528	1312	0.824
	Wilks' Lambda	0.1	0.9	528	1267	0.845
	Hotelling's Trace	3.1	0.9	528	1242	0.866

Further analyses, using tests of between-subjects effects in two-way ANOVA showed statistically significant differences across areas of study at dimensional levels on items related to concentration and degree program rationale. The test results are presented in Table 4. Across the centers, statistically significant differences were observed on items related to degree program rationale and learning contracts. Once again, the two-way ANOVA did not show any interaction between centers and areas of study.

Table 4 Tests of Between-Subjects Effects

Source	Dependent Variable	SS	df	MS	F	Sig.
AOS	Degree Program Rationale	21.8	10.0	2.18	3.2	0.001
	Concentration	36.8	10.0	3.68	7.0	0.000
	Breadth of Study	5.9	10.0	0.59	1.1	0.349
	Learning Contract	3.8	10.0	0.38	1.0	0.414
	Contract Evaluation	6.3	10.0	0.63	2.2	0.019
	Skill Expected	10.5	10.0	1.05	3.3	0.001
	Skill Demonstrated	10.3	10.0	1.03	4.5	0.000
	Level of Achievement	2.5	10.0	0.25	1.0	0.449
CENTER	Degree Program Rationale	16.3	10.0	1.63	2.4	0.011
	Concentration	0.9	10.0	0.09	0.2	0.998
	Breadth of Study	3.5	10.0	0.35	0.7	0.765
	Learning Contract	7.3	10.0	0.73	2.0	0.038
	Contract Evaluation	2.9	10.0	0.29	1.0	0.419
	Skill Expected	4.6	10.0	0.46	1.4	0.169
	Skill Demonstrated	3.4	10.0	0.34	1.5	0.150
	Level of Achievement	2.0	10.0	0.20	0.8	0.623
AOS * CENTER	Degree Program Rationale	38.5	66.0	0.58	0.9	0.762
	Concentration	25.0	66.0	0.38	0.7	0.937
	Breadth of Study	34.3	66.0	0.52	1.0	0.521
	Learning Contract	23.2	66.0	0.35	1.0	0.567
	Contract Evaluation	16.2	66.0	0.25	0.9	0.736
	Skill Expected	22.1	66.0	0.33	1.0	0.412
	Skill Demonstrated	15.6	66.0	0.24	1.0	0.418
	Level of Achievement	17.5	66.0	0.27	1.1	0.364

Among the different areas of study, statistically significant differences were reported on questions related to quantitative and computer skills. Compared with other areas of study, portfolios from Human Development, and Social Theory, Social Structure and Change showed both a lower level of expectation to demonstrate computer skills and a lower actual demonstration of these competencies. Portfolios from Cultural Studies, Historical Studies, and Social Theory, Social Structure and Change showed both a lower level of expectation to demonstrate quantitative skills and a lower actual demonstration of competency in quantitative skills. On all other items concerning level of achievement no statistically significant differences were reported across centers or areas of study. It is interesting to note that although differences exist in degree program, contract evaluation, and quantitative and computer skills at the area of study level, they do not impact the overall level of achievement by students in these areas of study. In other words, there is no statistically significant difference in the level of student achievement across centers of different areas of study.

Item ratings on all dimensions underscore the high quality and efficiency of student portfolios. The review found that in almost 88% of the cases, the rationale explained how the degree program addressed students' goals. This finding supports the

college's emphasis on individualized degree programs that address the goals of adult learners.

The review also received high ratings on questions related to appropriate concentration titles, integration and coherence, progression to advanced level study and breadth within the concentration. More than three-fourths of the reviewers found the concentration to be integrated and coherent (87.4%) and almost all of them found evidence to conclude that the topics of study in the student's concentration were sufficiently current (92.5%). Overall, 83% of the reviewers concluded that the concentration conforms to the current general registered area of study guidelines. Nearly 83% of the reviewers affirmed that there was adequate breadth in the overall degree program (concentration and general learning) for the degree designation.

The review also confirmed the fair and objective standards adopted by the college for evaluation of experiential credits. Only 10.7% of the reviewers found instances of too much or too little credit being awarded in individualized credit by evaluation. More than two thirds of reviewers concluded that the individualized evaluation of prior learning conform to college expectations by specifying the methods of evaluation, describing the nature of students' learning (not just students' experience), providing a clear basis if credit is recommended at the advanced level, and recommending a title that matches the content. Reviewers did not find any overlap between credit for prior learning and contract learning in the portfolios.

Nine out of 10 reviewers concluded that learning objectives were explicitly defined and clearly specified in the learning contracts. Almost all reviewers concluded that the amount of credit in the learning contract was appropriate to the learning activities and only 4.5% of the reviewers found definite or probable instances of too much or too little credit awarded in contract evaluations, in relation to the learning activities and expectations for the study.

Most of the reviewers agreed that the discussion of actual student performance provided clear evidence that the student met expectations for the designated level of study (86.8%). Overall, the reviewers found that students' understanding of the theoretical concepts in the field of concentration was between good and outstanding.

Discussion

Assessment plan at an institution should be guided by its mission statement (Palomba & Banta, 1999). The primary mission of Empire State College is to serve adult learners in innovative ways. As described in its mission statement, "the college's programs ensure educational excellence through a unique combination of individual student planning and advisement supported by networked educational resources, permitting its students, primarily adults, flexibility in time, place, pace and content of study." The results from the area of study review strongly suggest that the college has successfully pursued its mission and has met the challenge of ensuring educational excellence while providing flexible programs and services suited to the needs of adult

learners. Most of the college's achievements can be attributed to effective principles and practices that present opportunities for adult learners to engage in a collaborative learning experience that is adult centered, emphasizes educational quality, and helps adults to meet their goals of personal and professional development. These practices are also related to a comprehensive, coherent and methodologically sound assessment strategy that includes exercises like the area of study review.

Assessment exercises provide an opportunity to assess educational programs as well as an opportunity to fine tune the assessment methodology. The results from factor analyses and reliability studies suggest that although the review protocol was found to be broadly reliable and valid, it needs readjustment to increase construct validity of items under the "concentration" and "breadth dimensions."

Assessment of key skills remains poor if it involves "poorly standardized and idiosyncratic assessments carried out by individual assessors, where judgments may not relate to those of other assessors" (Murphy, 2001, p.13). Results from the inter-rater reliability analyses suggest development of consistent protocols for assessors with more extensive guidelines/rubrics that would enhance inter-rater agreement. Another way to eliminate inter-rater disagreement is to ask the raters to have consensus on the ratings. Such an approach is adopted by the National Association of Elementary School Principals for assessing the administrators (Coleman & Adams, 1999). However, such an approach may not be practical in a setting where reviewers have to deal with lengthy portfolios and rate hundreds of items. To address this problem, assessment reviews should limit "the observable number of dimensions of the performance to a reasonable number" and provide "clear, definite criteria for judging the product" (Gronlund, 1993, p. 129).

Portfolio assessment initiatives not only assess the quality of student learning but also lead to new learning outcomes among adult learners (Van Kleef, 2000; Brown, 2002). Palomba and Banta assert that portfolio development processes engage students in the "active process of learning and prompt conversation" (1999, p.146). The degree program rationale essays from student portfolios validate these assertions. Students at Empire State College submit the program rationale essays as a part of the educational planning process. These essays are included in their portfolios as evidence of student work. Almost half of the reviewers evaluating these essays confirmed that the student had a broader view of baccalaureate education as a result of the educational planning process at the college.

Portfolio review also provides an opportunity to measure quality at the program level. Differences in critical indicators of expected and demonstrated outcomes on basic skills across different areas of study provide more specific information on quality problems at a micro level. By identifying these program level inconsistencies, the college can work on infusing these skills in both breadth and concentration areas to maintain consistent quality across all areas of study.

The empirically derived findings from the 2000 area of study review not only provide a strong and objective endorsement of the superior quality of its academic program, they also lay the groundwork for making continuous quality improvement which remain the core focus of its assessment and planning strategy.

References

Brown, J. O. (2002). Know thyself: The impact of portfolio development on adult learning. *Adult Education Quarterly*, *52*(3), 228-245.

Coleman, D.G., & Adams, R.C. (1999). Establishing construct validity and reliability for the NAESP professional development inventory: Simplifying assessment center techniques. *Journal of Personnel Evaluation in Education*, *13*(1), 24-45.

Council on Adult and Experiential Learning. (n.d.). Serving adult learners in higher education: Principles of effectiveness (Executive Summary). *Retrieved July 1, 2003, from http://www.cael.org*

Gronlund, N.E. (1993). *How to make achievement tests and assessment*s (5th ed.). Boston: Allyn and Bacon.

Nunally, J.C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

Palomba, C.A., & Banta, T.W. (1999). *Assessment essentials planning, implementing and improving assessment in higher education*. San Francisco: Jossey-Bass.

R. Murphy, (2001). A briefing on key skills in higher education. Learning and Teaching Support Network Assessment Series No.5. Retrieved October 15, 2003, from http://www.materials.ac.uk/resources/browse.asp.

Van Cleef, J. (2000). Report on a slice of the iceberg: A cross Canada study of prior learning assessment and recognition. *Council for Adult and Experiential Learning Forum*, *23* (2), 24-26.

WHAT DO STUDENTS EXPECT WHEN IT COMES TO THE EVALUATION OF THEIR WORK?

Mitchell S. Nesler
Assistant Vice President for Academic Affairs
For Program Planning and Outcomes Assessment
Office of Academic Affairs
Empire State College
State University of New York

Abstract

A survey of Empire State College enrolled students was developed to determine students' opinions about student evaluation and grading. The survey was developed as the college's academic policy committee considered changing the institution's long-standing policy of providing narrative evaluations of student performance instead of letter grades. A total of 416 students responded to a mailed paper and pencil survey, yielding a 52.6% response rate. Results indicated that about 85% of students favored receiving both narrative evaluations and letter grades.

Introduction

Empire State College, of the State University of New York, was designed to meet the educational needs of adult students. Founded in 1971, the college offers degree programs in the arts and sciences through numerous modes of learning: independent, mentored study, group studies, short-term residences, and multiple forms of distance learning. For most of the college's history, narrative evaluations were furnished to students rather than grades. It was believed that this approach provided greater depth of feedback to students and was consistent with the student-centered educational philosophy of the college. About a decade ago, the Office of Academic Affairs mandated that students be given letter grades at their request, in addition to narrative evaluations. This mandate was largely in response to students' needs, as some employers and other external audiences required documentation of student learning outcomes in a standardized way.

Narrative evaluations have generally met Empire State College students' needs for documentation of their academic work. However, certain employers, government agencies, graduate school programs, and scholarship applications do not accept narrative evaluations of student work and require a grade point average (GPA). In instances where students need them, the college has engaged in the practice of assigning grades retroactively on behalf of students. The academic soundness of this practice is questionable at best. The passage of time and individual differences in documenting the caliber of student work make the reliability and validity of retroactively assigned grades uncertain. As there was a sense within the college that assignment of student grades was increasing and given the inherit weakness of the practice of retroactive grading, the academic leadership of the college proposed a student evaluation policy that included

issuing grades to students by default. The policy included safeguards so that if an individual student did not want to be given grades he or she would not have to receive them.

A review of the college's database suggests that the practice of writing narrative evaluations varied widely among faculty. Some faculty provide rich descriptions of student learning and course activities, others provide detailed descriptions of the learning content with a short statement containing a credit recommendation for the student. It is likely that in these latter instances, feedback to the student occurred through less formal means, such as during face-to-face meetings or through comments on assignments that occur throughout a study.

As the reaction by faculty and staff within the college community was mixed with respect to the assignment of grades by default to students, the Academic Policy and Learning Programs Committee requested that feedback be solicited from the stakeholders most affected by the proposed change – Empire State College enrolled students. A student survey was administered between April and May 2003 to solicit student feedback on evaluation and grading at Empire State College.

Method

Subjects and Procedure

A random sample of undergraduate students was selected to participate in this research. Eight hundred students were solicited for participation in a survey of student evaluation and grading via mail. Students were sent a letter from the college's Provost/Vice President for Academic Affairs announcing the arrival of the survey, a letter with the actual survey, and one follow-up mailing at a timed interval (Dillman, 2000). All surveys were printed with a bar code identifying the individual student so that no student's responses were included in the results twice. A total of 9 surveys were returned as undeliverable, reducing the sample of students contacted to 791. A total of 416 students returned the survey, for a response rate of 52.6%. Response rates in the 25% - 33% range are fairly typical for educational survey research (Goodwin & Stevens, 1993; McCabe & Trevino, 1993), but it is possible to improve response rates by using established survey research techniques (Dillman, 1978, 2000; Mangione, 1995; Nesler, Sopczyk, Cummings, & Fortunato, 1998; Nesler, Hanner, Melburg, & McGowan, 2001).

Survey Development

The survey instrument was developed by the author in collaboration with other Empire State College staff members, based on issues raised at various college meetings and discussions. The survey consisted of a series of items rated on a 5-point Likert-type scale indicating agreement or disagreement with the college's move toward the use of grades in addition to a narrative evaluation. Students were also given space to provide written comments. The survey was reviewed by the Academic Policy and Learning Programs Committee, who provided feedback and suggestions for improvements to the

language and types of questions posed. After evaluation of the feedback from this group, the survey was then pilot tested on a small group of students and alumni.

Pilot Test

Five Empire State College students and one graduate were contacted to participate in the pilot study. After receiving the survey, either in person or by fax, the pilot test subjects were asked to respond and were then interviewed by the author. The pilot test subjects' responses were reviewed prior to the interview, so that the pattern of individual responses could be explored. The letter accompanying the survey was altered slightly based on feedback received during the first interview, as was some of the language on the survey itself. Subsequent pilot test subjects consistently found all of the items on the survey to be clear, and had no difficulties interpreting the items or expressing their opinions on the survey.

Results

Demographics

Since surveys were bar coded to identify individual students, it was possible to examine the demographic characteristics of the respondents. Sixty-one percent of the respondents were women, and the average age of the respondents was 38.7 (standard deviation = 9.8) with a range between 17.9 and 72.8 years old. In terms of ethnicity, 77.9% of the respondents were White, Non-Hispanic, 12.3% were Black, Non-Hispanic, 3.8% were Hispanic, 1.9% was Asian or Pacific Islander, and 0.5% was American Indian/Alaska Native. Ethnicity data was not available for 3.8% of the respondents.

Analysis of the responses to the demographic questions on the survey revealed that 101 respondents indicated that in terms of their position in their program, they were in their first enrollment (24.3%), another 239 respondents indicated they were mid-program (57.5%), and another 76 indicated they were in their final enrollment (18.3%). There was no missing data on this item. Table 1 reveals the self-reported number of credits the respondents had earned while at Empire State College. The majority of respondents indicated that they had received fewer then 20 credits while at ESC.

Table 1 Self-Reported Number of Credits Earned at ESC.

No. of credits	Frequency	Percent	Valid Percent
Fewer than 10	114	27.4	27.7
11-20 crs	105	25.2	25.5
21-35 crs	82	19.7	20.0
36-50 crs	52	12.5	12.7
51-75 crs	34	8.2	8.3
76 + crs	24	5.8	5.8
Total	411	98.8	100.0
Did not respond	5	1.2	--
Valid Total	416	100.0	--

Note: "Valid Percent" includes only those who responded to the question.

Sample Representativeness

While the response rate for this survey compared favorably to what is typically found in education surveys, it is important to know if bias exists in any sample. This type of check provides greater confidence in the data. It is not possible to know if bias in the opinions of students was present, but it is possible to examine if survey respondents were biased in terms of demographic information. A series of analyses were conducted to determine if the respondents differed significantly from the total sample surveyed.

In terms of age, survey respondents were significantly older than the non-respondents. Respondents were 38.7 years old on average, whereas non-respondents averaged 32.4 years old. A T-test of sample means suggests that this difference in average age was statistically significant ($p < .0001$). However, it should be noted that age did not correlate with survey responses on 12 of the 15 questions on evaluation and grading. In other words, this variable did not seem to influence students' perceptions about grading and evaluation.

In terms of ethnicity, survey respondents were less diverse than the potential pool of respondents. Among the survey respondents, 77.9% belonged to the White, Non-Hispanic category. Among the non-respondents only 58.9% belonged to the White, Non-Hispanic category. In terms of gender, 61.5% of the survey respondents were female, whereas, the percentage of female students in the sample was 51.8%.

Overall, the results of these analyses indicated that there was some level of bias in the respondent pool based on demographics. It is difficult to know precisely how this bias may have influenced the survey results, as opinions about grading may or may not have been influenced by these variables. A chi-square (χ^2) test was conducted to see if the differences in ratings were influenced by age, ethnicity or gender of the respondents. The chi-square (χ^2) tests confirmed that there was no relationship between age and student ratings on all questions related to evaluation and grading. The tests also confirmed that ethnicity was not a factor in influencing student ratings on 14 of the 15 survey questions on evaluation and grading. However, the chi-square (χ^2) tests did suggest a relationship between gender and student ratings on 5 of the 15 survey questions on evaluation and grading. Four of these five relationships were statistically significant at $p < .05$ level, whereas one relationship was statistically significant at $p < .01$ level. Women generally indicated a greater desire for both letter grades and narrative evaluations than did men.

In general, it appears that there was some bias in the respondent pool. However, the impact of this bias on the data appears to be minimal. Women were over represented and generally were more favorable to receiving both letter grades and narrative evaluations.

Factor analysis and scale reliability

A principle components analysis was conducted to determine the psychometric properties of the items developed for this research. A two-factor solution was supported,

generally indicating a single strong factor accounting for all of the items on the scale except two. This factor accounted for 45.3% of the item variance. A second factor accounted for an additional 8.4% of the variance and consisted of two items – items 10 and 12:

- Narrative evaluations give me important information about my academic development and learning.
- The use of narrative evaluations was an important factor in my decision to enroll at ESC.

Thus, students generally responded to most of the Likert-type questions in a consistent manner, suggesting that on the whole, they were able to indicate their preference with respect to evaluation consistently.

The reliability estimate for the scale using Cronbach's alpha, including all 15 items was .898. The reliability estimate for the scale excluding items 10 and 12 was .913. Generally, values of .70 or higher indicate a reliable scale (Nunnally, 1978).

Main Analysis

The number of respondents and percentage of respondents indicating their level of agreement with each item on a 5-point Likert-type scale is displayed in Table 2. This table shows that the majority of respondents were able to respond to the questions in the direction they intended, suggesting that acquiesce was not a response bias on this survey. Generally, the majority of respondents indicated that they were in favor of receiving narrative evaluations and that they also felt that grades would add value to their Empire State College experience. Means, reverse-keyed means, and standard deviations for each of the items are also displayed in Table 2. Please note that the means of the reverse-keyed items are scored in the reverse direction so that agreement with all items can be examined using a comparable scale.

As can be seen from this table, a large percentage of students indicated agreement with items that favored the use of the letter grades in addition to narrative evaluations, and disagreement with items indicating negative opinions about letter grades. Item means generally indicate strong agreement in favor of use of both letter grades and narrative evaluations. The highest mean ratings (4.49), indicating the greatest level of agreement, were for the following items:

- I am in favor of ESC providing letter grades regularly in addition to narrative evaluations.
- Letter grades serve as an additional source of information about my performance.

Open-ended comments

Students were given the opportunity to provide written comments in response to three open-ended questions pertaining to student evaluation and grading as well as their own experiences while enrolled at Empire State College. Each response was transcribed

by an Institutional Research staff member and subsequently coded based on recurrent themes. More than half of the sample consistently provided feedback on the first two issues. Students were slightly less likely to elaborate on their ESC experience.

The rationale behind the coding scheme is two-fold. A general coding scheme was developed to assess the overall tone of the response; secondary coding was used to elicit a higher level of detail. For example, a primary code would determine whether a student was in favor or against the proposed grading policy change. The secondary code would provide a rationale, if one was provided.

Additional thoughts on evaluation and grading

Nearly sixty percent of the sample provided responses to the first extended response question where students were asked: "Please share with us any additional thoughts you have about student evaluation at Empire State College." Comments revealed that students generally support the proposed change to the existing grading policy (60.3%). Those in favor were likely to speak to the value of having both letter grades and narrative evaluations, particularly when reporting to external audiences.

> "Receiving a letter grade would make transcripts and tuition reimbursement much easier. The narrative evaluation is great. However, a letter grade means much more to outsiders (other schools, reimbursement)."

> "Combining letter grades with narrative evaluation will give students & graduate committees a good view of the student's achievement & ability. Students that later changed their minds about receiving a letter find it difficult to back track their instructors. This change will help the students in future school decisions."

> "I have always valued the narrative and also wished I would also receive a letter grade. I have not always been able to facilitate getting one because I didn't think to identify the need and am now facing grad school applications with a little anxiousness about not having a traditional transcript GPA. I would focus just as much attention on narrative if I received both."

Letter grades also serve students personally by providing a universal measure by which they can compare themselves to others, at times improving self-esteem. Students also find that the narrative evaluation is of personal benefit to them, enhancing the learning process, reinforcing what was learned and identifying strengths and areas for improvement. Sample comments appear below.

> "Receiving a letter grade increases my self-esteem, particularly since I am an older student and was uncertain of my capabilities in returning to

school. I can take pride in telling my 82-year-old father I got an "A." I can't remember everything that was written in a narrative evaluation."

"The evaluations received at the end of each course have given me greater insight into my progress. I have enjoyed and valued the constructive comments. Also, I have requested grades to help me understand how I compare within standardized measuring."

There were nearly equal numbers of students whose comments did not elicit a definitive opinion (13.0%), those who expressed an interest in keeping the existing policy (13.4%) and those responses where were coded as either "miscellaneous" or "neutral." Among the comments that didn't elicit an opinion, it seemed that there was concern that letter grades would replace or adversely affect the quality of narrative evaluation, as if one method took precedent over another, or perhaps the proposed change was not clearly understood.

"If the policy is changed, ESC should endeavor to ensure the mentors continue to provide a thorough narrative evaluation for each study. I would not want to see mentors use letter grades as an excuse for less thorough evaluations of a students work."

"Meeting with my mentor, regularly, serves as a forum for providing feedback regarding my performance. If letter grades were to completely replace narratives, I would not be concerned if I could continue to receive verbal feedback from my mentor."

Those who were in favor of keeping the existing policy suggested that having letter grades would be a source of intimidation and pressure for adult students returning to college, and act a as a deterrent. Others explained that letter grades don't hold the same value for everyone.

"I really feel ESC should continue with its current evaluation policy and allow grading to be optional. I think letter grades will be a deterrent to the adult learner wanting to return to college. The narrative evaluations are what make ESC a unique experience. A letter grade could be a threat to anyone insecure and wanting to give a college program a try."

"I like it. I don't want the pressure of feeling as though I have to get an "A." I can concentrate on learning as much as I can in the course and not be concerned with the grade."

"Student evaluations are great. There is no need for grades unless students plan on transferring to a different college."

The open-ended comments from students were a very strong indicator of the level of support there was for the change in policy.

Table 2. Number of Respondents (N), Percent of Responses in Each Category, Item Means, and Standard Deviations.

Survey Item	***N***	Item Mean	***Std. Dev.***
Letter grades provide valuable feedback in addition to the narrative evaluation.	415	4.33	1.05
Letter grades will cause me to ignore the narrative evaluation and focus on getting good grades.*	416	4.19*	1.15
Letter grades serve as an additional source of information about my performance.	416	4.49	.88
If my mentors were to issue letter grades regularly, I would take fewer risks with my education (i.e., I would be less likely to try certain studies).*	416	3.94*	1.30
ESC should issue letter grades regularly to serve students who might want to apply to graduate schools in the future.	416	4.37	1.04
Letter grades do not add any value to the educational process.*	416	4.14*	1.20
ESC should issue letter grades regularly for greater ease of tuition reimbursement from employers.	416	4.16	1.11
If my mentors were to issue letter grades regularly, I would feel as if I were receiving less support from them.*	416	4.35*	1.03
Receiving letter grades regularly will not diminish the value of narrative evaluations.	416	4.22	1.24
The use of narrative evaluations was an important factor in my decision to enroll at ESC.*	416	3.57*	1.47
I would hesitate to tackle difficult subjects if letter grades were issued in addition to narrative evaluations.*	416	4.08*	1.25
Narrative evaluations give me important information about my academic development and learning.	416	4.43	.88
I am in favor of ESC providing letter grades regularly in addition to narrative evaluations.	416	4.49	1.00
Knowing that I will receive a letter grade at the end of a study will diminish the learning experience for me.*	416	4.46*	.99
ESC should not change its current evaluation policy allowing for letter grades upon student request.*	416	3.73*	1.43

Note: Items were rated on a 5-point Likert-type scale. Reverse-keyed means are denoted with an asterisk (*).

Discussion

The results of this survey indicated that Empire State College students strongly favor receiving narrative evaluations from their mentors. Narratives are seen as providing rich, detailed information about student progress and learning. Students also indicated a very strong preference for letter grades in addition to narrative evaluations. Students indicated that grades are of value for both purposes of receiving feedback about their performance and interacting with audiences external to the college. A relatively small minority of students suggested that they would not like to receive letter grades on a regular basis. Some indicated that grades have had a negative impact on them in the past and that they enrolled at Empire State College because of its use of narrative evaluations. In response to the item about Empire State College providing letter grades regularly in addition to narrative evaluations, 6% of the sample indicated some level of disagreement, about 9% indicated a neutral position, and about 85% indicated some level of agreement. Written comments also generally followed a pattern of about 10 – 15% opposition to the regular issuing of letter grades. Students were consistent in their message with respect to grading on this survey.

The information gathered from this survey was cited and discussed as the academic policy making body of the college considered the grading policy change and its potential impact on students. Some members of the college faculty were strongly opposed to the change in policy. Given the overwhelming support from students for the change, the policy to give letter grades by default was passed. The research described here provides an example of how institutional research can play a role in critical policy discussions on campus.

References

Dillman, D. A. (1978). *Mail and telephone surveys: The total design method.* New York: John Wiley & Sons.

Dillman, D. A. (2000). *Mail and Internet surveys: The tailored design method* (2nd ed.). New York: John Wiley & Sons.

Goodwin, L. D., & Stevens, E. A. (1993). The influence of gender on university faculty members' perceptions of good teaching. *Journal of Higher Education, 64*, 167-185.

McCabe, D. L., & Trevino, L. K. (1993). Academic dishonesty: Honor codes and other contextual influences. *Journal of Higher Education, 64*, 522-538.

Mangione, T. W. (1995). *Mail surveys: Improving the quality. Applied Social Research Methods Series, 40.* Thousand Oaks, CA: Sage.

Nesler, M. S., Hanner, M. B., Melburg, V., & McGowan, S. (2001). Professional socialization of baccalaureate nursing students: Can students in distance nursing programs become socialized? *Journal of Nursing Education, 40* (7), 293-302.

Nesler, M. S., Sopczyk, D. L., Cummings, K. M., & Fortunato, V. J. (1998). Nursing informatics needs assessment: Are distance programs needed? *Nurse Educator, 23*, 25-29.

Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

THE INTERNATIONAL UNDERGRADUATE STUDENT EXPERIENCE

Dawn Geronimo Terkla
Executive Director, Institutional Research
Heather S. Roscoe
Research Analyst
Jane Etish-Andrews
Director, International Center

Tufts University

There is a substantive body of literature that addresses issues surrounding the success of international students at American Universities. International students can experience a number of problems and a great deal of stress when attending U.S. institutions, particularly in academic situations and developing new social networks (Wan, Chapman, & Biggs, 1992; Al-Sharideh & Goe, 1998). Wan et al. (1992) question whether institutions in the United States effectively assist their international students in making the cross-cultural adjustment. They found that students whose home educational system was perceived as unlike that of the U.S. experienced more stress than students whose home educational system was perceived as more similar. Having good English language skills seems to play a role in lessening the stress felt by international students (Wan et al., 1992) and, as might be expected, comprehension of lectures can be especially difficult for students from non-English speaking countries (Tompson & Tompson, 1996). Another source of stress is the adjustment to a different set of values and expectations, such as American students addressing their professors in a less formal manner and sometimes even speaking without having been called on, which could be improper in the international students' home country (Tompson & Tompson, 1996). Having a strong social support network seems to improve international students' abilities to cope with this stressful situation (Wan et al., 1992). Students see this as critical, but they tend to find developing those networks especially difficult (Tompson & Tompson, 1996). Al-Sharideh and Goe (1998) found that the number of strong network bonds that international students had with other students from their culture or similar cultures was positively related to a high self-esteem, but a negative effect was seen once the number of bonds reached 32. In addition, "the establishment of strong ties with Americans has an independent, positive effect in promoting (an international) student's self-esteem, regardless of the number of strong ties developed with other coculturals," and that developing bonds with Americans is beneficial for the international student's adjustment (Al-Sharideh & Goe, 1998). Additionally, "what students experience may actually stem from their attempts to adjust to university life using strategies that would be effective in their own country but ineffective in the United States" (Tompson & Tompson, 1996). Furthermore, international students from different cultures/countries experience different problems, and students from cultures that are dissimilar to American culture tend to experience more problems than do students from cultures that are more similar, which

may make it even more difficult to address all international students' needs (Sheehan & Pearson, 1995).

The primary purpose of this paper is to describe the results of a yearlong effort devoted to obtaining information in order to better understand the experiences of international undergraduates[3] who attend Tufts University. Members of the International Board of Overseers, an advisory body that concentrates on issues regarding members of the international community, commissioned this research. The board was particularly interested in learning more about the international undergraduate population. Specifically, they were interested in determining whether the anecdotal stories they had heard were representative of the total population.

Method

The fall 2001 semester was dedicated to gathering information that would inform the development of a survey instrument. Members of the board interviewed several international students. The findings from these interviews helped determine areas in which the board would like additional information. As a result, an instrument was developed and pilot tested in mid-January of 2002. Based on information obtained from a sample of international undergraduates who participated in the pilot survey, a web-based instrument was designed. In February 2002, 736 international students were encouraged to participate in this web-based survey. The purpose of the survey was to elicit international students' opinions about their undergraduate experience at Tufts in order to facilitate improvements. Undergraduates were asked a variety of questions. Specifically, they were queried about a variety of issues such as: 1) their overall satisfaction with the University, 2) their reasons for studying in the United States, 3) difficulties they had encountered since matriculation, 4) interactions that they had experienced with faculty and other students – both international and domestic, 5) their post-baccalaureate plans, and 6) their concerns regarding financing their undergraduate education.

One hundred fifteen students responded, thus yielding a 15.6% response rate.[4] The majority of respondents were either first or second year students. Slightly over 38 percent of the respondents were juniors, seniors or fifth-year undergraduates. Women responded at a slightly higher rate than their male counterparts (60% vs. 40%). Slightly more than 40 percent reported that they were rooming exclusively with American students, while 30 percent indicated that all of their roommates were international students. For 70 percent of the respondents, English was not their first language. In fact, 88 percent reported that they were fluent in two or more languages. Approximately 58

[3] For purposes of this study, international students included all foreign citizens, students with dual citizenship, permanent residents, and those United States citizens who had non-U.S. permanent addresses.

[4] In 2002 there were 344 foreign (non-U.S. citizens) undergraduate students. Of these 54.3% were female and 45.6% were male. The countries with the highest numbers of students were: Canada 42, Korea 26, Turkey 23, Japan 21, India 18 and UK 18. Descriptive statistics for the remainder of the population (U.S. with international addresses and permanent residents) are not available.

percent of the undergraduates were non-U.S. citizens and an additional 25 percent held dual citizenship. Approximately, 13 percent were U.S. citizens and the remaining few were permanent residents.

For purposes of this paper, we will focus on the difficulties that international students reported encountering, their interactions with faculty and students, and their overall satisfaction with the university and their educational experience.

Results

International students were asked to identify those things that had been difficult for them since matriculating at Tufts. By far the most problematic adjustment for these students was getting used to college food. Respondents indicated that it was difficult to adjust to American food, because it was less flavorful, greasy and not spicy. In addition, they expressed concern about being required to eat their evening meal much earlier than they normally would if they were in their home country. The latter complaint was a reflection of dining services hours, where meal service was suspended at 7 p.m. Approximately 36 percent of the respondents voiced concerns about finding employment. This reflects students' frustration with U.S. Citizenship and Immigration Services restrictions that 1) do not permit students to work off-campus or to pursue paid internships without some advanced planning, 2) cause unanticipated delays, and 3) have implications regarding employment after graduation. A number of issues surrounding communication have proven difficult for international students: 1) writing papers, 2) speaking in class, and 3) understanding American slang. For a about a quarter of the respondents social related issues were problematic: 1) living with a roommate, 2) being away from their family, 3) making American friends, and 4) dating Americans or someone not from their culture.

The students were presented with a number of questions in order to ascertain their level of interaction with faculty, staff, and other students. Approximately half of the students reported that during the academic year that they had spoken with a faculty member and their advisor "often" or "very often". About a quarter indicated that they had frequently visited informally with an instructor after class or had made an appointment to meet with a faculty member, while the majority indicated that they had such contact on an occasional basis. International students were not inclined to meet with academic deans or staff at Career Services. Approximately half of the respondents indicated that they had never met with an academic dean and almost 60 percent reported that they had never spoken with Career Services staff members.

While International students did not report interacting frequently with faculty and staff, they did report frequent interactions with their fellow students. At least 80 percent of our respondents reported having done the following "often" or "very often" in the academic year: 1) made friends with students from a country different than their own, 2) made friends with students whose academic interests were different than theirs, 3) made friends with students whose non-academic interests were different than theirs, 4) made

friends with students whose family backgrounds were very different from theirs, 5) made friends with students whose race was different from theirs, and 6) made friends with students whose religions were different from theirs. Thus, it appears that international students are acclimating to the university environment and developing relationships with their peers.

International students reported being involved in a variety of academic related activities during their tenure at the university. Most reported that they had made class presentations, participated in group project assignments, discussed academic topics with fellow students and attended cultural events, concerts and art exhibitions. When we compared these findings with those of graduating seniors we found that there were very few differences in the responses between the two populations. Again, this reinforces the notion that international students are participating in academic related activities at the same rates as domestic students. Students were also presented with an opportunity to respond to the following open-ended question: "During the academic year, what do you do in your free time?" Their responses were typical of those that one would anticipate hearing from any American college student: 1) socialize – spend time with friends, go to parties, go to clubs, bars, or coffee shops, 2) go to Boston[5], 3) read, watch movies and/or television, 4) play sports, 5) go to the gym, 6) sleep and 7) study.

Overall, respondents were very positive about their undergraduate experience. Ninety percent indicated that they were either "enthusiastic about" or "liked" Tufts and approximately the same percentage of students reported that if they could start all over again they would attend Tufts. Eighty-six percent reported being "satisfied" or "very satisfied" with their undergraduate education. No one reported being "dissatisfied" or "very dissatisfied." Over 90% indicated that they would recommend Tufts as a good place for international students. Those factors that contributed to making the institution a "good place" for international students were 1) having a significantly large number of international students from a wide array of countries, 2) being perceived as a welcoming open-minded community, 3) having good administrative support, especially the international center, for students, 4) having a large and varied number of cultural organizations, and 5) being near a major city. These same themes were reinforced when students described the "best things" about the university: 1) the close knit friendly student body and sense of campus community, 2) its location, specifically the proximity to Boston, 3) high quality academic programs, 4) the strong international focus, both with regard to programming and strong international community, and 5) the faculty, whom students described as approachable, engaging, intelligent, helpful, and caring about students.

Students were afforded an opportunity to provide comments regarding the worst things about the institution. Most provided written commentary. International students

[5] It should be noted that Tufts is very close to downtown Boston, which is a 15-minute, T (subway) ride away.

included such things as 1) the social life on campus,[6] 2) the facilities, 3) limited availability of course offerings, and 4) the cost of living. Students tended to provide very little detail when describing the worst things about the institution. From the information that was provided, we were able to infer that respondents appeared to be dissatisfied with quality of their living arrangements – small rooms and lack of private bathroom facilities. Dissatisfaction with the social life appears to be related to the fact that most parties end at 2 a.m., underage drinking restrictions are enforced, and that it is difficult to return to campus in the wee hours of the morning because public transportation is not longer operating. For students who expressed dissatisfaction with the faculty, their comments were associated with the perception that some faculty were "not very friendly", that the quality of teaching was "not uniformly excellent", and that some faculty were "not consistently available". Students had high expectations and wanted faculty to be approachable, accessible, intelligent, and caring. The concerns that were registered by international students are not dissimilar to those expressed by domestic students.

Discussion

Our initial findings are similar to those reported in the literature. Similar to the Wan et al. (1992) and Tompson & Tompson (1996) findings, our international students reported several issues involving difficulty with language: 1) writing papers, 2) speaking in class, and 3) understanding American slang. In addition, social related issues were problematic for about a quarter of our respondents: 1) living with a roommate, 2) being away from their family, 3) making American friends, and 4) dating Americans or someone not from their culture.

As a result of this study, the university has made changes to positively impact international undergraduates' experiences. Additionally, several recommendations have been made regarding ways to share the findings with faculty and staff that interact with international students on a regular basis.

An immediate impact of the survey was observed by the actions of the Tufts International Board of Overseers. The survey results reinforced the Board's decision to focus on fundraising for financial aid for international undergraduate students as a primary Board objective.[7] Secondly, the University Trustees proposed that the university create an alumni career professional staff position that would connect alumni with undergraduates in order to facilitate opportunities for job networking. This position is intended for all alumni, including the international alumni. The International Board of Overseers has been quite interested in promoting internships for current undergraduate international students during the summer months either in the U.S. or overseas. The new position in Career Services will be addressing this need.

[6] This response is not reserved solely for international students. Many undergraduates voice similar concerns, several of which are related to the University's alcohol policy.

[7] From our survey of international students, we learned that approximately 50% of the respondents had some concern regarding their ability to finance their postsecondary education.

An area of concern expressed by the undergraduates surveyed was their frustration in not being able to secure internships in the U.S. because of their visa status. The International Center responded by offering more workshops addressing the questions of legally working off-campus especially over the summer months. In this way, students can make better decisions about job/internship opportunities during their four years at Tufts.

Over the past several years, the University Administration and Trustees have been acutely aware of the need for additional residential facilities. The international students, who expressed concern about the lack of residential facilities, further documented this need. In the near future, construction will begin on a new residence hall that will accommodate approximately 150 more students who wish to live on-campus. Although one new residential facility will not eliminate the housing problem, it is another step toward addressing an ongoing student concern.

The survey results have impacted the services that are provided to international undergraduate students. The survey validated anecdotal information supporting the goals of International Orientation (I.O.). This pre-orientation program invites incoming international students on visas, U.S. permanent residents, Americans living overseas, including students from Puerto Rico and other U.S. territories, and Americans who indicate an interest to major in International Relations or who are from the Boston area. I.O. addresses issues highlighted in the survey results: 1) getting used to living with a roommate, 2) getting used to American college food, 3) understanding American slang, 4) making American friends, and 5) being away from home. Friendships are formed at I.O., which include groups of many nationalities, including Americans. Additionally, there are other opportunities for international students to get involved with structured intercultural activities offered by the International Center. One way is by becoming a Host Advisor for International Orientation, another is by living in the International House or by being on the Executive Board of the International Club. All of these opportunities involve a group of students that are composed of different nationalities, including Americans.

The newest program of the International Center is Coffee Chat. This program occurs weekly where the International House residents invite the Tufts community to come for an hour of conversation on topics such as family, education, religion and government. The program was originally designed to give graduate international students an opportunity to practice spoken English, but the advertising has attracted undergraduate students to participate in the program as well. This development has added a new dimension in getting international and American students interacting in a structured yet informal setting. Additionally, Coffee Chat has an element of American slang, another area highlighted by students surveyed.

Finally, the collaboration between the Office of Institutional Research and the International Center has been extremely positive. Since this was a commissioned study, the survey was developed with significant input from the International Center and the

items were targeted to address areas of perceived concern. The survey findings have given more visibility to the issues facing international undergraduate students at Tufts. The anecdotal stories have been proven true and the Tufts Administration is listening and responding to this information.

What will happen next? A goal would be to systematically present the data to departments who could benefit from the information such as the Writing Center, the Office of Residential Life and Learning, Office of Career Services and the Undergraduate Deans and faculty who advise students on academic matters. The survey will be repeated to see if the results remain constant or if new factors have emerged especially since the impact of 9/11 and the student/scholar tracking system, known as SEVIS are now being felt. And lastly, a decision should be made if this survey will be administered on a regular basis, every 2-3 years, for example.

In addition, we hope to administer the survey to international students at several additional U.S. institutions, as well as to international students studying at non-U.S. institutions. We are curious to ascertain how international students' experiences differ across sectors and continents.

References

Al-Sharideh, K. & Goe, W. R. (1998). Ethnic communities within the university: An examination of factors influencing the personal adjustments of international students. *Research in Higher Education*, *39*(6), 699-725.

Sheehan, O. T. O. & Pearson, F. (1995). Asian international and American students' psychosocial development. *Journal of College Student Development*, *36*(6), 522-530.

Tompson, H. B. & Tompson, G. H. (1996). Confronting diversity issues in the classroom with strategies to improve satisfaction and retention of international students. *Journal of Education for Business*, 72(1), 53-57.

Wan, T., Chapman, D. W. & Biggs, D. A. (1992). Academic stress of international students attending U.S. universities, *Research in Higher Education, 33*(5), 607-623.

EMAIL CONTACTS: A TEST OF COMPLEX GRAPHICAL DESIGNS

Michael E. Whitcomb
Assistant Director of Institutional Research
Stephen R. Porter, Ph. D.
Director of Institutional Research

Office of Institutional Research
Wesleyan University

Abstract

A web survey of high school students was used to understand how the visual design of the email contact affects survey response. Respondents were contacted with one of six email designs that varied by format (text versus HTML), color of background (white versus black) and graphical design (simple versus complex). Our results indicate that emails with non-white backgrounds and complex graphical designs can suppress response rates more than 5 percentage points.

Introduction

With their low cost, relative ease of administration, and immediate access to respondent data, surveys administered via the web can be a powerful tool for researchers. As with any type of survey administration, whether paper, telephone, in-person, or electronic, we need to know how to use web survey methods effectively to ensure quality data. Currently, we know much about how to design web surveys (e.g., Couper, 2000; Couper, Traugott, & Lamias, 2001; Crawford, Couper, & Lamias, 2001; Dillman & Bowker, 2001; Dillman, Tortora, Conradt, & Bowker, 1998; Tourangeau, Couper, & Steiger, 2001), but experimental research on methods of contact in web surveys is still limited (Porter & Whitcomb, in press).

The purpose of this research is to understand how the visual design of the email contact affects web survey response. Now that almost all email software programs accept email in HTML format as well as email in text file format, the design possibilities are endless. Rather than being constrained to simple black text on white background, it is now possible to send emails with different colored backgrounds, different font types and sizes, and embedded graphics.

What is unknown, however, is whether these "fancier" email contacts increase response rates, have no effect, or perhaps even decrease response rates. For example, Dillman and his colleagues (Dillman et al., 1998) have shown that adding design features such as complex graphics and alternating background colors to a survey reduced the response rate by 11 percentage points.

Using a web survey of prospective college applicants, we conducted an experiment to test the effect of email design on response rates in a web-based survey. In this experiment, we sought to answer three research questions. First, is survey response different for HTML and text email messages? Because HTML-based emails usually have longer download times than simple text emails, the use of HTML emails in a survey could result in lower response rates not because of cognitive design issues, but simply because some respondents became frustrated at the length of time necessary to access the message.

Second, does the background color of the email affect survey response? Given the Dillman et al. (1998) findings, it seems possible that the use of non-white backgrounds in email contacts could have the same negative impact as their use in web survey design. Dillman et al. hypothesized a lower response rate due to download time differences between their "fancy" survey and their plain survey. However, it may also be possible that respondents simply prefer simple designs to more complex designs. Too complex a design is a frequent criticism of websites, with simpler designs generally viewed as aesthetically preferable.

Third, does the inclusion of photographs and graphics in email messages affect survey response? Although Dillman et al. (1998) found that the inclusion of graphics in a survey suppressed response rates, some researchers would argue that the skillful use of photographs and graphics in an email contact would possibly pique the respondent's interest, and at a minimum would result in a more "professional look" than a simple text email. Moreover, given the extra time required to design such an email message, respondents could infer that the sender spent more resources on the contact, much in the same way that a postage stamp affixed to an envelope rather than metered postage sends a message of time spent on a survey mailing. Conversely, colored backgrounds and graphic images are often used by spammers in their messages, and thus may reduce response rates.

Method

The study is based on a web survey of high school students who had contacted a selective liberal arts college for information, but did not apply for admission. The survey was conducted in February 2003 and asked over fifty questions about perceptions of the college and reasons for not applying to the college. In terms of design, the survey consisted of black text on a white background, with the exception of the use of alternating white and grey bands for questions with multiple item responses.

The salience of this survey is low, as evidenced by the 15% response rate in a similar version of the survey administered one year previously. After 595 bad email addresses were removed using a script that checks the validity of each email address on the email server, the remaining sample size was 6,090.

All students in the sample were sent an initial email, and non-respondents were sent up to two follow-up emails. The email design remained constant for each experimental group, and each email contained a unique URL that automatically logged the student into the survey. The overall response rate for the survey was 10.9% (N = 663).

In order to test the effects of the file format and design features incorporated into email contacts, we divided the sample into six experimental groups. As seen in Table 1, two groups were sent text email messages, while the remaining four groups were contacted using emails in HTML format. Within the text email condition, one group received a plain text message without a header that simply began with the salutation, "Dear Student." The second group received an email message with a text header at the top of the page, consisting of the sponsoring institution name between two lines:

INSTITUTION NAME

Because of the limited design capabilities of text files, all text emails consisted of black text on a white background.

Table 1. Experimental Design and Response Rates

Experimental group	Email file format	Design features: Background	Design features: Header [b]	Design features: Download time (seconds) [c]	Response rate (%)	N
A	Text	White [a]	None	< 1	10.0	1,015
B		White [a]	Simple	< 1	11.8	1,015
C	HTML	White	Simple	3 [d]	13.6	1,015
D		White	Complex	13 [d]	11.5	1,015
E		Black	Simple	1	10.2	1,015
F		Black	Complex	11	8.2	1,015
Total					10.9	6,090

[a] White is the default background for text emails.
[b] A *simple* header consisted of the name of the sponsoring university, a *complex* header consisted of the name of the sponsoring university, as well as an image of campus and a quote from the President.
[c] Download time is estimated in seconds using a 28.8K modem.
[d] Download times are slightly longer for HTML files with white backgrounds because the graphic file used to insert the name of the sponsoring university in these pages was 3 KB larger than the graphic file used in the HTML files with black backgrounds.

In the four HTML email groups, two aspects of the email were altered: the type of header, simple or complex, and background color of the email, white or black. Simple headers consisted of the institution name only, while complex headers directly mimicked the university homepage by including the institution's name, a campus photograph, and a quotation from the university President. Unlike the text header, which consisted of plain text, the header and quotation text used colored fonts of various sizes. Black and white were chosen as background colors for two reasons. First, using white as a background in an HTML email allows a comparison with a text email, whose default background color is white. Second, the black background mirrored the design of the institution's homepage and seemed a natural color choice given that many of the sample members had previously viewed the institution's website.

This experimental design allows us to make several comparisons between simple and more complex email designs, between complex text and HTML-based emails, and between HTML emails with different colors and graphic elements. By comparing the two text email groups, we can test the impact of more complex graphical designs in a non-HTML format, albeit a rudimentary graphical design. Comparison of the text and HTML simple header groups shows the impact using HTML versus text while employing similar graphical designs. Finally, the four HTML groups allow us to investigate the effects of background color and more complex graphical designs on survey response, and to test if the Dillman et al. (1998) findings about surveys also apply to email contacts.

Results

To determine whether the file format and header design of our email contacts affected survey response, we conducted a series of chi-square analyses, comparing specific experimental groups. Survey response rates for the six experimental groups are presented in Table 1, with more detailed information for the four HTML groups presented in Table 2.

Table 2. Response Rates by HTML Email Category

	Email header		
Background color	Simple	Complex	Total
White	13.6	11.5	12.6
Black	10.2	8.2	9.2
Total	11.9	9.9	

Inclusion of a header in text emails

While the response rates for respondents receiving text emails with a simple header differed from those receiving a text email with no header (10.0% and 11.8%, respectively), chi-square analyses revealed that this difference was not statistically significant ($\chi 2(1) = 1.83$, p= .18). Design features at the most basic level - text headers in text email files - did not affect the probability of response.

Format of the email file

To test whether the file format of the email message (i.e., text or HTML) affects survey response, we compared the response rates of two pairs of experimental groups. First, we compared the response rate of participants mailed an HTML message with a white background and a simple header to the response rate of participants sent a text email with a header (group C vs. group B). Since these two emails appear very similar to the end recipient, this comparison tests the effect of using HTML versus text email messages. Give their similarity in appearance, it is not surprising that the response rates of these two groups did not significantly differ: the response rate for the HTML email with a white background and simple header was 13.6%; the response rate for the text email with a header was 11.8%.

In the next test we examined whether participants sent an HTML message with a white background and a simple header were more likely to respond to our survey than participants solicited using a plain text email without a header (group C vs. group A). In this analysis, we are examining the cumulative effect of sending email messages as HTML and the inclusion of a header. Chi-square analyses revealed that participants sent the HTML email with a white background and a simple header were more likely to respond to the survey than participants mailed the bare-bones text message, with a modest difference in response rates of 3.6 percentage points ($\chi^2(1) = 6.49$, $p = .01$).

HTML Design features

The results described above suggest a trend of increasing survey response as we move from plain text email contacts (10.0%), to text emails with a header (11.8%), to HTML emails with a white background and simple header (13.6%). We further tested this trend by examining the impact of using simple versus complex headers, and white versus black backgrounds in HTML emails (groups C, D, E and F). Chi-square analysis demonstrated that the survey responses rates of these four groups significantly differed, $\chi 2(3) = 15.81$, p = 0.001.

As seen in Table 2, the use of black as the background color suppressed response rates by over three percentage points. This effect holds within the simple header condition (13.6% versus 10.2%, $\chi^2(1) = 5.77$, $p < .05$), within the complex header condition (11.5% versus 8.2%, $\chi^2(1) = 6.01$, $p < .05$), and overall (12.6% versus 9.2%, $\chi^2(1) = 11.74$, $p < .001$).

The impact of header design in HTML email was smaller. The response rates of participants receiving HTML emails with complex headers were two percentage points lower than the response rates for participants receiving HTML emails with simple headers. This finding was only statistically significant when both background color conditions were combined (see Table 2); the overall response rate for HTML emails with simple headers was 11.9%, while the response rate for HTML emails with complex headers was 9.9%, $\chi^2(1) = 4.06$, $p < .05$.

Finally, as seen in Table 2 we can see a cumulative effect of background color and header complexity. Among the six experimental groups, the group with the highest response rate was the HTML with white background and simple header group, with 13.6%, and the group with the lowest response rate was the HTML with black background and complex header group, with 8.2%. The HTML email group with the simplest design was significantly more effective in soliciting survey response than the HTML email group with the most complex design, $\chi^2(1) = 14.75$, $p < .001$. In addition to the statistical significance of this finding, the magnitude of this effect, 5.4 percentage points, is not inconsequential.

Discussion

The results presented here indicate a difference in survey response of more than 5 percentage points simply due to the design of the contact emails sent to respondents asking their participation in a web survey. While this difference is modest, it should be borne in mind that this result occurred with a traditionally uncooperative population using a simple design alteration. To put this finding in perspective, Dillman et al.'s (1998) experiment altering the background of the survey itself found an 11 percentage point difference between the simple and complex experimental groups.

Interestingly, the results of the Dillman et al. (1998) research imply that experimental group A, the simple text email group, should have had the largest response rate, but the group with the largest response rate received an HTML email with a white background and simple header listing the name of the institution (group C). This indicates that perhaps some design elements in a contact email may increase response rates, but that researchers must also strike a balance in design. Too much detail may result in cognitive overload; alternatively, too much detail may remind email recipients of spam email, which often uses bright colors and varying fonts and graphics.

One question that remains unanswered is why respondents tend to prefer simple contact and survey designs over more complex designs. Unfortunately complex designs that include graphics have longer download times in comparison to simpler designs (see Table 1). Thus we cannot distinguish between differences due to download time and differences due to cognitive overload.

Research on the readability of webpages sheds some light on our findings that response rates were higher for groups that received emails with black text on white backgrounds versus white text on black backgrounds. One study testing participants' reaction time searching for a target word in a text on a computer screen found that reaction times were lower for black-on-white texts than for white-on-black texts (Hill & Scharff, 1999). Similarly, a study of reading performance on computer displays found that white-on-black text resulted in significantly poorer reading performance than black-on-white (Bangor, 1998). User preferences also tend towards darker text on light backgrounds over lighter texts on darker backgrounds (Takahashi, Yamanishi, & Sasaki, 2001).

The impact of text and background color on response rates may also result from preferences for certain design choices rather than perceptual ability. For example, respondents view black-on-white webpages as much more "professional" than white-on-black webpages (Hall & Hanna, 2003).

Because web surveys are becoming more common, the visual design of a survey and its email contacts are increasingly important, as researchers struggle for cooperation among a sea of competing surveys and spam emails. However, the search for design features that will allow researchers' email solicitations to stand apart from ubiquitous spam is a delicate balancing act. As spam filtering software becomes more sophisticated and widely used, the features that improve the effectiveness of email solicitations for survey participation may also increase the likelihood that the incoming message is labeled as spam. For example, the email filtering software package SpamAssassin assigns 'spam points' to email messages that are written in HTML, contain the salutation 'Dear (someone)', use various font and background colors, contain images, or contain HTML links that ask the reader to "click here".

More importantly, it is not entirely clear if simple designs and black-on-white texts are the best choice in designing contact emails and web surveys, nor if other visual aspects of emails and surveys may suppress response rates. In their response time experiment, for example, Hill and Scharff (1999) found that color combinations other than black-on-white yielded the fastest response times, while another study found a significant effect of text width and margin width on readability (Youngman & Scharff, 1999). Clearly survey researchers must begin to think more about visual design aspects of their surveys, and how these design elements affect respondent behavior.

References

Bangor, A. W. (1998). *Improving access to computer displays: readability for visually impaired users.* Unpublished Master's thesis, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Couper, M. P. (2000). Web surveys: A review of issues and approaches. *Public Opinion Quarterly, 64*, 464-494.

Couper, M. P., Traugott, M. W., & Lamias, M. J. (2001). Web survey design and administration. *Public Opinion Quarterly, 65*, 250-253.

Crawford, S. D., Couper, M. P., & Lamias, M. J. (2001). Web surveys: perceptions of burden. *Social Science Computer Review, 19*(2), 146-162.

Dillman, D. A., & Bowker, D. K. (2001). The web questionnaire challenge to survey methodologists. In U.-D. Reips & M. Bosnjak (Eds.), *Dimensions of Internet Science*. Lengerich: Pabst Science Publishers.

Dillman, D. A., Tortora, R. D., Conradt, J., & Bowker, D. K. (1998). *Influence of plain vs. fancy design on response rates for web surveys.* Paper presented at the Joint Statistical Meetings, Dallas, TX.

Hall, R. H., & Hanna, P. (2003). *The effect of web page text-background color combinations on retention and perceived readability, aesthetics and behavioral intention.* Paper presented at the The Americas Conference on Information Systems, Tampa, FL.

Hill, A. L., & Scharff, L. F. V. (1999). *Readability of websites with various foreground/background color combinations, font types and word styles.* Paper presented at the National Conference on Undergraduate Research, Washington, DC.

Porter, S. R., & Whitcomb, M. E. (in press). The impact of contact type on web survey response rates. *Public Opinion Quarterly*.

Takahashi, J., Yamanishi, J.-i., & Sasaki, K. (2001). *Readability and preference of websites with various color combinations and font size for older users.* Paper presented at the International Conference on Computers in Education, Seoul, Korea.

Tourangeau, R., Couper, M. P., & Steiger, D. M. (2001). *Social presence in web surveys*. Paper presented at the Federal Committee on Statistical Methodology Research Conference, Arlington, VA.

Youngman, M., & Scharff, L. F. V. (1999). *Text width and margin width influences on readability of GUIs.* Paper presented at the National Conference on Undergraduate Research, Washington, DC.

COMMUTER AND RESIDENT STUDENTS: ATTITUDES, EXPECTATIONS, AND THEIR INFLUENCES ON INTEGRATION AND PERSISTENCE

B. Lauren Young, Research Analyst
Office of Institutional Analysis
University at Buffalo

Over the past twenty years, the proportion of undergraduates who commute to primarily residential institutions of higher education, like the proportions of other nontraditional students, has risen dramatically. The increase in the commuter student population has been an expected result of improvements in access to higher education for previously underserved groups, for example, under-represented minorities and lower-income students (Jacoby, 2000a). Unfortunately, this shift has not often been accompanied by changes in institutional policies that are pertinent to commuters (Wittkopf, 1994). In particular, the traditional resident-oriented policies have not adequately addressed ongoing difficulties in retaining commuters.

Background

Numerous educational researchers have observed the influence of the freshman residential experience at four-year institutions, and virtually all have reached the same conclusion, that students who live on or near campus during their first year are more likely to persist and to complete their baccalaureate degrees (Pascarella & Terenzini, 1991). Even when researchers account for prior academic achievement, like high school grade point average and SAT scores, and for gender, race, and socioeconomic status, first-year residence still exerts a unique, positive effect on persistence to degree. The importance of these findings is underscored by the finding that 86% of all students across the nation commuted, that is, did not live on or near campus, in academic year 1995-96 (Horn & Berktold, 1998). Many of these commuters did not attend community colleges or other traditionally commuter-based institutions.

Tinto's (1975) model of student attrition is the most common and best-supported one used to explain the impact of on-campus residence. Tinto holds that students are prone to drop out of an institution of higher education when they fail to achieve a sufficient level of integration within the academic and/or social systems of that institution. Integration here is defined as an actual or perceived fit between a student and an institution. On-campus residence, in this context, is a means for students to effectively transition from the social structures of their high school and home lives to their new college society. Here students together can learn the norms of their institution and find niches that give them a stake in their collegiate futures while finding social support from one another. The residential experience retains its power even when students live on campus only as freshmen, as is common today. In fact, on-campus residence appears to have its greatest impact on such students at their lowest levels of integration (Bean, 1985).

Those who do not take advantage of the opportunities presented in their new campus residences and instead remain more strongly linked to the social networks of high school often report feeling relatively "out of touch" and more dissatisfied with their college experiences (Christie & Dinham, 1991). In contrast, those who immerse themselves in the culture of their residences typically take on attitudes and values more in line with the goals of the institution (e.g., academic achievement orientation; cultural and artistic interests; multiculturalism; Pascarella & Terenzini, 1991). Those who are less active in the culture of the institution are relatively prone to dissatisfaction, absenteeism, and dropping out (Finn & Voelkl, 1993).

Tinto's model clearly explains how commuters become increasingly differentiated from residents after matriculation. Although Tinto observes that pre-matriculation attitudes can give rise to varying initial levels of institutional commitment, comparatively little research has explored the impact of these pre-existing, external differences on integration and persistence (Cabrera, Castaneda, Nora, & Hengstler, 1992). In any social group, proximity and the ability to easily exchange information tends to more greatly polarize attitudes (Anderson & Graser, 1976). It is not unreasonable to expect that these conditions might exacerbate existing differences between residents and commuters.

Some theorists, most notably Bean (1980), suggest that Tinto's student integration model unduly de-emphasizes the impact of external demands on commuters. The most elementary of these demands may be transportation, although this not only encompasses the daily difficulty of finding an on-campus parking space but also includes cost, scheduling, and alternative arrangements. Commuters also are more likely to have multiple life roles and responsibilities than residents. They may more frequently be spouses, parents, and employees as well as students. Similarly, commuters tend to have more diverse support systems than residents and rely to a greater extent on spouses, relatives, friends, employers, and others off campus to negotiate the demands of a college education (Jacoby, 2000a).

Cabrera, Castaneda, Nora, and Hengstler (1992) have indicated that student integration and external demands each exert unique effects on persistence. The present research attempted to extend this work to a somewhat different institutional setting (e.g., size, geography, and mission varied noticeably). We examined local differences between commuters and residents on student integration and external demand variables. Where between-group differences existed, we assessed the relative impact of student integration and external demands on long-term persistence and graduation rates.

Methodology

Our institution is an urban research university located in Western New York State. It enrolls approximately 27,000 students each fall, of which approximately 17,000 are undergraduates. A substantial minority of our first-time freshmen claims a permanent residence in one of the eight Western New York counties (i.e., Erie, Niagara, Orleans,

Genesee, Wyoming, Allegany, Cattaraugus, or Chautauqua; 42% did in Fall 2003) and commutes from an off-campus residence (30%).

We collected data primarily during the university's annual administration of the Cooperative Institutional Research Program's (CIRP) freshman survey in the summer of 1997. The CIRP survey is a well-known, nationally normed paper-and-pencil instrument developed by Alexander Astin and the Higher Education Research Institute (HERI). First-time, full-time freshmen intending to enroll in Fall1997 and attending our on-campus summer orientation program completed the survey.

We obtained secondary, follow-up data from our institutional data warehouse. These data included enrollment status and total credit hours for each semester as well as any degree dates.

For the purposes of this study, we defined residents as all students who reported on the CIRP survey that they intended to live in a dorm during their freshman year and considered all others to be commuters. This definition contrasted slightly with the traditional notion that residents may live on or near campus. Due to the physical layout of our campus, however, it was highly unlikely for students to live in the areas adjacent to campus as they might at other institutions. Students who did not live on campus were unlikely to be able to walk to classes and to other on-campus activities and to truly have the experience of on-campus life that students in dorms did.

In addition, we defined retention as either the completion of a baccalaureate degree at this institution or enrollment in the Spring 2003 semester, regardless of whether the student had stopped out in prior semesters.

Results

During the summer of 1997, 1477 first-time, full-time freshmen completed the CIRP survey. Of these freshmen, 998 (68.1%) expected to live in on-campus dormitories during their first year at the university. We assumed that these expectations would translate into actual on-campus residence during the year, due to the proximity of the July survey to the start of the Fall semester.

We observed that 87% of all respondents were either commuters from Western New York (WNY) or residents from other geographic regions. Had we simply compared residents and commuters, our results would likely have been confounded by the effects of cultural differences between WNY and other parts of New York State. We therefore chose to conduct three-group comparisons of commuters, WNY residents, and residents from other geographic areas (hereafter, "non-WNY"). Thirteen students claiming to commute from non-WNY areas were dropped from our analysis.

Commuters were more likely than others to be female (48.9% vs. 43.8% for WNY residents vs. 43.2% for non-WNY residents) and less likely to be in an underrepresented minority group (10.4% vs. 12.1% vs. 16.3%). They had high school GPA's of A- or

better more often than non-WNY residents (49.9% vs. 28.8%), although they did not perform as well as WNY residents (56.8% had high school grades averaging in the A range). Commuters were also most likely to cite this institution as their first choice (72.0% vs. 50.3% for WNY residents vs. 47.7% for non-WNY residents). Nonetheless, commuters less often came from households with annual incomes of $75,000 or higher (25.1% vs. 34.4 vs. 37.6%), had the lowest mean SATs of the three groups (1139 vs. 1193 vs. 1140), and were least likely to graduate or persist to the six-year follow-up (58.4% vs. 68.2% vs. 65.1%).

We conducted a logistic regression analysis to assess the unique contributions of gender, minority status, high school GPA, SAT totals, household income, and commuter status to six-year persistence. With all other variables held out of the regression analysis, commuter status still predicted a significant reduction in the likelihood of student persistence.

Clear patterns of between-group background differences appeared in our analyses of college choice issues and future expectations. When asked why they chose to attend college in general, WNY residents most often stated an interest in becoming more cultured (Table 1). Commuters, in contrast, were less interested in culture and in general education and were more influenced by a parent's wish or by the desire to earn more money.

Table 1. Percentages of students endorsing selected reasons as very important to their college matriculation decisions

	Resident		Commuter
	Non-WNY	WNY	WNY
	(n=822)	(n=176)	(n=454)
Reasons for attending college			
Improve study skills	**40.3**	33.9	37.0
Get a better job	**72.7**	77.6	76.2
Become more cultured	36.9	**42.9**	**26.6**
Gain a general education	62.5	64.0	**57.2**
Parent's wish	29.3	30.7	**34.2**
Make more money	72.7	73.7	**79.0**
Reasons for choosing this institution			
Good social reputation	**35.8**	25.6	25.8
Size of college	**24.2**	21.6	19.1
Guidance counselor's advice	7.8	**4.1**	8.6
Recruited by athletic department	3.2	**7.1**	1.7
Low tuition	53.3	**47.7**	**60.6**

In choosing this institution in particular, non-WNY students most often valued its social reputation and its size. Commuters were most responsive to the school's low tuition. In general, others' wishes had little differential impact on the choice of our institution, although WNY residents were somewhat less influenced by guidance counselors' recommendations than others. The influence of financial aid, unlike that of tuition, was consistent across residential groups. The residential groups also did not differ in the impact of special programs or recruitment by college representatives.

Looking toward their futures, non-WNY residents most often stated desires to influence social values, to help others in difficulty, and to promote racial understanding (Table 2). WNY residents most often wished to obtain authority in their chosen field, to contribute to science, to achieve in the performing arts, to create artistic work, to write original works, and to develop meaningful life philosophies. They were less interested than others in raising families, gaining wealth, and taking administrative responsibility, though clearly many in this group did value these pursuits. Aside from a slightly greater inclination for commuters to take community action, the groups did not differ in their political motivations (e.g., recognition from colleagues; political influence and leadership; environmental cleanups).

Table 2. Percentages of students stating that selected goals are very important or essential

	Resident		Commuter
	Non-WNY	WNY	Non-WNY
Student goals			
Influence social values	**32.2**	27.9	29.6
Help others in difficulty	**59.8**	53.7	56.6
Promote racial understanding	**36.1**	31.9	24.5
Become authority in my field	64.3	**68.3**	61.9
Make contribution to science	20.0	**25.2**	20.4
Achieve in a performing art	9.4	**16.0**	9.9
Create artistic work	15.7	**19.5**	11.9
Write original works	13.1	**17.8**	10.5
Develop meaningful life philosophy	39.7	**44.8**	40.6
Raise a family	70.6	**59.2**	73.2
Be well off financially	80.7	**76.8**	83.0
Have administrative responsibility	37.2	**33.3**	39.1
Take part in community action	18.4	15.3	**19.6**

As undergraduates, non-WNY students most often expected to play varsity athletics or join a Greek letter organization, and least often considered that they might obtain a job to pay college expenses (Table 3). WNY residents most frequently reported that they would likely graduate with honors, serve in a student office, or join in student protests.

Commuters were most prone to work full-time, get married while in college, and need extra time to earn their degree. Commuters were least inclined to transfer to another institution prior to earning their baccalaureate or to seek counseling. The three residential groups were similar in their expectations that they would gain entry to an honor society, earn at least a B average, receive a baccalaureate, drop out permanently, and be satisfied at our institution.

Table 3. Percentages of students perceiving some chance or a very good chance that selected college events will occur

	Resident		Commuter
	Non-WNY	WNY	Non-WNY
Expected college events			
Play varsity athletics	**38.6**	35.0	31.1
Join fraternity or sorority	**62.5**	46.3	56.2
Get job to pay expenses	**75.3**	84.1	84.3
Graduate with honors	76.7	**80.4**	74.2
Be elected to student office	23.8	**31.3**	26.2
Take part in student protests	36.9	**48.8**	32.7
Drop out temporarily	3.6	**8.1**	3.9
Work full-time	9.3	14.8	**25.8**
Marry while in college	13.0	19.3	**25.5**
Need extra time for degree	43.7	41.9	**49.4**
Transfer to another institution	37.7	39.5	**31.5**
Seek personal counseling	37.1	40.9	**31.4**

Table 4. Percentages of commuter students persisting when stated concerns are more or less important in college matriculation decisions

	Rating	
	Not Important or Somewhat Important	Very Important
Reasons for attending college		
Parent's wish	57.1	60.1
Make more money	54.8	58.9
Gain a general education	*54.7*	*60.7*
Become more cultured	*58.4*	*57.1*
Reasons for choosing this institution		
Low tuition	55.6	60.8
Guidance counselor's advice	58.8	59.5
Recruited by athletic department	*58.4*	*57.1*

The impact of college choice considerations on six-year persistence rates varied considerably for commuters (Table 4). Commuters who attended college due to a parent's wish or the prospect of making more money were more likely to persist, as were those who chose this institution due to its low tuition. These concerns were more characteristic of commuters than they were of residents. However, commuters who did not consider a general education important in attending college, a relatively common stance within this group, less often persisted to the six-year mark.

Relationships between baseline values and six-year persistence often varied substantially between commuters and their WNY residential counterparts. For the latter group, parents' wishes and students' interests in general education were not related to persistence. WNY residents attending college in order to make more money were less likely to persist. Concerns with low tuition in the college choice process, however, were related to increased persistence among WNY residents as well as commuters.

Commuters' predisposition toward goals of financial security was related to increased persistence (see Table 5). Their lesser interest in many traditional academic goals (e.g., contribution to science; writing original works; developing a meaningful life philosophy), in contrast, appeared to handicap their chances of persisting and graduating because each was related to increased retention among commuters. These patterns did not translate similarly to the WNY resident group, in which those seeking to create artistic works or to develop meaningful philosophies were less apt to persist.

Table 5. Percentages of commuter students persisting when selected goals are considered more or less important

	Rating	
	Not Important or Somewhat Important	Very Important or Essential
Student goals		
Be well off financially	51.4	60.7
Have administrative responsibility	59.0	58.8
Raise a family	58.4	59.6
Engage in community action	58.5	59.8
Become authority in field	*52.8*	*63.0*
Contribute to science	*56.9*	*67.4*
Achieve in performing arts	*57.9*	*66.7*
Create artistic work	*57.7*	*68.0*
Write original works	*58.4*	*65.9*
Develop meaningful life philosophy	*56.3*	*63.3*
Promote racial understanding	*59.3*	*57.3*

Commuters' persistence was negatively associated with their tendencies to work full-time, to marry while in college, and to join a Greek letter organization more often than WNY residents and with their reduced expectations of graduating with honors (Table 6). Commuters' lesser inclination to be involved with student government, varsity athletics, and student protests were related to increased persistence, as were their resistances to dropping out, transferring, and seeking counseling. For WNY residents, relationships between college expectations and six-year persistence were strikingly similar; with the exception that marriage was linked to increased retention for them.

Table 6. Percentages of commuter students persisting when selected college events are perceived as having a greater or lesser chance of occurring

	Rating	
	No Chance or Very Little Chance	Some Chance or Very Good Chance
Expected college events		
Work full-time	62.3	49.5
Marry while in college	60.1	54.8
Need extra time for degree	58.4	59.8
Join fraternity or sorority	60.2	57.8
Graduate with honors	*53.7*	*60.8*
Be elected to student office	*61.9*	*51.4*
Play varsity athletics	*60.4*	*55.5*
Take part in student protests	*60.1*	*57.0*
Drop out temporarily	*60.5*	*25.0*
Transfer to another college	*63.0*	*50.8*
Seek personal counseling	*61.7*	*53.5*

Discussion

It was hardly surprising that commuters in our fall 1997 entering cohort persisted to the six-year follow-up less often than both groups of residents. True, these commuters were more predominantly Caucasian and female than both groups of residents and were more often attending their first-choice institution – trends strongly associated with increased persistence (Pascarella & Terenzini, 1991). Nonetheless, commuters tended to come from less affluent backgrounds and their academic credentials did not compare favorably to those of WNY residents. These socioeconomic and academic differences did not wholly explain the differences in retention between the commuter and resident groups, as the impact of commuter status remained even when we controlled for all demographics and academic achievement variables.

The three residential groups differed dramatically on several pre-enrollment attitudinal indicators. The non-WNY residents clearly were the most socially oriented of the groups. Their college choice was often based on considerations that might improve their social lives, and their goals for their college and postgraduate lives typically reflected social motivations.

WNY residents appeared to retain the most traditionally academic approaches to college and to life. They were more oriented toward achievement (e.g., authority in their chosen area; contribution to science; honor society membership) and cultural pursuits (e.g., creating artistic work; developing a meaningful life philosophy) than others. Their profile was that of a group that enjoyed learning for its own sake, rather than as a means of achieving power or security.

Commuters were the most pragmatic of the three groups. They most often expected to juggle occupational and familial responsibilities while in college and typically endorsed financial aspects of a college education as critical to their decision to enroll. Though often necessary, these attitudes are not conducive to student integration. While non-WNY residents appeared predisposed to the highest levels of social integration and WNY residents were likely to be more academically integrated, commuters were less apt to become integrated in either fashion. Commuters also faced competing demands that did not strongly impact other students. When commuters saw transfer to another institution as unlikely, that expectation may have been due more to these external demands – particularly those binding them to the local area – than it was to integration.

Commuters' lesser interest in social and intellectual aspects of college life, which preceded matriculation and their on-campus counterparts' residential experiences, apparently inhibited retention. Commuters who were less interested in cultural pursuits or the traditional features of a liberal education persisted at a lesser rate. Although immersion in some campus social activities (e.g., Greek letter organizations; student government; student protests) is not necessarily beneficial to the long-term academic progress of commuters, some interest in the campus environment seems necessary for adequate integration.

Recommendations

When commuters are not well integrated into the campus culture, administrators may wish to create new ways of slowly introducing traditional academic values while not alienating commuters with different baseline concerns. Programs should optimally indicate movement toward a model of equitable experience for commuters and residents (Jacoby, 2000b), with separate commuter-oriented programs serving as a stopgap measure rather than an endpoint:

- increase the convenience, flexibility, and inclusiveness of orientation activities; orientation might focus increasingly on institutional features that are not part of the commuter's usual culture (e.g., liberal education; on-campus organizations)

- create centrally located on-campus learning centers that encourage commuters to connect with each other and with residents while at the university
- develop commuter-oriented social groups and e-lists that can focus on common concerns (e.g., balancing work and school; applying academic materials in the workplace; child care)
- implement block course scheduling and evening classes that do not conflict with competing activities
- incorporate applied and interactive elements, in keeping with commuters' more practical approach, into curricula

Competing demands on commuters in our sample are likely to further hinder their ability to persist and to graduate. Commuters who expected to get a full-time job to help pay expenses were substantially less likely to persist, as might be expected from the copious research demonstrating a negative relationship between employment and persistence in the general college-going population (Pascarella & Terenzini, 1991). Commitment to marriage also diminished students' chances of persisting. The competing demands of presumably off-campus employment and marriage have been shown to reduce students' academic and social integration on other campuses. These demands exert a negative influence on persistence that precedes and is independent of the socializing influence of dorm life on residents.

Nonetheless, the financial issues faced by many commuters constitute a hurdle that is difficult to negotiate. More students are finding it difficult or impossible to pay for college with personal or family resources (St. John, Hu, & Tuttle, 2000). Simultaneously, budgets have become tighter at public institutions across the nation and institutional scholarship money has become scarcer. Increasing financial aid for middle-income students is simply not an option in most cases. Nonetheless, some of the following policies may ameliorate financial concerns:

- increase the prominence of financial benefits (e.g., low tuition investment; long-term monetary rewards of higher education) in local marketing
- expand marketing to be inclusive of parents and other family members who may have a financial stake in college decisions and who are likely to influence decisions whether or not to attend college in the first place
- increase the prominence of any scholarships and grants available to students not eligible for need-based financial aid via campus literature

Conclusion

We cannot increase retention among commuters by teaching them to be more like on-campus residents. They are unique. In order to sufficiently fulfill commuter needs in order to retain them, we would do well to address common concerns that impede student integration and increase competing demands. These proactive measures, however, are no substitute for aggressive student advisement policies. When commuters find themselves in academic difficulty, they are not likely to move to another institution but may struggle

on their own until the situation is dire. We must be proactive if we wish to reach and retain our commuter students as well as our residents. Such an approach provides us with the best opportunity to moderate the impact of behavior that diminishes academic success among commuters.

References

Anderson, N. & Graser, C. (1976). An information integration analysis of attitude change in group discussion. *Journal of Personality and Social Psychology*, *62*, 35-50.

Bean, J. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education*, *12*, 155-187.

Bean, J.(1985). Interaction effects based on class level in an explanatory model of college student dropout syndrome. *American Educational Research Journal*, *22*, 35-64.

Cabrera, A., Castaneda, M., Nora, A., & Hengstler, D. (1992). The convergence between two theories of college persistence. *Journal of Higher Education*, *63*, 143-164.

Christie, N. & Dinham, S. (1991). Institutional and external influences on social integration in the freshman year. *Journal of Higher Education*, *62*, 412-436.

Finn, J. & Voelkl, K. (1993). School characteristics related to student engagement. *Journal of Negro Education*, *62*, 249-268.

Horn, L, & Berktold, J. (1998). *Profile of Undergraduates in U.S. Postsecondary Education Institutions: 1995-96 (NCES 98-084).* Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Jacoby, B. (2000a). Why involve commuter students in learning? *New Directions for Higher Education*, *109*, 3-12.

Jacoby, B. (2000b). Involving commuter students in learning: Moving from rhetoric to reality. *New Directions for Higher Education*, *109*, 81-87.

Pascarella, E. & Terenzini, P. (1991). *How college affects students*. San Francisco: Jossey-Bass.

St. John, E., Hu, S., & Tuttle, T. (2000). Persistence by undergraduates in an urban public university: Understanding the effects of financial aid. *Journal of Student Financial Aid*, *30*, 23-37.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Educational Research*, *45*, 89-125.

Wittkopf, B. (1994) Accommodating commuter students – the majority! *Research Strategies*, *12*, 2-3.

WHO ATTAINS A BACHELOR'S DEGREE IN FOUR YEARS? EXPLORING THE TIME-TO-DEGREE IN PUBLIC 4-YEAR COLLEGES

Lillian Zhu
Director of Institutional Research
SUNY College at Brockport

Introduction

Time-to-degree has been an important policy issue for years and it gets increasing attention for good reasons. For college and university faculty and student affairs officers, the degree attainment signifies the success of their work with students (Astin & Oseguera, 2002). For college and university administrators, timely graduate the current students allow the institution to better accommodate the new entering class. It certainly releases the pressure of the draining resources and the prospect of continuing enrollment growth. A time-to-degree study conducted at UC Berkeley (Nerad, 1991) and the investigation of pending student growth referred as Tidal Wave II (Hunter, 2000) are such concerns. For students, who constantly weigh their investment of paying the 'opportunity costs' of college education against the economic benefits that may accrue from a bachelor's degree (Tinto, 1987), earlier graduation means earlier realization of their investment return.

Timely graduation is also considered as a key social asset. The society will be better off with college-educated citizen by collecting more tax revenues, spending less on social welfare, and dealing with fewer crimes. College graduates' spouses are often well educated too. Their children usually do better in schools and less likely get into troubles with the police (Jencks & Edlin, 1995; Murphy & Welch, 1993). Moreover, as reported by U.S. Census Bureau, an educated population is more likely to take its civic responsibilities, such as voting and volunteering (2000b).

Despite the obvious reward and social benefit, however, timely graduation from U.S. colleges and universities is far from certain (DeBrock, Hendricks, & Koenker, 1996). Students who matriculate to higher education institutions do not always graduate (Bradford & Farris, 1991). In public four-year colleges nationwide, less than a quarter of the college students, on average, graduated in four years, and a little over half (51.9%) obtained a bachelor degree in six years (Astin & Oseguera, 2002). Unhappy with the lower productivity in higher education, Virginia state legislature tried to tie institutional funding to the graduation rate (Hebel, 1999). Colleges and universities, on the other hand, consider the graduation rate as one of the institutional effectiveness measures or one of the key performance indicators.

The lower graduation rate and prolonged degree completion have disappointed many, from policy makers to student's parents. As part of the effort to make change, we have to know why some can graduate, and sooner, while others cannot. This study intends to exam the students who can timely attain their degree from public four-year colleges with respect to

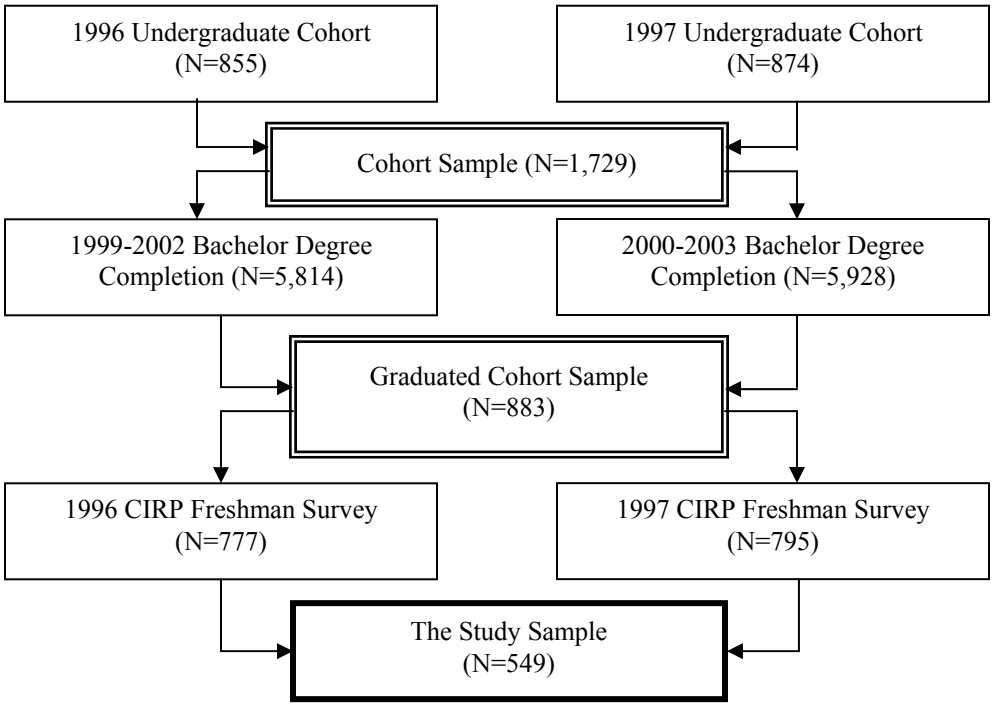
their college preparation, academic performance, time management, financial support, and demographics. Using a first-time, full-time, and degree-seeking freshman cohort population, the study focus on the group of students who are considered as having the best chance to graduate on time. The purpose is to identify the factors that are significantly related to the degree completion within four, five, or six years, in a public four-year college in the Northeast region.

Methodology

Data Sources and Sample

The sample of the study was generated from two data files, the 1996 and 1997 freshman cohorts, to ensure a sizable sample. The two cohorts are the most recent entering classes from which the six-year graduate data can be collected. The subjects were the first-time and full-time undergraduate students who entered the college in fall 1996 or 1997. To serve the purpose of this study, the sample was further categorized in three different tiers. Chart 1 below illustrates the process of the sampling.

Chart 1 Sampling Procedure and Sample Formation



The size of joint cohort population was 1,729. A descriptive analysis was performed to verify if the two cohorts were alike regarding the major demographic variables (Chart 2).

Chart 2 Comparing Entering Cohorts, 1996 and 1997		
	1996 Cohort (N=885)	1997 Cohort (N=874)
Female	52%	51%
Caucasian	90%	90%
Pursuing BA Degree	88%	91%
Graduate by 4-Year	24.3%	24.5%
Cumulative Graduation by 5-Year	45.8%	44.6%
Cumulative Graduation by 6-Year	50.3%	50.1%
GPA by Graduation	2.93	2.97

To examine the graduation status and the time to obtain a bachelor degree, the cohort sample was then merged with the degree completion database for both 1996 and 1997's entering classes. The cohort subjects from either 1996 or 1997 classes who graduated by the end of the sixth year from the college were selected to form a graduated cohort sample. The graduated cohort sample has a size of 883 and holds a 6-year graduation rate of 51.2%, which is aligned with the national study of college completion (Astin & Oseguera, 2002).

The college in the study has participated the CIRP Freshman Survey since 1968. All the cohort members were expected to response to the survey. This study includes some unique variables, such as time management in higher school, college expectation, etc. from the CIRP Survey. As a result, not only it was able to expand the scope and enrich the depth of the study, but also allowed us to assess the impact of the subject's attitude and competency to the time-to-degree. After the graduated cohort sample was further merged with both the 1996 and 1997 CIRP Freshman Survey data, the study ended up with a sample of 549 subjects. The reduction of the sample size is due to the limited availability of the social security numbers on CIRP data files, which is the key for the data merge.

To sum up, the study sample was made up by the subjects who (1) entered the College in either 1996 or 1997 as a full-time and first-time undergraduate student, and (2) graduated within six years from the College, and (3) participated CIRP Survey in the College Freshman Orientation.

Measurement and Sample Description

Since the study involved multiple data files ranging from cohort to degree completion, a consolidation of the variable categories was performed as part of the descriptive analyses. This section details the variable measurement from CIRP (Chart 4 later) and the sample description (Chart 3) at two levels: (1) graduated cohort (N=883), and (2) study sample (N=549).

The Graduate Cohort Level

The *time-to-degree* was defined by the number of academic years spent between the time of entering college and of the degree completion. As Table 1 indicates, close to 50% (429 out of 883) of the graduated subjects at this sample level obtained their Baccalaureate degree by the end of fourth college year. Another 40% plus completed their undergraduate programs within five years. There is a little difference between the graduation rates of 1996 and 1997 cohorts.

Table 1. Graduation Status by Time-To-Degree

	Graduate by 4-year	Graduate by 5-year	Graduate by 6-year
Graduated 1996 Cohort	215 (24.3%)	190 (21.5%)	40 (4.5%)
Graduated 1997 Cohort	214 (24.2%)	176 (19.9%)	48 (5.4%)
Total	429 (48.6%)	366 (41.4%)	88 (10%)

The *gender* and *ethnicity* distributions among the graduated cohort subjects are displayed. As seen in Table 2, the number of females by the time-to-degree was significantly higher than that of their male counterparts. Among the 883 graduated cohorts, 518 were females (58.7%). By four-year graduation, the number of females was more than doubled of the males. As for the graduation by ethnicity, white clearly dominated each of the time length categories.

Table 2. Gender and Ethnicity by Time-To-Degree

	Graduate by 4-year	Graduate by 5-year	Graduate by 6-year
Gender			
Female	290 (32.8%)	198 (22.4%)	30 (3.4%)
Male	139 (15.7%)	168 (19.0%)	58 (6.6%)
Ethnicity			
White	407 (46.1%)	335 (37.9%)	77 (8.7%)
Black	9 (1.02%)	11 (1.25%)	9 (1.02%)
Hispanic	7 (.79%)	5 (.57%)	2 (.23%)
Asian	3 (.34%)	3 (.34%)	0 (0%)
Ame. Ind.	3 (.34%)	1 (.11%)	0 (0%)
Total	429 (48.6%)	366 (41.4%)	88 (10%)

The Study Sample Level

At this level, the sample size was smaller (N=549), but the number of variables was increased due to the incorporation of CIRP data. Cautions have to be taken when interpret the CIRP data because of its self-reporting nature. Moreover, the study reviewed basic

demographics of the study sample to assess its representativeness of the graduate cohort sample (see Chart 3). The measurement of the selected CIRP variables is listed in Chart 4.

Chart 3 Study Sample as a Subset of Graduate Cohorts

	Graduate Cohort Sample (N=885)	Study Sample (N=549)
Female	58.6%	61.0%
Caucasian	92.7%	93.4%
GPA at Graduation	2.95	2.96
Total Credit Hour for Degree	126.8	123.0

Chart 4 Measurement of Selected CIRP Variables

HSAVG (high school GPA)	1=D, 2=C, 3=C+, 4=B-, 5=B, 6=B+, 7=A-, 8=A
FATHEDT (father education level)	1=grammar school, 2=some high school., 3=h.s. grad. 4=postsecondary other than college, 5=some coll. 6=college degree, 7=some grad. school, 8=grad degree
HRPWSTD (weekly hour of study)	1=0; 2=<1; 3=1-2; 4=3-5; 5=6-10; 6=11-15; 7=16-20
EXTRTIME (extra time to grad.)	1=no chance, 2=little, 3=some, 4=very good chance
TEMPDROP (temporary dropout)	1=no chance, 2=little, 3=some, 4=very good chance
MATHABLT (math ability)	1=lowest 10%, 2=below average, 3=average, 4=above average, 5=highest 10%
SELFCNFD (self-confidence)	1=lowest 10%, 2=below average, 3=average, 4=above average, 5=highest 10%

Data from the study also indicated that 98% of the subjects in the study sample were in-state students. The average income of their parents was between $45,000 to $50,000. The fathers' mean education level was 'some college'. The subjects spent an average of 3-5 hours studying and 6-10 hours on paid work per week while in higher schools. About 85% of the subjects reported to have some or good chance to work for pay while in college. Over 70% of them considered bachelor degree as the highest degree to pursue, and another 23% planned to seek a master degree. About half of the subjects thought that there was *no chance* or *little chance* that they needed extra time to get graduated. Only about four percent claimed that they might temporarily drop out of the school.

Table 3 introduces more aggregated sample description by the time to complete bachelor degree. There were more A-students who graduated within four years than that in five or more years. So did B-students. The average SAT score (math and verbal) for the sample was 1,025. Regarding the number of years that the subjects studied either English and/or mathematics, there was no statistical significant difference among the groups with different time lengths of graduation. The self-rated traits on math ability and writing ability

(not in Table 3) indicates low correlation between the number of years spent on studying both subjects and time-to-degree. Approximately half of the subjects thought that they might obtain their bachelor degree in 4-years and another 40% said that they could make it within 5 years.

Table 3. Study Sample Description by Time-To-Degree

	Graduate by 4-year	Graduate by 5-year	Graduate by 6-year
High School Average			
A	75 (13.7%)	28 (5.1%)	5 (0.9%)
B	185 (33.7%)	175 (31.9%)	37 (6.7%)
C	11 (2.0%)	25 (4.6%)	5 (0.9%)
# of Years Studying English			
One or less	141 (25.7%)	110 (20.8%)	26 (4.7%)
Between 2-4	126 (23.0%)	115 (20.9%)	18 (3.3%)
Five and more	5 (0.9%)	4 (0.7%)	3 (0.6%)
# of Years Studying Math			
One or less	145 (26.4%)	110 (20.0%)	27 (4.9%)
Between 2-4	120 (21.9%)	112 (24.4%)	19 (3.5%)
Five and more	6 (1.1%)	4 (0.7%)	1 (0.2%)
Get Bachelor's Degree			
No or little chance	6 (1.1%)	9 (1.7%)	4 (0.7%)
Some or good chance	59 (48.3%)	59 (39.5%)	41 (7.6%)

Analysis and Results

Descriptive Analysis

A Chi Square analysis was applied to the study sample to see if any factors have significant impact on the time-to-degree. This additional descriptive analysis focused on the variables that were related to the number of matriculated semesters, the finance of college, and the competency of timely graduation.

The number of semesters from the matriculation through the graduation was analyzed to see if there were excessive lengths caused by part-time enrollment or by repeating failed course(s). The measurement of the variable is the count of the consecutive fall and spring semesters enrolled (Table 4). Many subjects (45.6%) spent eight semesters after matriculation completing their bachelor degrees in four years, and 37% plus spent nine or ten semesters before graduation. If the summer semester(s) or the semester(s) prior to matriculation were included in the calculation, the number of enrolled semesters would have been greater. For the 28 subjects who studied eight semesters after matriculation but graduated by five years, they were more likely being non-matriculated for a few semesters. So were the 12 in the 6-year graduation group.

Table 4. Number of Matriculated Semesters in Degree Program

	Graduate by 4-year***	by 5-year***	by 6-year***
6 Semesters	7 (1.3%)	0	0
7 Semesters	15 (2.7%)	0	0
8 Semesters	249 (45.6%)	28 (5.1%)	0
9 Semesters	0	107 (19.6%)	0
10 Semesters	0	93 (17.0%)	12 (2.2%)
11 Semesters	0	0	23 (4.2%)
12 Semesters	0	0	12 (2.2%)

* p<.05, ** p<.01, *** p<.001

Various financial aid sources were grouped and re-coded into dummy variables as family support, grants, job-pays, loans, and savings regardless of the dollar amount. *Concern about college financing* was a categorical variable reported by the subjects to rank their financial difficulty at three levels, namely *none, some*, or *major* (Table 5). Family support and savings were the top financial resources for completing the college by all three groups. Not mutually exclusive, among those who expressed concern of college financing, 87% got family support, 80% had savings, 67% borrowed loan(s), 56% worked for pay, and 52% received various amount of grant. There was no significant relationship between the time-to-degree and type of financial aids except the impact of *savings* on the six-year graduation.

Table 5. Received Financial Aids by Time-To-Degree

	Graduate by 4-year	by 5-year	by 6-year
Family Support	246 (44.9%)	195 (35.5%)	39 (7.1%)
Grant	129 (23.5%)	119 (21.7%)	21 (3.8%)
Job Pay	141 (25.7%)	112 (20.4%)	28 (5.1%)
Loan	160 (29.1%)	144 (26.2%)	26 (4.7%)
Savings	218 (39.7%)	177 (32.2%)	31 (5.7%)*
Financial Concern			
None	59 (10.9%)	59 (10.9%)	15 (2.8%)
Some	172 (31.8%)	136 (25.2%)	26 (4.8%)
Major	38 (7.0%)	31 (5.7%)	4 (0.7%)

p<.05, ** p<.01, *** p<.001

A series of self-rated traits, such as *academic ability*, *drive to achieve*, *mathematical ability*, *writing ability*, and *intellectual self-confidence* were also studied (Table 6). The *academic ability* was found significantly related to the graduation by four or five years. There were more subjects at the average level of academic ability graduated by four years than those by five years. For variables *drive to achieve,* and *math* and *writing ability*, subjects who held above average level or at the highest 10% graduated with fewer years than those at the average level. A look at *Intellectual self-confidence* showed that it has a

significant relationship with the time-to-degree. Besides, there were more subjects at average self-confidence level graduated by each of the graduation lengths than those reported at above average or the highest 10% levels.

Table 6. Self-rated Traits by Time-To-Degree

	Graduate by 4-year	by 5-year	by 6-year
Academic ability	**	**	
Average	130 (23.7%)	145 (26.5%)	24 (4.4%)
Above average	119 (21.7%)	70 (12.8%)	17 (3.1%)
Highest 10%	21 (3.8%)	8 (1.5%)	3 (0.6%)
Drive to achieve			
Average	102 (18.6%)	97 (17.7%)	13 (2.4%)
Above average	124 (22.6%)	88 (16.1%)	18 (3.3%)
Highest 10%	43 (7.9%)	40 (7.3%)	13 (2.4%)
Mathematical ability			
Average	111 (20.3%)	101 (18.4%)	21 (3.8%)
Above average	60 (11.0%)	54 (9.9%)	12 (2.2%)
Highest 10%	18 (3.3%)	8 (1.5%)	6 (1.1%)
Writing ability			
Average	142 (26.0%)	113 (20.7%)	27 (4.9%)
Above average	79 (14.4%)	64 (11.7%)	6 (1.1%)
Highest 10%	15 (2.7%)	20 (3.7%)	5 (0.9%)
Self confidence	**	**	*
Average	137 (25.1%)	128 (23.4%)	20 (3.7%)
Above average	90 (16.5%)	49 (9.0%)	15 (2.7%)
Highest 10%	18 (3.3%)	25 (4.6%)	10 (1.8%)

p<.05, ** p<.01, *** p<.001

Model Test

The test of a statistic model identifies the significant factors that affect the time-to-degree. Due to the dichotomous nature of the dependent variable as graduated or not graduated by different time length, logistic model was chosen. Before the model test, a massive Pearson correlation analysis was performed. Variables that have more than .20 correlation coefficients were eliminated from entering the model to prevent co-linearity. Then, three sub-models were built upon an identical set of independent variables. The dependent variable about the time to bachelor degree completion varied from four to six years. The test results are reported on Table 7 to 9.

It is seen from Table 7 that *High school average* (HSAVG) had a positive and statistically significant impact on the four-year graduation. Therefore, the higher the HGAVG, the better the chances for students to earn their bachelor degrees within four years.

The odds ratio of 1.412 implied that when the HGAVG was one level higher (e.g. from *B*+ to *A*-), the student was 1.4 times more likely to graduate by the end of the fourth year. The *education level* of subject's father (FATHEDU) was another factor significantly related to the four-year degree. The higher the FATHEDU the more likely the student would obtain the bachelor degree in four years. When the father's education was one level higher (e.g. from *some college* to *college degree*), the student's chance of graduation in four years increased by 17%. *Number of hours per week spent on study* (HRPWSTD) was another positive and significant factor for four-year graduation. The more hours spent on study implied a possibly better preparation and a more positive attitude towards the schoolwork. The chances for these students to graduate sooner (in four years) was about 1.2 time better than that of their counterparts. Lastly, *Temporary dropout* (TEMPDROP) was found negatively but significantly related to the dependent variable.

Table 7. Factors Impact Four-Year to Bachelor Degree (N=549)

Variable	Parameter Estimate	Wald χ^2	Odds Ratio
Intercept			
High School GPA	0.3449	19.3012***	1.412
Math Ability	-0.1555	2.1764	0.856
Intellectual Self-confidence	-0.1033	0.7645	0.902
Father Education Level	0.1606	10.2241**	1.174
Finance College	0.2784	3.1700	1.321
Weekly Study Hours	0.1508	3.9573*	1.163
Temporary Drop	-0.3455	4.2068*	0.708
Model χ^2		42.8588***	
d.f.		7	

$p < .05$*, $p < .01$**, $p < .001$***

For the five-year graduation group, HSAVG was significantly but negatively related with the dependent variable (Table 8). Its odds ratio indicated that when HSAVG was one level higher, the chance of graduation by five-year would be reduced to 75%. FATHEDU was also significantly but negatively related with the five-year-to degree. These two outcomes suggest that the subjects with better HSAVG and whose father was better educated could have graduated in less than five years.

Self-rated math ability was found positively and significantly related to the dependent variable, namely six-year-to-degree (Table 9). The higher math ability implied an increased likelihood to eventually graduate in six years. With relatively better math ability, the odds increased by 50% for a subject to graduate by sixth year. Intellectual self-confidence was also positively and significantly related to the six-year graduation. When the self-confidence level increased by one level, the chances to graduate by the end of sixth year would increase by 87%. Moreover, TEMPDROP was seen positively and significantly related to the

dependent variable. The TEMPDROP could cause as many as double of the chances (odds ratio = 2.098) for a student not to graduate earlier.

Table 8. Factors Impact Five-Year to Bachelor Degree (N=549)

Variable	Parameter Estimate	Wald χ^2	Odds Ratio
Intercept			
High School GPA	-0.2882	14.2576***	0.750
Math Ability	0.0246	0.0547	1.025
Intellectual Self-confidence	-0.1169	1.0005	0.890
Father Education Level	-0.1338	7.2518**	0.875
Finance College	-0.1226	0.6298	0.885
Weekly Study Hours	-0.0671	0.7800	0.935
Temporary Drop	0.0882	0.2869	1.092
Model χ^2		28.2104***	
d.f.		7	

p < .05*, p < .01**, p < .001***

Table 9. Factors Impact Six-Year to Bachelor Degree (N=549)

Variable	Parameter Estimate	Wald □^{2}	Odds Ratio
Intercept			
High School GPA	-0.1385	1.2171	0.871
Math Ability	0.4114	4.6103*	1.509
Intellectual Self-confidence	0.6284	9.5997**	1.875
Father Education Level	-0.0873	0.9610	0.916
Finance College	-0.4629	2.7907	0.629
Weekly Study Hours	-0.2526	3.1848	0.777
Temporary Drop	0.7408	7.4341**	2.098
Model □^{2}		28.2923***	
d.f.		7	

p < .05*, p < .01**, p < .001***

The study also attempted alternative model test, e.g. to group the five-year and six-year graduates together as a sub-group of graduated beyond four years. However, no significant differences were found between the models reported in this paper and the alternative test. The significant factors remain.

Discussion and Implication

In summary, the three logistic model tests have identified factors that contributed to the four-year, five-year, and six-year graduation. A student graduated from the college within four years was more likely to be the one who had better high school GPA, whose father's education level was somewhat higher, who spent more hours per week on studying, and who was unlikely to stop out the college temporarily. For a student who obtained a bachelor degree in five years, his/her high school GPA was not that good and the father's education level might not positively contribute to his/her graduation. For a student who was eventually able to graduate from the College by the end of the sixth year, his/her intellectual self-confidence and math ability were likely the positive contributors of the degree completion and whose delayed graduation was more likely caused by the temporary drop out.

As the results indicate, high school GPA is a positive contributor of the time-to-degree and indicates a student's level of preparation for the post-secondary education. Literature has accumulated evidences that lack of sufficient preparation in high school would likely to cause failure in college persistence and graduation, including not being able to timely graduate (Adelman, 1999; Cabrera, Nora, & Castaneda, 1993; Pascarella & Terezini, 1991). Although combined with SAT scores, the high school GPA is used extensively by the college as a selectivity criterion, studying high school performance in depth is a sure way to get better college preparation measurement. The proposed new SAT test is another positive approach to watch for. It not only helps improve the measurement of high school performance but also more importantly pushes the reform of the high school curriculum to send well-prepared students to college.

The adjustment of college life was essential to most new students who participated the Freshmen Survey. Reporting the weekly hour spent on study is, hopefully, an initial step towards a commitment of fostering a good time management skill, especially when the students are involved in various extracurricular activities. The number of hours spent on study is also tied up with many other factors such as college goal, performance expectation, studying habit, etc. Therefore, the college counseling staff, advisement personnel, and the faculty should pay more attention to this indicator.

When a student is from a family with well-educated parents, s/he may have seen the evidence that a college degree promotes a higher social and economic status. For some students, they may even benefit directly from the academic advice given by their parents. For the first generation college students, they had worked harder than their peers to be the college students. Therefore, they may more appreciate the opportunity to study in college. As for a college, it should reinforce its mission as student's success. It should also timely

address students' personal and academic concerns on their way to a prosperous college degree completion.

From a student's point of view, the sooner s/he completes the degree, the less the opportunity cost s/he pays. However, the time-to-degree is a complex matter and is closely related to many factors ranging from job market, financial needs, availability of the courses, to eventually meeting the academic requirements including retaking courses. Also, many researchers have argued that those who fail to graduate may merely have made an economic choice: "Each student must determine if the value of completing the degree makes persistence rational" (DeBrock et al., 1996, p.520; DesJardins, Ahlburg, & McCall, 2002). For many students, time-to-degree stands for the self-esteem and actualization. To college, time-to-degree is more a performance indicator and a goal of the college strategic planning. It involves carefully evaluating institutional policies and building up cooperation among faculty, staff, administrators and students. No effort is too much for this subject.

Future Study

The logistic models employed by the study were based on the assumption that the effects of interval-level predictors were all linear. The inclusion of ordinal/categorical measure for numerical variables such as family income and/or parents' education could challenge the assumption. It would be interesting to know what may be found if this assumption is removed and nonlinear model test is performed.

Finally, the effect of weekly hours for study on time-to-degree raises a few follow-up questions. How many hours on average do students spend on paid jobs? Is the work for pay a positive factor to motivate students to graduate sooner? To what extent does it reflect the financial burden a student has to deal with beyond the schoolwork? Besides, more financial aid variables should be included to explore the tuition hike on time-to-degree in future study.

Reference

Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns, and bachelor's degree attainment*. Jessup, MD: Education Publications Center, US Department of Education.

Astin, A.W. & Oseguera, L. (2002). *Degree attainment rates at American colleges and universities.* Los Angeles: Higher Education Research Institute, UCLA.

Bradford, C., & Garris, E. (1991). *Survey on retention at higher education institutions: higher education surveys report*. Rockville, MD: Westat.

Cabrera, A. F., Nora, A. and M. B. Castaneda (1993). College persistence: Structural equations modeling test of an integrated model of student retention. *Journal of Higher Education, 64*,123-139.

Debrock, L., Hendr.icks, W., & Koenker, R. (1996). The economics of persistence:

Graduation rates of athletes as labor market choice. *Journal of Human Resources*, *31*, 513-539.

DesJardins, S., Ahlburg, D., & McCall, P. (2002). A temporal investigation of factors related to timely degree completion. *The Journal of Higher Education, 73*(5), 555-581.

Hebel, S. (1999, May 28). Virginia Board wants to link state aid to colleges to their performance in key areas. *The Chronicle of Higher Education*, p. A33.

Hunter, L. (2000). *Considering enrollment in the construction equation Tidal Wave II may not be driving campus construction but will impact the approach to these efforts*. Retrieved from Berkeley Web site: http://www.berkeley.edu/news/extras/renew/2000/fall_tidal.hrml

Jencks, C. & Edlin, K. (1995). Do poor women have a right to bear children? *The American Prospect, 20*, 43-52.

Murphy, K. & Welch, F. (1993). Inequality and relative wages. *American Economic Review, 83*, 104-109.

Nerad, M. (1991). Graduate education at the University of Califonia and factors affect time-to-degree. Retrieved from University of California Santa Barbara Web site: www.graddiv.ucsb.edu/academic/advice/importance.shtml

Pascarella, E. T., and Terenzini, P.T. (1991). *How college affects students – Findings and insights from twenty years of research.* San Francisco: Jossey-Bass.

Tinto, V. (1987). *Leaving college: Rethinking the causes and cures of student attrition.* Chicago: University of Chicago Press.

U.S. Census Bureau. (2000a). *Educational attainment in the United States. Current population reports*. Retrieved from http://www.census.gov/prod/2000pubs/p20-528.pdf

U.S. Census Bureau. (2000b). *Voting and registration in the election of November 1998. Current population reports*. Retrieved from http://www.census.gov/prod/2000pubs/p20-523.pdf

Saturday, November 15, 2003	
12:30 – 5:30 pm *East Foyer – Registration Desk*	**Conference Registration**
1:00 - 4:00 pm *Columbia Room* **James F. Trainer** Director of Planning and Assessment Villanova University **Gayle Fink** Director of Planning, Research and Evaluation Community Colleges of Baltimore County **Michelle Appel** Research Analyst University of Maryland	**Newcomers to Institutional Research (Part I)** This workshop introduces new practitioners to key components of institutional research including: defining issues; identifying sources of data; developing reports; responding to various requests; and conducting assessments/evaluations. The presenters are a team of experienced professionals representing various sectors of higher education (e.g., public, private; 2-yr, 4-yr; research, comprehensive and community college) who will provide opportunities for engagement both within and across sectors. Pre-conference Workshop
1:00 - 4:00 pm *Enterprise Room* **David Brodigan** Director of Institutional Research Williams College	**Conducting and Applying Market Research for Student Recruitment** The chances of success in student recruitment increase greatly when a full, creative, and inventive marketing research program is in place. While the analytic techniques well suited for the tasks of differentiating market segments, finding new markets, setting prices appropriately, and the like, are a major focus of this workshop, practical matters such as customizing questions for marketing surveys, sampling from prospective student populations, and choosing among survey and interview approaches will be hands-on topics. Pre-conference Workshop
1:00 - 4:00 pm *Freedom Room* **Mary Ann Coughlin** Assistant to the Provost, VP for Academic Affairs Springfield College	**Statistics for Institutional Research** Basic ideas in statistics will be covered in a way that is useful as an introduction or refresher to statistics. Descriptive statistics, sampling and probability theory as well as the inferential methods of chi-square, t-test and Pearson's r will be covered. Pre-conference Workshop
1:00 - 4:00 pm *Salve Regina University* **Manish Sharma** Institutional Research Analyst University of Connecticut	**Excel Visual Basic (VBA) Programming (Hands On Workshop)** The workshop is designed to enhance the Excel reporting capabilities of participants. Hands-on exercises are used to write Visual Basic code to generate summary reports. Creation and application of custom user interfaces to produce reports will be explored. User interfaces afford greater flexibility and enhance overall efficiency of the application. Note: Participants are expected to be basic users of VBA or of other programming languages. Pre-conference Workshop

Saturday, November 15, 2003 (continued)	
4:00 - 5:00 pm *Columbia Room* **Sandra J. Price** Chair, NEAIR Mentor and Newcomer Committee **Becky Brodigan** President, NEAIR Director, Institutional Research & Analysis Middlebury College **Richard C. Heck** Director of Alumni and Parent Relations Binghamton University	**2003-04 Mentor Program Participants Meeting** This is an opportunity for mentors and mentees to meet at the beginning of the conference, before the Welcome Reception. It is also an important opportunity to learn about the mentor program and about what constitutes a successful mentor/mentee relationship from experienced IR mentors. Our president, Becky Brodigan, and Richard Heck, long-time NEAIR member, will say a few words about mentoring. For more information about the NEAIR Mentor Program, go to http://www.neair.org/AboutNEAIR.ASP and click on the Mentor Program link. If you are interested in participating in this program, please check the box on the Conference Registration Form or the Membership Form and the Mentor Program Committee will contact you. Special Session
5:00 – 6:30 pm *Hotel Atrium*	**Welcome Reception**
7:00 pm - ? *Sign-up, menus, and host introductions at Welcome Reception*	**Saturday Evening Dinner Groups** Immediately after the Welcome Reception, join a local NEAIR member for dinner at one of several Newport restaurants. Use this opportunity to meet new people and sample the best of Newport. Sign-up sheets and menus will be at the Registration Desk all day.
Sunday, November 16, 2003	
8:00 – 4:30 pm *East Foyer – Registration Desk*	**Conference Registration**
9:00 am - noon *Columbia Room* **James F. Trainer** Director of Planning and Assessment Villanova University **Gayle Fink** Director of Planning, Research and Evaluation Community Colleges of Baltimore County **Michelle Appel** Research Analyst University of Maryland	**Newcomers to Institutional Research (Part II)** This workshop introduces new practitioners to key components of institutional research including: defining issues; identifying sources of data; developing reports; responding to various requests; and conducting assessments/evaluations. The presenters are a team of experienced professionals representing various sectors of higher education (e.g., public, private; 2-yr, 4-yr; research, comprehensive and community college) who will provide opportunities for engagement both within and across sectors. Pre-conference Workshop

Sunday, November 16, 2003 (continued)	
9:00 am - noon *Courageous Room* **David X. Cheng** Assistant Dean for Research and Planning Columbia University	**The Focus Group Method and Its Application in Institutional Research** This workshop is designed to provide institutional researchers with a useful tool to supplement and/or support their quantitative research. The instructor of the workshop will explore the techniques, uses, strengths, and limitations of focus group method, emphasizing the hands-on experiences of designing a study, conducting the meetings, and analyzing the results. Pre-conference Workshop
9:00 am - noon *Enterprise Room* **Mitchell Nesler** Assistant Vice President for Academic Affairs Empire State College	**Developing a Systematic Outcomes Assessment Plan** This workshop will assist researchers to develop an outcomes assessment framework for systematic data collection and continuous improvement. A framework for assessing student learning and institutional outcomes will be reviewed. Workshop participants will learn how to adapt this framework to meet the needs of their own campuses. Pre-conference Workshop
9:00 am - noon *Salve Regina University* **Mary Ann Coughlin** Assistant to the Provost, VP for Academic Affairs Springfield College	**Overview, Review, Refresher on the Application of SPSS in Institutional Research** Have you been meaning to use the copy of SPSS that is sitting on your computer? Have you thought about exploring the use of SPSS in your office? This workshop is designed to provide you with a broad overview of how the SPSS software can best be used within your office. The workshop will review the basics of using SPSS as well as some more advanced procedures that can be extremely useful to Institutional Research professionals. The content to be covered includes: reviewing the functions of statistical software, getting data into SPSS, manipulating data, performing file management procedures, selecting the appropriate statistical procedure, displaying data, customizing your output, mastering the Tables procedure and running advanced statistical procedures. This workshop will focus on how to use SPSS and only limited time will be spent on interpretation of statistical output. Pre-conference Workshop
Noon – 5:00 pm *South East Foyer*	**Vendors' Displays**
Noon – 1:30 pm	**Lunch Break**

Sunday, November 16, 2003 (continued)	
1:30 - 4:30 pm *Columbia Room* **James F. Trainer** Director of Planning and Assessment Villanova University **John Kelley** Executive Director, Office of Planning, Training and Institutional Research Villanova University **Michael J. Dooris** Director, Planning Research & Assessment The Pennsylvania State University	**Facilitating the Strategic Planning Process: Important Skills for the IR Professional's Toolkit** Many IR professionals find themselves called upon to support and facilitate a variety of institutional activities including strategic planning. This hands-on workshop will provide an introduction to various strategic planning components, processes and techniques. The focus of the workshop is on readily attainable skills that IR professionals can employ in support of planning, rather than on the theoretical underpinnings of planning. Pre-conference Workshop
1:30 - 4:30 pm *Courageous Room* **Gail Wisan** Director Institutional Research Goucher College	**Creating a Dashboard Indicator for Your Institution** At this workshop, each participant will learn how to create a dashboard for the participant's own institution. In addition, this workshop includes an introduction to different dashboard models. Note: Participants should bring a diskette so that they can take home a modifiable electronic Dashboard Indicators to their own institution. Pre-conference Workshop
1:30 - 4:30 pm *Enterprise Room* **Michelle Appel** Research Analyst University of Maryland	**Institutional Research Office Management Strategies** This session focuses on office management strategies including strategies on how to market your office services to your institution. Topics covered include prioritizing projects, understanding your institutional audience, office staffing and project management databases. Pre-conference Workshop
1:30 - 4:30 pm *Freedom Room* **Eileen M. Doherty** Special Assistant for Financial Analysis Boston College	**Costing and Workflow Analysis for Academic & Administrative Departments** This half-day session will present approaches for academic and administrative department analyses. On the academic side, we will cover collection and sorting of courseload data, derivation of salary allocations, allocation of non-salary expenses, calculation of unit costs, and extension of analysis to include faculty research activities. On the administrative side, we will discuss the development of time and effort surveys, the derivation of salary allocations to functional activities, and the allocation of non-salary expenses. Pre-conference Workshop

Sunday, November 16, 2003 (continued)	
1:30 - 4:30 pm *Salve Regina University* **Lu Phillips** Research Analyst Lorain County Community College	**Practicum in Using the NCES Peer Analysis System (AIR Grant Supported, Hands On)** This practicum is intended both for current users of the web-based NCES Peer Analysis System (PAS) and for those who would like to improve their use of it; some familiarity with PAS is recommended. The practicum will provide hands-on experience focused on three person teams solving real research questions using the IPEDS data available in PAS. Each participant should bring an actual problem from her/his institution and some idea of an appropriate peer group. The workshop will conclude with the teams sharing their research results and commenting on the PAS process. All participants will gain experience using PAS and will have the opportunity to contribute their ideas to ways in which PAS could be improved by NCES. Note: Participants are expected to have walked through the PAS tutorial < http://nces.ed.gov/ipeds/Tutorials/> prior to attending the workshop. Pre-conference Workshop
5:00 – 6:15 pm *Salons II, III & IV* Peggy Williams President Ithaca College 	A World in Need of Leaders Dr. Peggy Williams will discuss some of today's more interesting and provocative theories on leadership. In the process, she will address such fundamental questions as: What is leadership? What is *effective* leadership? Who is a leader? How do today's leaders differ from leaders of past generations? And finally, what characteristics must contemporary leaders exhibit to be effective agents of transformational change? Dr. Williams will also share her experience of the past six years as president of Ithaca College, where she led the campus-wide initiative to create and implement a far-reaching institutional plan…a process that both confirmed and expanded her thinking about leadership. Opening Plenary Session
6:15 – 7:15 pm *Hotel Atrium*	**Reception**
7:15 – 10:00 pm *Salons I, II & III*	**New England Clambake (and Lobsters)!**

NEAIR 30th Annual Conference Program

Monday, November 17, 2003	
7:00 – 8:00 am *Stars & Stripes* C. Anthony Broh Director of Research Consortium on Financing Higher Education	**COFHE Breakfast** By Invitation Only Special Interest Group
8:00 – 4:30 pm *East Foyer – Registration Desk*	**Conference Registration**
8:00 – 4:30 pm *South East Foyer*	**Vendors' Displays**
7:30 – 8:45 am *Salons II, III & IV*	**Continental Breakfast**
8:00 - 8:45 am *Salon I* **Robert J. Morse** Director of Data Research U.S. News & World Report	**What Will the Future Hold for U.S. News & World Report's America's Best Colleges' Rankings?** A discussion of key methodology issues from the ranking published in August 2003. U.S. News will also discuss upcoming publishing plans and methodology and presentation issues that are being discussed for the ranking to be published in 2004. Special Session
9:00 – 10:30 am *Salons II, III & IV* André Bell Vice President for College and Universit Enrollment Services The College Board 	**What Do Senior Administrators Need to Know?** All too often great institutional research is of journal quality but has no impact on the strategic thinking and decisions of institutional leaders or Presidents. Why do IR directors regularly say, ... " if they only knew?" This session will examine the needs, decision-making context and style of college officers with the goal of assisting researchers in being more affective. That is to say, the best research is the stuff that gets read, understood and used. Examples will be used to illustrate and contrast low and high impact IR presentation approaches. Plenary Session
10:30 – 10:45 am *South East Foyer*	**Break**

Monday, November 17, 2003 - Break Out Sessions	
10:50 - 11:30 am *Columbia Room* **Mitchell Nesler** Assistant Vice President for Academic Affairs Empire State College	**What Do Students Expect When it Comes to the Evaluation of Their Work?** A survey of Empire State College enrolled students was developed to determine students' opinions about student evaluation and grading. A total of 416 students responded to a mailed paper and pencil survey, yielding a 52.6% response rate. This research was used to help guide a major policy initiative on campus Contributed Paper
10:50 - 11:30 am *Courageous Room* **Patricia Berrini** Principia Products	**Data Collection Software from Principia Products** Principia will demonstrate our popular Remark Product line for collecting data from paper and/or web-based surveys. Products: Remark Office OMR and Remark Web Survey. Principia is assisting NEAIR in the 2003 conference evaluation. Vendor Showcase
10:50 - 11:30 am *Enterprise Room* **Kit Mahoney** CIRP Survey Coordinator Higher Education Research Institute	HERI – CIRP UCLA's Higher Education Research Institute (HERI) conducts the Cooperative Institutional Research Program (CIRP) – a continuing longitudinal study of the American higher education system whose principal purpose is to assess the effects of college on students. Initiated in 1966, the CIRP Freshman Survey is administered by over 700 institutions across the nation. It provides colleges with information on their entering students, such as demographics, expectations for college, major plans, etc. The new "Your First College Year" (YFCY) survey – the only national survey designed specifically to assess the academic and personal development of students over the first year of college – and the College Student Survey (CSS) enable an institution to track the same cohort of students across their college experience. Participating institutions receive both comparative reports (comparing their students' responses to those of students of similar institutions) and "linked" reports (the same students' responses on the Freshman Survey and either the YFCY or the CSS). This information can be useful for studying retention, understanding students' values, attitudes and goals, and examining specific campus issues. Vendor Showcase
10:50 - 11:30 am *Freedom Room* **Michael E. Whitcomb** Assistant Director, Office of Institutional Research Wesleyan University **Stephen R. Porter** Director, Office of Institutional Research Wesleyan University	**Email Contacts: A Test of Complex Graphical Designs** While HTML email affords researchers many design capabilities, we do not know how the file format and design features of email broadcasts affect survey response. Email contacts for a web survey were experimentally manipulated to test whether email design features impact survey response. Results are discussed in terms of best practices for IR. Contributed Paper

Monday, November 17, 2003 (continued)	
10:50 - 11:30 am *Salon I* **James C. Fergerson** Director Institutional Planning and Analysis Bates College	**Beyond Factbooks - Building an Online Institutional Portfolio** The Bates College Institutional Portfolio provides a structured "gateway" to direct multiple audiences to information reflecting core values, goals, and outcomes. It organizes existing quantitative and qualitative information to support planning, and to provide evidence of institutional effectiveness. This workshare will demonstrate the portfolio and address administrative and technical issues that must be addressed in developing a portfolio. Workshare
10:50 - 11:30 am *Stars & Stripes Room* **Heather Kelly Isaacs** Institutional Research Analyst University of Delaware Michael F. Middaugh Assistant Vice President for Institutional Research and Planning University of Delaware	**Establishing Benchmarks for Out-of-Classroom Faculty Activity: Results of the Expanded Delaware Study's Initial Data Collection** The Delaware Study recently received multi-year funding from the Fund for Improvement of Post Secondary Education (FIPSE) to expand its data collection to incorporate out-of-classroom faculty activity. This paper will describe the data collection, the results, and how the benchmark data may be used to enhance departmental performance. Contributed Paper
10:50 - 11:30 am *Weatherly Room* **Martin Wisniewski** Associate Dean of Technology Cayuga Community College	**Tracking Student Cohorts Using National Student Clearinghouse Data** This session demonstrates a Microsoft Access application developed for Program Assessment using data extracted from an institution's database linked to NSC data to track students by program within class cohorts. The application was designed to be used by those interested in program assessment and provides student detail records for transfer. Workshare
11:40 am - 12:20 pm *Columbia Room* **Kathryn Doherty** Coordinator, Learning Outcomes Assessment Howard Community College	**Beyond the Accountability - Improvement Debate: A Case Study Analysis of Institutional Approach to Effective Assessment** Assessment is primarily characterized by an institution's campus-specific response to internal and external variables that shape assessment policy and practice. Using case study analysis, this study describes the ways in which institutions design, implement and support their assessment programs, and looks at institution-specific factors impacting the assessment mix on campus. Contributed Paper

Monday, November 17, 2003 (continued)	
11:40 am - 12:20 pm *Courageous Room* **Dean Skarlis** ACT	**Recruitment and Retention: Using Institutional Data to Impact Your Enrollment Objectives** IR Professionals and enrollment managers face increasing challenges in today's marketplace. This session will focus on using institutional data, some of which is already available on your campus, to inform decision making and impact your enrollment goals. These data will focus on recruitment and retention and provide specific examples of ways information can transform the ways IR professionals can help drive enrollment decisions. Vendor Showcase
11:40 am - 12:20 pm *Enterprise Room* **Gohar Farahani** Executive Director, Outcome Assessment, Planning and Research Frederick Community College	**Existence and Importance of Online Interaction** This research explored the existence and importance of interaction in online courses as perceived by online learners and instructors. Two web-based surveys were created. The study was based on constructivist theory which suggested that students learn by actively participating in the learning process through interaction with the instructor, other students, and course materials. Contributed Paper
11:40 am - 12:20 pm *Freedom Room* **Rena Cheskis-Gold** Higher Education Consultant Demographic Perspectives **Beth Shepard-Rabadam** Assistant Director, Harvard Planning/Allston Initiative Harvard University **Ruth Loescher** Institutional Research Coordinator Harvard University **Barbara B. Carroll** Director, Office of Instructional Research and Evaluation Harvard University	**Lessons from Recent Web Surveys at Harvard University** This session provides an overview of the entire process necessary to provide support for a university-wide web survey, from the community-building process for creating support for the survey and determining the questions, to the specific tasks necessary for designing and administering an efficient web product. Workshare
11:40 am - 12:20 pm *Salon I* **Ellen Peters** Associate Director for Institutional Research Bates College	**Perceptions and Expectations of the First Year Seminar at Bates College** This workshare will discuss the process and techniques used to determine first year students' perceptions of First Year Seminar program goals at Bates College, and its success in meeting those goals. The project employed qualitative methods to explore the intersection between expectations and experiences of both students and faculty. Workshare

Monday, November 17, 2003 (continued)	
11:40 am - 12:20 pm *Stars & Stripes Room* **Michelle Appel** Research Analyst University of Maryland **Gayle Fink** Director of Planning, Research and Evaluation Community Colleges of Baltimore County **Denise Nadasen** Associate Director, Office of Institutional Research and Planning University of Maryland **Mona Levine** Director of Planning and Institutional Projects Montgomery College	**Echoes from the Boom: The Impact of Population Growth on Maryland Higher Education** Facing budget cuts and burgeoning enrollment demands, members from several Maryland higher education segments collaborated to better understand the expected enrollment demand, access and capacity issues. Ultimately all segments were represented on a workgroup which reported findings to the General Assembly. This presentation outlines the workgroup processes and key findings. Contributed Paper
11:40 am - 12:20 pm *Weatherly Room* **B. Lauren Young** Research Analyst University at Buffalo	**Commuter and Resident Students: Attitudes, Expectations, and Their Influences on Integration and Persistence** The increased persistence among residential students relative to commuters is typically attributed to the transformative, integrative experience of on-campus living. We look back at pre-matriculation differences in attitudes between commuters and residents. Which of these differences independently promote or inhibit persistence, and which hint at a means for retaining commuter? Contributed Paper
12:30 – 1:45 pm *Salons II, III & IV*	**Luncheon and Business Meeting** Announcements, Recognitions & Awards
2:00 - 2:50 pm *Columbia Room* **Mrinal Mugdh** Director of Institutional Research SUNY Empire State College	**Assessing Quality and Efficiency of Individualized Undergraduate Degree Programs: Case of SUNY Empire State College** Since its very inception, Empire State College has adopted principles and models that support non-traditional adult learners. Individualized degree programs at the College focus on experiential learning, personalized teaching-learning process and critical self-reflection. However, the innovative practices also present the challenges of measuring the quality and efficiency of individualized degree programs. The paper discusses how the College has successfully overcome this challenge and ensured educational excellence and efficiency while allowing flexible programs and services suited to the needs of adult learners. Contributed Paper

Monday, November 17, 2003 (continued)	
2:00 - 2:50 pm *Courageous Room* **Pam Gilligan** Director, Northeast Region National Student Clearinghouse	**Using EnrollmentSearch from National Student Clearinghouse** This workshare will demonstrate how to use the EnrollmentSearch tool from the National Student Clearinghouse in institutional research to enhance enrollment management and to track former students. Vendor Showcase
2:00 - 2:50 pm *Enterprise Room* **Jing Su** Programmer Analyst University of Pennsylvania	**A Predictive Model of Stop-out Honors Students** The purpose of this study was to examine factors that affect the probability of honors students at risk to leave a major U.S. university. Logistic regression modeling and validation were used in this study. The result showed that honors students' probability of leaving this institution was significantly associated with GPA, school, high school class size, residence, and housing. Workshare
2:00 - 2:50 pm *Freedom Room* **Jeff Seybert** Director, Institutional Research Johnson County Community College	**Benchmarking in Community Colleges: Progress of Two National Initiatives** Numerous benchmarking consortia exist for four-year colleges and universities. Such consortia are nonexistent, however, for two-year colleges. Johnson County (KS) Community College is involved in implementation of two such projects: the Kansas Study (of community college instructional costs and productivity); and the broader National Community College Benchmarking Project. This paper reports on the progress of those two initiatives. Contributed Paper
2:00 - 2:50 pm *Salon I* **Dawn Geronimo Terkla** Executive Director, Institutional Research Tufts University **Heather Roscoe** Senior Research Analyst Tufts University **Jane Etish-Andrews** Director International Office Tufts University	**The International Undergraduate Student Experience** The primary purpose of this paper is to describe the results of a yearlong effort that was devoted to obtaining information in order to better understand the experiences of international undergraduates, who attend Tufts University. This research was commissioned by the International Board of Overseers. Information was gathered using both a web-based survey and in-depth interviews. Contributed Paper
2:00 - 2:50 pm *Stars & Stripes Room* **Philip L. Beardsley** Independent Consultant	**The Academic Consequences of State Need-Based Grants** State need-based grant programs can have not only beneficial consequences for access and affordability, but also in the academic realm as well. The latter benefits are manifested in credits enrolled, credits accumulated, GPA, and retention/graduation. These conclusions apply to all types of institutions. Contributed Paper

Monday, November 17, 2003 (continued)	
2:50 - 3:00 pm *South East Foyer*	**Break**
2:00 - 2:50 pm *Weatherly Room* **Thomas B. Higerd** Associate Provost, Institutional Research & Assessment Medical University of South Carolina **Catherine E. Watt** Interim Director, Institutional Research Clemson University **Ronnie Chrestman** Senior Statistician Clemson University	**Using Facilities Information to Improve Academic Decision-Making** A physical plant inventory no longer meets planning and accountability needs. The Medical University of South Carolina designed and is now sharing an open source web-based Space System whose elements can be linked to fiscal, personnel and research databases. A Consortium to facilitate inter-institutional comparisons will also be introduced. Workshare
3:00 - 3:50 pm *Columbia Room* **Michael J. Dooris** Director, Planning Research & Assessment The Pennsylvania State University	**Tenure-Track Progression of Assistant Professors** This paper explores the rates at which newly appointed faculty members receive tenure. Data for six cohorts - those entering the tenure-track at Penn State from 1990 to 1995 - are analyzed in the context of related institutional information, and in comparison to national and peer-institution studies. Contributed Paper
3:00 - 3:50 pm *Courageous Room* **Michelle Steinowicz** Consultant, Academic Accounts Runzheimer International	**A Unique Approach to Recruiting and Retention of Faculty and Staff** This presentation will focus on the use of purchasing power and cost of living data and it's impact on various compensation, recruitment, and financial aid issues currently facing institutions. It will demonstrate how these data have been used by colleges and universities to adjust faculty and staff salaries to equalize purchasing power amongst peer institution locations as well as other applications. Runzheimer is the data source to US News & World Report America's Best Colleges edition regarding Faculty Compensation. Vendor Showcase
3:00 - 3:50 pm *Enterprise Room* **Lillian Zhu** Director, Institutional Research & Planning SUNY College at Brockport	**Who Attains a Bachelor's Degree in Four Years? Exploring the Time to Graduate in Public Four-Year College** This study intends to identify the factors that are related with time-to-degree within four, five, and six years, in a public four-year college. The study focuses on students' characteristics, pre-college preparation, academic performance, financial aid, family income, hours working, parents' education level, and intention of achieving a bachelor degree. Contributed Paper

Monday, November 17, 2003 (continued)	
3:00 - 3:50 pm *Freedom Room* **Raymond Hicks** Senior Research Analyst Adelphi University **Nava Lerer** Director, Office of Research, Assessment and Planning Adelphi University	**Does Student Engagement Predict Retention? Exploring NSSE Data** This paper examines the relationship between retention and Nation al Survey of Student Engagement (NSSE) responses. NSSE administrators argue that student engagement is associated with desired student outcomes. By examining whether engaged students are more likely to stay at an institution, we provide a check on the external validity of NSSE. Contributed Paper
3:00 - 3:50 pm *Salon I* **Heather S. Roscoe** Senior Research Analyst Tufts University **Dawn Geronimo Terkla** Executive Director, Institutional Research Tufts University	**The Impact of Web-Based Surveys on the Operating Procedures of Institutional Research Offices** Switching from paper to web surveys has affected operations within our office (workloads, skills required of staff and student workers, clients' costs and expectations for turnaround time). We will discuss our experiences in detail along with results from a brief survey of IR professionals at other institutions as a comparison. Contributed Paper
3:00 - 3:50 pm *Stars & Stripes Room* **Michael Duggan** Director Suffolk University	**Adobe Acrobat - A Tool for the Trade** This session will present a "tool of the trade" that may help make your job a little easier. The session will demonstrate practical, hands-on techniques for converting Excel or Word documents to Adobe Acrobat files and for making the resulting files user friendly. Workshare
3:00 - 3:50 pm *Weatherly Room* **Ebenezer Kolajo** Director of Institutional Research Cecil Community College	**Using Grades Analysis to Improve Teaching and Learning** This is a case analysis of grades as a tool for enhancing assessment, teaching, and learning. Results of this analysis show that there are differences in grades awarded from department to department and by faculty type. There is also a clear gender gap in grades. It is expected that the findings of this study would be used to provide academic assistance to students and enable faculty to engage in critically reflective teaching and grading. Contributed Paper
3:50 – 4:00 pm *South East Foyer*	**Break**

Monday, November 17, 2003 (continued)	
4:00 - 4:50 pm *Columbia Room* **Joe Jurczyk** Research Analyst Cleveland State University	**Web Accessibility Issues for Institutional Research** As the World Wide Web has become more complex, much of its content is not easily accessible by people with disabilities. This presentation will provide information on Section 508 of the Rehabilitation Act, design tips for making institutional research data "web accessible", and an overview of related development tools. Workshare
4:00 - 4:50 pm *Courageous Room* **Prety Widjaja** Senior Systems Engineer SPSS, Inc.	Predict Student Behavior to Increase Retention What if you could predict a student's path and... · Discover which inquiries are most likely to turn into applications? · Predict enrollment to specific courses? · Achieve and maintain optimum graduation rates, recruitment and retention rates? The answers to these questions and many more can be found in your institution's data. Empowered with data mining, you will discover tremendous insights in your school's challenging areas and be able to identify new opportunities. Join SPSS Inc. for a live 45-minute Clementine demonstration - this demonstration is geared for institutional researchers, enrollment management professionals, academic affairs and admissions officers who are concerned with uncovering critical information about their school's students. Vendor Showcase
4:00 - 4:50 pm *Enterprise Room* **Angela Hamlin** Research Analyst University of Maryland, College Park **Jessica Shedd** Research Analyst University of Maryland, College Park	**Do You Know Where Your Students Reside? Using Mapping Software and Geocoding for Planning and Decision Making Purpose** Mapping software can produce visual analyses and data sets with additional geographic variables useful in university/college planning and lobbying efforts. This session will introduce address geocoding concepts, demonstrate basic geocoding functions in "ArcView" and "MapPoint" mapping software, and discuss the proficiencies and limitations of these two software packages. Workshare
4:00 - 4:50 pm *Freedom Room* **Kevin B. Murphy** Research Analyst University of Massachusetts Boston	**Exploring Diversity at Public Urban Four Year Institutions by Using National Databases** This paper uses data from the Integrated Postsecondary Data System (IPEDS) and the 2000 National Postsecondary Student Aid Study (NPSAS:2000) to examine differences in the racial/ethnic diversity and language and immigration status of populations served by public urban four year institutions compared to other public four year institutions. Contributed Paper

Monday, November 17, 2003 (continued)	
4:00 - 4:50 pm *Salon I* **Suhail Farooqui** President, COO Zarca Interactive **Tom Guteberger** Vice President, College Relations Union College	**Researching Alumni: Lessons from the Field** Union College surveyed its nearly 22,000 alumni using a mixture of direct mail and online approach. We gained some interesting and practically useful insights for IR professionals on several issues including the so-called Digital Divide. We also analyzed for ballot-box stuffing of online surveys. The response rate number of respondents as a function of time from survey invitation showed some insights which other institutions can benefit from as they plan their research. Workshare
4:00 - 4:50 pm *Stars & Stripes Room* **Peggye Cohen** Assistant Vice President for Institutional Research George Washington University **Jennifer Brown** Director of Institutional Research & Policy Studies University of Massachusetts, Boston **Jim Fergerson** Director of Institutional Planning & Analysis Bates College	**HEDPC at Work: Update on Data Policy Issues Affecting IR** This session will highlight the work of the AIR Higher Education Data Policy Committee (HEDPC). Charged with following higher education data policy issues for AIR, HEDPC has a full agenda. The latest information on topics such as Reauthorization of the Higher Education Act, race/ethnicity reporting categories, graduate CDS, AIR/AAUP Advisory Committee, and copyright issues will be described and discussed. Workshare
4:00 - 4:50 pm *Weatherly Room* **Anne Marie Delaney** Director of Institutional Research Babson College	**Designing Alumni Research to Meet the Challenges and Responsibilities of Assessment and Accreditation: A Leadership Opportunity** Based on a completed alumni study of 522 private college graduates, this paper presents a model for designing alumni research for effective use in assessment and accreditation. The paper discusses how the methodology, implementation strategies, analytical techniques and strategic policy recommendations were designed to create an effective model for assessment. Bivariate analyses revealed significant differences in overall satisfaction by gender and citizenship and multiple regression identified the following significant predictors of satisfaction: the perception of enhanced achievement abilities (b=.305); superior career preparation (b=.198) ; and satisfaction with a sense of community on campus (b=.123). Contributed Paper

Monday, November 17, 2003	Evening Schedule
5:15 – 6:30 pm *Hotel Atrium*	**Data with a Twist Reception – Includes Poster Session**
5:15 - 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **John Grant** Director, Institutional Research and Development Cape Cod Community College	**Private Fund Raising by Community College Foundations - Exploring Data from Online Sources** Poster presentation of data, from online and other sources, on fund raising by community college foundations in selected Northeast states, including Massachusetts and New York. Poster
5:15 – 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **Anna May Jagoda** Director of Institutional Research & Assessment Queensborough Community College **Cheryl Goldstein** Research Coordinator Queensborough Community College	**Comparison of Two Surveys: Mail vs. In Person** Two surveys were developed by different offices. They targeted the same graduate population and the surveys included several identical questions about post graduate employment and education six months after graduation. One was mailed out with a web response option and the other was distributed when the graduate came back to the school to pick up his/her diploma. This is a unique opportunity to compare not only response rate and reliability but also to profile who responds to mail out surveys and if the response rate is adequate to generalize to the population. The poster material will contain the surveys, response patterns of same questions and profiles of responders and comparison of answers by same persons to both surveys. Poster
5:15 - 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **William E. Knight** Director of Planning and Institutional Research Bowling Green State University	**The Institutional Research Friday Factoid Puzzle Contest** The contest is an innovative method used by the IR office to increase use of IR information, highlight the role of the office on campus, and have some fun. Stop by the poster session to learn the details! Poster
5:15 – 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **Constance A. Pierson** Senior Research Analyst University of Maryland, Baltimore County	**The Road to the Ph.D. is Paved with Good Intentions: Tracking the Persistence of Ph.D. Students to Determine Factors Associated with Attrition** Concern over seemingly low rates of Ph.D. student retention and completion, as well as programmatic differences in rates, led to this detailed study of enrollment and degree history at the individual level. Student outcomes are identified and Binary Logistic Regression is used to determine the factors associated with attrition. Poster

Monday, November 17, 2003	Evening Schedule
5:15 - 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **Michael Duggan** Director, Enrollment Research & Planning Suffolk University	**AACRAO and Its Relevance to NEAIR Members** I will share with NEAIR members my experiences at the 2003 AACRAO conference which was partially funded by a NEAIR Conference Grant. Poster
5:15 - 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **Brian Bartolini** Special Assistant to the VPAA for Assessment & Director of Academic Services Providence College	**Data Collection or Change Agent?: Student Services Assessment in Rhode Island** This poster session will make available the results of a 2002 study that: (1) describes the student services assessment instruments and activities at higher educational institutions within one state, Rhode Island, and (2) advances a model assessment approach based on these findings and the relevant literature. Poster
5:15 - 6:00 pm *Hotel Atrium with the Data with a Twist Reception* **Nehama Babin** Associate Director, Office of Institutional Research & Planning University of Maryland, College Park	**NRC Rankings: Will they ever happen?** The purpose of this poster session is to describe the experience of the University of Maryland, College Park, as a participant in NRC's pilot of the *Study of Doctoral Research Programs* and it's plans for preparing for the actual study when it occurs. The session will also serve as a forum to exchange any information individuals or institutions might have about the rankings, the methodology, the instruments, the taxonomy, or NRC's time-line and calendar. The poster session will address the issue of providing feedback to the NRC and determining if any influence might be brought to bear by higher education associations and organizations on the NRC regarding its approach to the rankings. Poster
5:15 - 6:00 pm *Hotel Atrium with the Data with a Twist Reception* Cherry Danielson Research Fellow, Center of Inquiry in the Liberal Arts Wabash College	International Higher Education Issues via the NEAIR Travel Grant Program As a recipient of the NEAIR Travel Grant, I share my experience at The European Association of Institutional Research 2003 Forum held at the University of Limerick, Ireland. Most prominent in this discussion is the current European pact of 29 nations aiming to reform higher education structures across national boundaries. Poster
6:30 pm *Meet in Hotel Lobby* **Gayle Fink** Director The Community College of Baltimore County	**MdAIR SIG (Maryland Association for Institutional Research)** Come join Maryland Association for Institutional Research members for an evening of good food and conversation. There is always a story to tell after a MdAIR SIG. Special Interest Group

Monday, November 17, 2003	Evening Schedule
6:30 pm - ? *Sign up and menus at Conference Registration Desk and Reception* *Meet in Hotel Lobby*	**Monday Evening Dinner Groups** Following Data with a Twist Reception, join a group of fellow NEAIR members for dinner at one of several Newport restaurants. This is the perfect opportunity to meet new people, connect with old friends, and sample the bounty of Newport. Sign-up sheets and menus will be at the Registration Desk all day.
Tuesday, November 18, 2003	
8:00 – 11:00 am *East Foyer – Registration Desk*	**Conference Registration**
7:30 – 8:45 am *Salons III & IV*	**Hot Breakfast Buffet**
8:00 – 8:45 am *Salons III & IV*	**Table Topics and Special Interest Groups**
8:00 - 8:45 am *Courageous Room* **Sandra Atkins** Assistant Director HEDS Consortium **Erika Newcomer** Research Associate HEDS Consortium	**Higher Education Data Sharing (HEDS) Consortium** This session will provide an opportunity for members of HEDS to discuss on-going and proposed HEDS activities with other HEDS colleagues. All members of HEDS are welcome. Special Interest Group
8:00 - 8:45 am *Salons III & IV* **Dianne Cleary** Associate Research Analyst University of Massachusetts Boston	**Effective Reporting: Developing a New Reporting Format** A discussion of the process of developing new reporting formats, strategies and pitfalls. Table Topic
8:00 - 8:45 am *Salons III & IV* **Felice D. Billups** Director, Planning & Research RI School of Design	**The Role of Institutional Research in Institutional Self Study** Institutional Research offices play a key role in a successful self study process. Conference participants are invited to join this discussion to share ideas about ways IR offices can support institutional self study and to hear one campus's experiences with using IR data and services to enhance the accreditation process. Table Topic

Tuesday, November 18, 2003 (continued)	
8:00 - 8:45 am *Salons III & IV* Cherry Danielson Research Fellow, Center of Inquiry in the Liberal Arts Wabash College	IR & Liberal Arts Education **Over time, liberal arts education has been given credit for endless unconfirmed outcomes, and unfortunately, in the process it has lost its meaning. This table topic session engages in a discussion of how institutional researchers might assist with defining and identifying the value and outcomes of a liberal arts education.** Table Topic
8:00 - 8:45 am *Salons III & IV* **Gayle Fink** NCRP President and Director The Community College of Baltimore County	**National Council for Research and Planning (NCRP)** Join community college colleagues and learn about NCRP, the only national organization that exists exclusively to serve institutional research and planning professionals in 2-year, postsecondary educational institutions. Learn about recent organizational changes and member services. Issues related to community college IR professionals will also be discussed. Special Interest Group
8:00 - 8:45 am *Salons III & IV* **Heather Jasmin** Information Technologist II Keene State College	**Datatel Users** Join fellow Datatel clients in an informal conversation about the practice of institutional research in the Colleague environment. Use this opportunity to raise questions, find support, and share suggestions and strategies with your NEAIR colleagues. Special Interest Group
8:00 - 8:45 am *Salons III & IV* **Catherine J. Alvord** Research/Planning Associate Cornell University	**SUNY-AIRPO** Members of AIRPO and other interested NEAIR members are invited to attend. Committee Chairs and state group leaders will have an opportunity to report. This provides an opportunity to discuss areas of common concern and interest in matters related to Institutional Research in New York State institutions of higher education. Special Interest Group
8:00 - 8:45 am *Salons III & IV* **Heather Kelly Isaacs** Institutional Research Analyst University of Delaware Julie Alig Director, Institutional Research Saint Anselm College	**Focus Group for 2004 NEAIR Conference Planning** By Invitation Only Table Topic

Tuesday, November 18, 2003 (continued)	
8:00 - 8:45 am *Salons III & IV* **James F. Trainer** Director of Planning and Assessment Villanova University **Don Gillespie** Director of Institutional Research Fordham University	**Catholic Higher Education Research Cooperative (CHERC)** After meeting informally for each of the past nine years institutional researchers from catholic colleges and universities from across the country have come together to create the Catholic Higher Education Research Cooperative (CHERC). This SIG will provide an opportunity for interested parties to meet their colleagues and to discuss the organizational plans and research agenda for CHERC's first year of formal operation and beyond. Special Interest Group
8:00 - 8:45 am *Salons III & IV* **Alan J. Sturtz** Director, Institutional Research & Planning Connecticut State University System Office	**Policy Driven by Data** An issue was raised by a university to charge a separate fee to students who are enrolled in basic skills proficiency (remedial) courses. The premise for this was that the cost of offering these courses was a major drain on scarce fiscal resources. A counterproposal was made that not only were remedial courses beneficial, they were actually a revenue-producing product with beneficial results for the student and the university. This Table Topic session will discuss the issue of data, or the lack thereof, should be a key component of policy decisions made by a university's board of trustees and the different data analyses that were used to make the case. Table Topic
8:00 - 8:45 am *Salons III & IV* **Peggye Cohen** Assistant Vice President for Institutional Research George Washington University **Phyllis Fitzpatrick** Director of Management Information Fairfield University	**Banner SIG** This session will provide an opportunity to continue conversation with your NEAIR/Banner colleagues. It's an open forum conducive to the exchange of ideas, seeking help, and providing assistance. Special Interest Group
Break Out Sessions	
9:00 - 9:50 am *Columbia Room* **H. Leon Hill** Director of Institutional Research and Assessment Montgomery County Community College **Marian Weston** Research Analyst Montgomery County Community College	**Does It Really Make a Difference? Designing Measures to Assess Outcomes for New Technologies Introduced in the Classroom** The purpose of the presentation is to discuss ideas/concepts on how to measure the effectiveness of implementing new technology in the classroom. This would include understanding the effect the technology has on various student outcomes within the course. In addition, measures would also be needed to assess the faculty member's work productivity and satisfaction with utilizing the technology in the classroom. Workshare

Tuesday, November 18, 2003 (continued)	
9:00 - 9:50 am *Courageous Room* **Kevin W. Sayers** Director of Institutional Research & Effectiveness Capital University	**Connecting Written Comments and Survey Research Analyses: A Software Demonstration of Nvivo 2.0** Institutional researchers often struggle with what to do with written comments from survey research. How do they relate to quantitative indicators? How can quantitative and qualitative analyses be linked? Is there software that manages sets of quantitative and qualitative data collectively? A demonstration of Nvivo seeks to answer these questions. Workshare
9:00 - 9:50 am *Enterprise Room* **Diane J. Goldsmith** Dean, Planning, Research, and Assessment Connecticut Distance Learning Consortium **Carolyn Rogers-Ward** Online Student Services Coordinator Connecticut Distance Learning Consortium	**The Use of Asynchronous Threaded Discussion Forums in Institutional Research** This workshare will demonstrate the use of asynchronous discussion forum software in qualitative research, discuss the advantages and disadvantages of using such forums, the preparation needed to help participants be successful in using this technology, and what we have learned from our successes and mistakes in two different research projects. Workshare
9:00 - 9:50 am *Freedom Room* **Stephen R. Porter** Director, Office of Institutional Research Wesleyan University **Michael E. Whitcomb** Assistant Director, Office of Institutional Research Wesleyan University	**2002 NEAIR Best Paper Award** **The Impact of Contact Type on Web Survey Response Rates** In a survey of over 12,000 high school students, two experiments tested whether the techniques employed to increase survey response in traditional paper surveys translate to the electronic medium. The impact of the use of personalization, authority, and scarcity in email contacts on survey participation rates will be discussed. Contributed Paper
9:00 - 9:50 am *Middletown Suite* **Janet Nickels** Director of Institutional Research Carroll Community College **Jean Marriott** Research and Planning Analyst Carroll Community College	**Student Outcomes in Distance Learning: A Case Study** This presentation will examine the growth of online courses in a community college setting. In tandem, distance learning outcomes, such as student achievement, satisfaction, and retention will be studied. Implications of findings will lead the community college in charting out next steps to grow and improve distance learning. Workshare

Tuesday, November 18, 2003 (continued)	
9:00 - 9:50 am *Stars & Stripes Room* **Robert K. Myers** Associate Vice President for Institutional Assessment Berklee College of Music	**Research, Assessment, and Faculty Involvement: Showing Improvement and Growth** Institutional research and faculty involvement in assessment are perceived by many as meaningless make-work exercises. This is absolutely true, unless the results are used to improve teaching, learning, and institutional effectiveness. Faculty and IR administrators have been so put upon by assessment jargon and procedures that no one wants to waste time with top-down, generalized assessment, which is too often conducted for its own sake or to show off to accreditors. From the viewpoint of a formerly frustrated assessment officer, you will hear how we developed an approach to assessment that involved faculty doing what they do best, how this approach gained the approval of the NEASC, and how you can apply the principles to broader-based liberal arts colleges and universities. Contributed Paper
9:00 - 9:50 am *Weatherly Room* **Brian Johnston** Research Analyst The Catholic University of America	**Ensuring the Accuracy of Student Data in the PeopleSoft Student Administration System** How the Catholic University of America's Office of Institutional Research leverages the organization tables used to set up the PeopleSoft Student Administration System to insure the integrity of individual student data. The session will review typical methods used to pull various types of student enrollment information from the system, and will show how to use organization tables to build a series of internal and external checks of student data prior to its use in university reporting. Internal checks, used to maintain the integrity of live data in the system, and external checks, used to verify the accuracy of census data for institutional reporting, will both receive an equal amount of attention during the session since both are vital to the role of the Institutional Researcher. This session will also highlight how accurate organization tables are and how they can be as a useful planning tool for the university community. Workshare
10:00 - 10:50 am *Columbia Room* **Ellen Boylan-Fick** Assistant Director Institutional Research Marywood University **Charlotte Woodward** Data Analyst Marywood University	**Using the Web to Boost IR Efficiency and Reach** There are several easy and practical innovations you can make to enhance and improve IR operations inside-out, changes that can also quickly elevate your profile and reputation as a valuable resource for those you serve on and off campus. This session will present a number of excellent tips and tactics for boosting IR efficiency and reach, such as: building a system in intranet information exchange that has varying levels of access and security; creating an internal web site for accreditation documents; and incorporating use of the best data management tools and programs to help you look sharp and be accessible. Contributed Paper

Tuesday, November 18, 2003 (continued)	
10:00 - 10:50 am *Courageous Room* **Raymond Barclay** Senior Analyst The College of New Jersey **Paula A.Y. Maas** Assistant Dean, School of Science The College of New Jersey	**Understanding Gateway Course Effects in Biology: An Application of Multilevel Modeling to Curriculum Assessment** An institutional research office can play a critical role in curriculum innovation when able to provide technical assistance to curriculum planners who need to develop complex instructional assessment models that account for the multiple levels of data in estimating group effects. To this end, we are undertaking a retrospective cohort study aimed at understanding gateway course impacts within a biology program curriculum via a two-tiered multilevel modeling procedure (course-level and instructor-level). Contributed Paper
10:00 - 10:50 am *Enterprise Room* **Kathryn Doherty** Coordinator, Learning Outcomes Assessment Howard Community College	**Redesigning an Assessment Program: Connecting the Dots for Middle States Review** This workshare looks at one institution's approach to addressing the new Middle States requirements in outcomes assessment. On a campus with an existing, and successful, assessment program, the challenge becomes connecting the dots in a way that demonstrates to Middle States the effectiveness, continuity and ties to strategic planning that underlie and support the outcomes assessment process. Presentation will focus on practical, hands-on application, integration with existing programs, and demonstration of successful redesign. Workshare
10:00 - 10:50 am *Freedom Room* **Kathleen Keenan** Director, Institutional Research Massachusetts College of Art	**IR's Excellent Adventure in Institutional Change** This is a flippant title for a serious workshare—but it does accurately describe a project that was both an adventure and excellent. The session will discuss Institutional Research participation in a five-year process that led to definition of a new, more autonomous status for Massachusetts College of Art within the state's public higher education system. The new status, granted to Mass Art in legislation enacted with the FY 2004 state budget, is based on a new financial model and enrollment management plan, and is being implemented beginning in the fall of 2004. The session will focus on roles for IR in a change process: what skills and resources can IR contribute to planning for change, and how we can prepare ourselves as professionals to be effective participants in that process. Workshare
10:00 - 10:50 am *Middletown Suite* **David Hemenway** Research Associate Connecticut State University System Office	**Traditional Graduate Surveys - There Must Be a Better Way!** The author has analyzed a standard graduate survey that has been used for a number of years. He suggests ways of improving the traditional survey instrument and proposes several other sources of basic assessment information. These include research in capstone courses, data from the Universities integrated student information system, information from state agencies and information from the National Student Clearinghouse. Contributed Paper

Tuesday, November 18, 2003 (continued)

10:00 - 10:50 am *Stars & Stripes Room* **Robert C. Froh** Associate Director New England Association of Schools & Colleges **Christine Brooks Cote** Director of Institutional Research and Registrar Bowdoin College **Erin Lowery-Corkran** Graduate Research Assistant New England Association of Schools & Colleges **C. Ellen Peters** Associate Director for Institutional Research Bates College	**Working with Faculty to Consider the Impact of Teaching on Student Learning** The Bates-Bowdin initiative encourages collaboration between selective liberal arts colleges in New England to create a "culture of inquiry." Presenters will describe approaches used to evoke faculty and student questions about teaching that provide direction to inquiry which can be generalized across time and contexts, and modes of inquiry that enable collaboration and comparative analysis across a number of institutions to stimulate advances in curriculum and pedagogy. Workshare
10:00 - 10:50 am *Weatherly Room* **Tae Young Han** Director, Outcomes Assessment Research Excelsior College Nathan Schneeberger Research Associate Excelsior College	**Students' Workplace Competency Assessments: Utilization of Dual Sources of Information** This study examined graduates' self-report and supervisors' assessment of work-related college learning outcomes. The relationships between the two ratings were investigated in terms of the graduates' academic experience and individual characteristics. This integrative approach provided richer implications for the institutional quality given the measurement limitations of each method alone. Contributed Paper
11:00 am *Salons III & IV*	Drawing for Gifts and Refreshments Conference attendees will have the opportunity to win commemorative gifts from the region, as well as from our conference vendors. You ***must be present to win*** for these drawings. Those attendees who have completed their "Vendor Passport" will be eligible to win free registration for a 2004 NEAIR Pre-conference Workshop. All completed passports may be left at the conference registration desk and you ***need not be present to win*** for this particular drawing. Special Session