NEAIR

32ND ANNUAL CONFERENCE

NOVEMBER 6 – 8, 2005, THE SARATOGA, SARATOGA SPRINGS, NY

The Race For Answers:

Clarity Versus Information Overload

32nd Conference Proceedings

Dear NEAIR Friends and Colleagues,

The Association's 32nd Annual Conference was held in beautiful Saratoga Springs, New York, a town known for its "health, history, and horses." The town welcomed over 300 of our members and guests from November 5 through 8, 2005, providing ample opportunities for shopping in the downtown area surrounding the host hotel, The Saratoga, as well as relaxation and rejuvenation in the city's historic baths and spas. The conference set a new record for registrations with 299 paid registrations.

The theme for this year's conference was *"The Race for Answers: Clarity versus Information Overload."* Attendees had a record number of Pre-Conference workshops from which to choose (17) as well as a Colloquium for Experienced practitioners. Skidmore College hosted a variety of computer-based workshops. Early arrivals were treated to a taste of the Saratoga racing culture during the Saturday night reception *"A Night at the Races"* – members enjoyed cheering on their favorite horses during the video racing as well as sporting festive racing-themed attire. The official beginning of the conference was marked by the Sunday evening keynote, delivered by Dr. John Lombardi, Chancellor of the University of Massachusetts Amherst who engaged attendees with his lively talk on *"Public Relations, Accountability and Measurement: What Do You Want? How Do You Get It?"* Dr. Joseph Moore, President of Empire State College, delivered a thought provoking and data-rich plenary session on Monday morning, *"Good Data, Wrong Questions: The Role of IR in Higher Education Policy."* Attendees selected from 50 concurrent sessions (including 5 invited speakers and 5 Vendor Showcases), approximately 20 poster sessions (including a poster on the results of the Association's Member Survey), and numerous Special Interest Groups (SIGs) and Table Topics. Four Past Presidents – Jennifer Brown, Mary Ann Coughlin, Jim Trainer, and Fred Volkwein – closed the conference with a plenary panel reflecting on themes from the conference and trends in IR.

The conference saw the implementation of new initiatives. First, NEAIR moved to a totally online registration process thanks to the considerable efforts of Roland Hall, Beth Simpson, and the AIR staff. The web registration enabled the association to accept credit card payments for the first time – a service that members had been requesting for several years. Finally, the association implemented its Best Practitioner Paper/IR Report, thought to be the first such award among AIR and its affiliates; presenters of contributed papers as well as workshares and posters were eligible to submit in this category.

Throughout the conference, attendees who were involved in the association as committee members and mentors, as well as those in leadership positions, were recognized. Their efforts were reported on during the Annual Business Meeting at the Monday luncheon. Additionally, the membership passed a series of amendments to the governance structure in the Association's Constitution; the amendments grew out of an ad hoc committee whose recommendations were approved by the Steering Committee and proposed to the membership for a formal vote.

I would be remiss if I did not mention the outstanding commitment and contributions of your Saratoga Race Stewards, the 2005 Conference Team. Organizing a conference of this size required countless hours, attention to details they never knew existed, and a healthy sense of humor when things didn't go as expected. This team contributed all of these to the effort and I

will be forever grateful for their dedication, hard work, support and friendship. Kelli Parmley (SUNY New Paltz) served as Local Arrangements Chair and was assisted by Allison Walters (University of Delaware) and Joe Stankovich (Skidmore College). Mitch Nesler (Empire State College) served as Program Chair with the able assistance of Associate Program Chair Bruce Szelest (University at Albany) and Pre-Conference Workshop Coordinator Nancy Ludwig (Northeastern University). Jessica Shedd (NACUBO) served as chair of the Web Committee with assistance from Roland Hall (Georgetown University). Tim Walsh (Temple University) was Vendor Chair; Mindy Wang (Catholic University) was Evaluation Chair; Wendell Lorang (University at Albany) chaired the Best Paper Committee; and Gayle Fink (University System of Maryland) served as Publications Chair, coordinating the production of these Proceedings as well as our first-ever electronic repository for conference presentations and handouts. Additionally, many thanks go to the members of the Best Paper and Publications committees for their considerable efforts to "clean up" after the conference. Kelli Armstrong and Alan Sturtz coordinated the Mentoring/Newcomers Committee which assisted many first-time attendees as they navigated the conference. Many members assisted us by staffing the registration desk, leading dinner groups, and performing the numerous tasks that arise during a conference – many thanks for your willingness to help. Beth Simpson, the Association's Administrative Coordinator was invaluable for keeping us all on task and overseeing the registration process and compilation of registration materials, as well as for serving as a trusted colleague and sounding board.

Finally, I would like to take this opportunity to thank the members of the Steering Committee and the many NEAIR members who supported the association as well as me personally; I was overwhelmed by the notes of encouragement, offers of help, and quick responses to calls for assistance over the course of my year as President. NEAIR is full of truly talented, motivated, and supportive colleagues and for that I cannot express enough gratitude.

Now I invite you to sample the contributions of our members during our *"Race for Answers."* I am certain you will find fresh ideas and support for the work you do in your institution. It is also my hope that the materials which follow will encourage you to participate in future conferences and that you find in them models for the best in reporting and publications.

With warm wishes for your continued success,

Michelle Appel
NEAIR President 2004-2005

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* Winner 2005 Best Paper
** Winner 2005 Best First Paper
*** Winner 2005 Best IR Report/Practioner Paper

Acknowledgement

I am proud to present the NEAIR 32ND Annual Conference Proceedings that records research work compiled by our members and presented at the 2005 annual conference.

This year, 12 NEAIR Colleagues submitted nine conference papers to be included in the Proceedings. In addition to these research papers, 2005 marks the first time that NEAIR has included the Best Practioner/IR Report in the Proceedings. Additional practioner papers and presentations are available in the "Members Only" portion of the NEAIR website. Two colleagues joined me to form an editorial committee – Catherine Alvord, Cornell University and Jean Marriott, Carroll Community College. The committee members reviewed the submitted papers and provided friendly comments and suggestions to the authors regarding language and clarity if necessary.

I would like to express my gratitude to my two colleagues who graciously volunteered their time to the review thus ensuring a professional Proceedings publication.

Gayle Fink, Editor
University System of Maryland

THE PENNSYLVANIA STATE SYSTEM OF HIGHER EDUCATION'S PERFORMANCE FUNDING PROGRAM 2005-2006[1]

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Abstract

The annual performance funding program links an evaluation of each university's performance to a percentage allocation of the Educational and General Appropriation funds distributed to the Pennsylvania State System of Higher Education. Performance is evaluated using institutional historical baselines, external benchmarks, and System Performance Targets. By providing financial incentives for improving performance within eight funding areas, the System is moving the 14 member universities in strategically desirable directions.

Introduction

Higher education has seen significant increases in performance-based funding since its introduction by the state of Tennessee in 1978. Burke and Minassians' (2003) survey details the growth in performance funding—from 10 states in 1997 to 15 states in 2003 (with a high of 19 states in 2001). States have implemented performance funding include increasing pressures to measure institutional performance with limited fiscal dollars (Woodley, 2005), requirements that universities be responsive to stakeholders (Borden and Banta, 1994; Armstrong, et. al., 2004), and demands for higher education institutions to improve quality, productivity, and effectiveness (Peterson and Augustine, 2000).

Performance funding recognizes that additional financial resources positively impact institutional behavior. By targeting certain quantitative measures of institutional performance, additional financial resources not only reward institutions for high levels of performance, but also provide incentives for institutions to prioritize their efforts to achieve improved performance.

Allocation of funds based upon performance tends to fall into two general performance-based funding categories: performance funding and performance budgeting (Burke and Minassians, 2003). Performance funding provides state funds directly to universities based on

[1]The authors would like to recognize Christina Hendriksen, Jeff Kinsey, Sara Senko, and Melinda Tobin, Pennsylvania State System of Higher Education, for their contributions to the Performance Funding Program. Any errors are the responsibility of the authors.

performance on individual indicators. Performance budgeting provides the possibility of additional funding due to the discretion of state, coordinating and system officials who use university performance on individual indicators as one factor in determining performance allocations.

The Pennsylvania System of Higher Education's (PASSHE) current Performance Funding Program was developed with university presidents and approved by the Board of Governors in October 2002. The program was not initiated in response to legislation. Adoption of the Performance Funding Program without a mandate is common, as 53% of such programs are not required by legislation (Burke and Minassians, 2003).

PASSHE's Performance Funding Program awarded 7% of its base appropriation from the Commonwealth for FY 2005-2006. PASSHE's current percentage funding level is in the high range of states with performance funding programs—the range is from 0.5% to about 6% with the average being 2% (Burke, 2005).

The next section of this paper provides details about PASSHE's Performance Funding Program. While Burke and Minassians' (2003) survey indicated that performance funding has had a minimal to moderate impact on improved performance of public colleges and/or universities for 67% of states having a performance funding program, some early trends reported by PASSHE suggest their Performance Funding Program has had an important impact.

Pennsylvania State System of Higher Education's Performance Funding Program

In 2000, the PASSHE Board of Governors began allocating a portion of the Commonwealth's appropriation to the universities based on their performance. Based upon the report, *System Funding Formula and Performance Funding Concept Paper for the Pennsylvania State System of Higher Education* (July 12, 2001), the current Performance Funding Program was approved by the Board of Governors in October 2002. The Program utilizes eight of the 17 measures of the System Accountability Plan - a performance reporting program used for accountability purposes (Armstrong, et. al., 2004; Office of the Chancellor, August 2005).

PASSHE's Performance Funding Program awarded $2 million in funding to 14 universities in its first year, FY 2000-2001, and has grown to 7% or $31,174,700, of PASSHE's Educational and General Fund appropriation from the Commonwealth for FY 2005-2006. The 14 PASSHE Universities are Bloomsburg, California, Cheyney, Clarion, East Stroudsburg, Edinboro, Indiana, Kutztown, Lock Haven, Mansfield, Millersville, Shippensburg, Slippery Rock, and West Chester University.

In 2004, the Board of Governor's adopted PASSHE's Strategic Plan, *Leading the Way*, resulting in the alignment of the eight performance funding measures within the Strategic Plan Goal Categories. Performance funding provides financial incentives for Goal improvement as envisioned in the Strategic Plan. Listed below are the four Goal Categories (the fifth Category, Public Leadership, does not include a performance funding measure) aligned with the performance funding measures:

(1) Student Achievement and Success: Second Year Persistence; Graduation - Four and Six Year;
(2) University and System Excellence: Degrees Awarded - Bachelor's; Employee Diversity; Faculty with Terminal Degrees;
(3) Commonwealth Service: Degrees Awarded - Masters; Masters Cost per Full Time Equivalent (FTE) Student; and
(4) Resource Development and Stewardship: Faculty Productivity; Personnel Ratio; Undergraduate Cost per Full Time Equivalent (FTE) Student.

The distribution of performance funding monies parallels the methodology used to determine universities' quantitative performance within the three components of the System Accountability Plan: Institutional Improvement, Comparative Achievement, and Performance Target Attainment.

Institutional Improvement evaluates performance relative to a historical baseline. University performance on measures is determined by comparing actual performance to a historical baseline developed using the University's and System's historical data. Evaluation categories are described in **Table 1**.

Table 1: Baseline Evaluation Categories

Baseline Evaluation	How well a university did in attaining their target relative to the projected performance baseline for the current year
Exceeded	Baseline is exceeded if performance is at or above the upper bound for measures that are expected to increase (at or below the lower bound for measures that are expected to decrease*)
Met	Baseline is met if performance is within the upper bound and equal to or greater than the lower bound around the target (above the lower bound and at or below the upper bound for measures expected to decrease*)
Not Met	Baseline is not met if performance is below the lower bound for measures that are expected to increase (above the upper bound for measures that are expected to decrease*)

Note: A within sample of one standard deviation is generally used for bounds but for some measures, a standard deviation of values is generated by prediction methods used.
*The inverted measures are personnel ratio and instructional costs per FTE student.

The second evaluative component, Comparative Achievement, uses external standards/benchmarks to evaluate a university's performance. Benchmarks include external standard comparison groups of state-wide benchmarks, national benchmarks, University selected peer institutions, and System-wide averages where external data are not available. The methodology for determining performance is shown in **Table 2**.

Table 2: Benchmark Performance Evaluation Categories

Benchmark Evaluation	How well a university performed compared to an external standard comparison group data
Exceeded	Benchmark is exceeded if performance is one standard deviation or more above the average level for the external standard (one standard deviation or more below the average level for the external standard of measures that are expected to decrease*)
Met	Benchmark is met if performance is above or equal to the average level for the external standard but below the average plus one standard deviation (below or equal to the average level for the external standard but above the average minus on standard deviation for measures that are expected to decrease*)
Not Met	Benchmark is not met if performance is below the average level for the external standard (above the average level for the external standard*)

Note: National benchmark data for graduation and retention rates at public institutions are obtained from the Consortium for Student Retention Data Exchange. For national benchmarking, universities are clustered by both selectivity (as measured by average Scholastic Assessment Test scores for entering freshmen) and Carnegie classification. For other measures, 15 peers in the same Carnegie classification were selected for each university. For some measures, benchmark data is unavailable—in those cases a System average is used as the benchmark.
*The inverted measures are personnel ratio and instructional costs per FTE student.

Starting with the 2004-2005 reporting year, university performance was evaluated annually relative to a university's progress in attaining PASSHE's System Performance Targets (SPT) as the third performance evaluation category, Performance Target Attainment. The SPTs are System average goals that are unchanged until 2009 and set for all measures and sub-measures (Armstrong, et. al., 2004). Unlike the previous two evaluation categories, the SPTs are the same for all universities. The methodology is consistent with benchmarking and institutional baseline (see **Table 3**).

Table 3: System Performance Target Evaluation Categories

System Performance Target Evaluation	How well a university did as compared to the System Performance Target for the current year
Exceeded	System Performance Target is exceeded if performance is at or above the upper bound for measures that are expected to increase (at or below the lower bound for measures that are expected to decrease*)
Met	System Performance Target is met if performance is below the upper bound and equal to or greater than the lower bound around the target (above the lower bound and at or below the upper bound for measures expected to decrease*)
Not Met	System Performance Target is not met if performance is below the lower bound for measures that are expected to increase (above the upper bound for measures that are expected to decrease*)

*The inverted measures are personnel ratio and instructional costs per FTE student.

Performance funding provides resources to universities based on how well they compared to their own baselines, benchmarks, and the SPTs, and how many other PASSHE universities were in the same or a higher performance bracket for each measure and sub-measure.

Universities who "met" or "exceeded" baselines, benchmarks, or SPTs for any of the eight performance funding measures receive additional funding.

Six of the eight performance funding measures have sub-measures for a total of 23 sub-measures evaluated for baselines (see **Table 4)**. Because benchmarks and SPTs evaluations are limited to percentage and ratio comparisons, 14 sub-measures are used for these performance evaluation categories.

Table 4: Performance Funding Measures and Sub-Measures for Evaluation

Number	Measure	Sub-Measures	Baselines	Benchmarks	System Performance Targets
1	Degrees Awarded	Number - Bachelor's	X		
		Degree to Enrollment Ratio - Bachelor's	X	X	X
		Number - Masters	X		
		Degree to Enrollment Ratio - Masters	X	X	X
2	Second Year Persistence	Students Persisting - Overall	X		
		Retention Rate - Overall	X	X	X
		Students Persisting - Black and Hispanic combined	X		
		Retention Rate - Black and Hispanic combined	X	X	X
3	Graduation Rates	Number of Students who Graduated in Four Years - Overall	X		
		Percent of Students who Graduated in Four Years - Overall	X	X	X
		Number of Students who Graduated in Four Years - Black and Hispanic combined	X		
		Percent of Students who Graduated in Four Years - Black and Hispanic combined	X	X	X
		Number of Students who Graduated in Six Years - Overall	X		
		Percent of Students who Graduated in Six Years - Overall	X	X	X
		Number of Students who Graduated in Six Years - Black and Hispanic combined	X		
		Percent of Students who Graduated in Six Years - Black and Hispanic combined	X	X	X
4	Faculty Productivity	Total Credits per FTE Instructional Faculty	X	X	X
5	Employee Diversity	Number of Minority Faculty	X		
		Percent of Faculty who are Minority	X	X	X
6	Personnel Ratio	Total Personnel Compensation as a Percent of Total Expenditures and Transfers	X	X	X
7	Instructional Cost	Masters Cost per FTE Student	X	X	X
		Undergraduate Cost per FTE Student	X	X	X
8	Faculty Terminal Degrees	Percent of Full-time Tenured or Tenure Track Instructional Faculty	X	X	X

Note**:** White and Hispanic students are used instead of Black and Hispanic for Cheyney University.

Table 5 briefly lists the description of the data for all performance funding measures and sub-measures (see Office of the Chancellor, August 2005, for greater detail). Data definitions and criteria are regularly reviewed for comparability. As a means of ensuring accountability and equity, the university self-reported statistics are audited by PASSHE's Internal Review Group on a cyclical basis to ensure the accuracy of reported results.

Table 5: Performance Funding Measures and Sub-Measures: Descriptions

Measure	Calculation of Measure	Date(s) of Baseline Measure	Date(s) of External Benchmark/System Average and Peer Group	System Performance Targets
Degrees Awarded	# of degrees/# fall FTE for same level & year (bachelor's/master's).	Bachelor's: 2004-2005 degrees awarded and the average of fall 1999-2001 undergraduate enrollments; Masters:2004-2005 degrees awarded and the average of fall 2003 and 2004 graduate enrollments	Bachelor's: 2003-2004 degrees awarded and the average of fall 1998-2000 undergraduate enrollments; Institutional Peer (IPEDS) public	Degree to Enrollment Ratio - Bachelor's (21.50%) and Master's (67.00%)
Second Year Persistence Rate	# of cohort students returning second year (overall and by combined black and hispanic ethnicity)/ # of total cohort students; includes full-time first-time degree-seeking freshmen.	Fall 2003 cohort	Fall 2003 cohort; National Cluster (CSRDE) public	Retention Rate - Overall (79.00%) and Black and Hispanic Combined (79.00%)
Four and Six Year Graduation Rates	# of cohort students graduated/ # of total cohort students (within 4 and 6 years). Overall and by combined black and hispanic ethnicity; includes full-time first-time degree-seeking freshmen	Fall 2000 cohort for 4 years; Fall 1998 cohort for 6 years	Fall 1998 cohort for 6 years, Fall 2000 cohort for 4 years; National Cluster (CSRDE) public	Percent of Students who Graduated in Four Years and Six Years- Overall (30.00% and 55.00%) and Black and Hispanic Combined (30.00% and 55.00%)
Faculty Productivity	# of annualized student credit hours/# of instructional FTE faculty	July 1, 2003 to June 30, 2004	July 1, 2003 to June 30, 2004; System Average	Total Credits per FTE Instructional Faculty (565.00)
Employee Diversity	# of FT minority faculty/# of FT faculty	Fall 2003	Fall Staff 2003; Institutional Peer (IPEDS) public	Percent of Faculty who are Minority (15.00%)
Personnel Ratio	Total E&G personnel costs/Total Expenditures and Transfers	2003-04	2003-04; Institutional Peer (IPEDS) public	Personnel Ratio (73.00%)
Instructional Costs	Total instructional costs of UG FTES/# of UG FTES (and masters)	2003-04	2003-04; System Average	Undergraduate and Master's Cost per FTE Student (3.50% and 7.00%)
Faculty Terminal Degrees	# of FT permanent tenured and tenure track instructional faculty with terminal degrees/# of FT permanent tenured-tenure track instructional faculty (as of October 31.)	Fall 2004	Fall 2004; System Average	Percent of Full-time Tenured or Tenure Track Instructional Faculty (90.00%)

Note: Faculty Productivity and Instructional Cost performance funding measures do not include doctoral/first professional instruction data.

Performance Funding Program: Final Distribution of Funding Dollars by University

The Performance Funding Program provides additional financial resources to those universities who perform at relatively high levels and rewards those who focus their efforts on achieving improved performance relative to the other universities. The amount of the award for FY 2005-2006 is based on performance evaluation and divided equally by the three performance categories ($31,174,700/3=$10,391,567). Within the three performance categories, dollars are divided evenly across the eight measures ($10,391,567/8= $1,298,946). If a measure has sub-measures, the dollars for that particular measure are divided equally across sub-measures. For example from **Table 4**, Second Year Persistence has four sub-measures, where total dollars for each sub-measure equal $324,736 ($1,298,946/4) for the baseline performance category.

In the aggregate, total dollars awarded in the "exceeded" performance category will be greater than those awarded in the "met" category. To ensure this outcome, the dollars for all measure/sub-measures are distributed such that universities with performance in the "exceeded" category receive an award that is always greater per FTE student than that of those with performance in the "met" category.

Table 6 provides an example of the performance funding allocation for the sub-measure Second Year Persistence, Students Persisting – Overall. For this sub-measure, two universities were in the "exceeded" baseline category; 12 universities were in the "met" baseline category, and zero universities were "not met". Initially for each baseline, total dollars are allocated to each sub-measure, where the university receives three shares for "exceeded" and one share for "met". Thus, six shares are allocated to the "exceeded" category (3 x 2) for a 33% distribution of dollars (6/18) or $108,245. Twelve shares are allocated to the "met" category (1 x 12) for a 67% distribution of dollars (12/18) or $216,491. Note: No dollars are awarded for a performance evaluation of "not met".

The total university performance award is adjusted to university size as measured by total FTE students at the appropriate undergraduate and graduate levels. **Table 6** shows that for the two universities in the "exceeded" category for Students Persisting - Overall, the sum of their total full time equivalent student (FTES) for fall 2004 is 13,661.6 and for the "met" category, 79,772.8. By dividing dollars allocated to the "exceeded" category over the total FTES within that category, dollars per FTES for each performance category is calculated (i.e., $7.92 for "exceeded" and $2.71 for "met").

Table 6: Students Persisting – Overall ($324,736 Allocation)

	Total	Exceeded	Met	Not Met
Number of Universities in each Performance Category	14	2	12	0
Pro-Ration	3 to 1	3 x 2 = 6	1 x 12 = 12	0
Total Shares (%)	18 (100%)	6 (33.33%)	12 (66.67%)	0 (0%)
Allocation	$324,736	$108,245	$216,491	$0
Total FTES in Performance Category (Fall 2004)	93,434.4	13,661.6	79,772.8	-
Dollars per FTES	**$10.63**	**$7.92**	**$2.71**	-

Note: Figures may not total exactly due to rounding.

The initial allocation of performance funding dollars to PASSHE's 14 universities for Second Year Persistence: Students Persisting—Overall is calculated as the dollars per FTES by the total FTES for each university for the "exceeded" and "met" categories. This process is repeated for all performance funding measures and sub-measures.

To determine the final allocation of funding dollars, two adjustments have been established. First, if a SPT is "exceeded", and the baseline was initially evaluated as "not met", the baseline evaluation is changed to "met". Second, an adjustment is made for measures or sub-measures where no university performance falls in either the "exceeded" or "met" categories. The funding pool for those measures/sub-measures is evenly redistributed to the baseline, benchmark, or SPT portions of the other measures/sub-measures within "exceeded" categories for universities. **Table 7** provides the final distribution of performance funding dollars after the adjustments were implemented for Fiscal Year 2005-2006.

Table 7: Final Distribution of Performance Funding Dollars

University	Baseline	Benchmark	System Performance Target	Total
Bloomsburg	$714,432	$871,555	$1,092,095	$2,678,082
California	$620,993	$987,924	$592,869	$2,201,786
Cheyney	$152,764	$144,805	$496,938	$794,507
Clarion	$593,693	$525,766	$421,173	$1,540,632
East Stroudsburg	$411,720	$465,024	$341,949	$1,218,693
Edinboro	$802,813	$251,637	$145,858	$1,200,308
Indiana	$1,682,359	$993,863	$766,253	$3,442,475
Kutztown	$792,033	$548,897	$338,715	$1,679,645
Lock Haven	$430,660	$543,862	$147,190	$1,121,712
Mansfield	$426,578	$466,863	$130,133	$1,023,574
Millersville	$701,104	$1,263,372	$2,597,804	$4,562,280
Shippensburg	$569,596	$972,432	$1,008,197	$2,550,225
Slippery Rock	$1,142,749	$783,886	$796,865	$2,723,500
West Chester	$1,350,073	$1,571,681	$1,515,527	$4,437,281
Total	**$10,391,567**	**$10,391,567**	**$10,391,566**	**$31,174,700**

Note: Figures may not total exactly due to rounding.

Conclusion

The principal rationale for performance funding is that it provides financial incentives that encourage universities to achieve desirable goals (Burke, 2002). Nevertheless, Burke and Minassians' (2003) survey of public colleges and/or universities for 2003 reported that 67% of performance funding programs had a minimal to moderate impact, including Pennsylvania, on improved performance.

While recognizing the data are of a limited time period and scope, and other factors may impact the performance funding measures (see Burke, 2005), generally PASSHE is moving in desirable strategic directions as indicated by the 2000-2005 System total trends (see summary below). The performance funding sub-measure trends (percent or ratio only) are listed below within their Strategic Plan Goal Categories (see link for broader discussion of the trends, http://www.passhe.edu/content/?/performance):

(1) Student Achievement and Success: Second Year Persistence - Overall (1.82%) and Black and Hispanic combined (3.91%); Graduation - Four Year Overall (0.36%) and Black and Hispanic combined (3.24%); Graduation - Six Year Overall (0.70%) and Black and Hispanic combined (9.78%);

(2) University and System Excellence: Degrees Awarded - Bachelor's (1.96%); Employee Diversity 0.27%); Faculty with Terminal Degrees (4.00%);

(3) Commonwealth Service: Degrees Awarded - Masters (-1.89%); Masters Cost per FTE Student (8.56%); and

(4) Resource Development and Stewardship: Faculty Productivity (7.47%); Personnel Ratio (1.78%); Undergraduate Cost per FTE Student (5.82%).

All performance funding sub-measures except for Degree to Enrollment Ratio - Masters; Personnel Ratio; and Instructional Cost per FTE Student have improved. For Degrees Award - Masters, the number of Masters degrees increased by 17.7% over the time period, but the cohort increased relatively faster by 22%, resulting in a decline. For the Personnel Ratio and Instructional Cost per FTE Student, the costs have risen but at a slower rate than the 13.8% change in inflation (consumer price index – all urban consumers) over the same time period resulting in real declines in cost.

The Performance Funding Program has provided additional resources as a method to strengthen the System Goal Categories as presented within PASSHE's Strategic Plan. When performance funding dollars become increasingly important to an institution's overall revenue stream, universities devote both time and resources to implement strategies that will improve performance in each of the funded areas.

References

Armstrong, Thomas O.; Bohl-Fabian, Lou; Garland, Peter; and Yazdi, Khalil. (2004). The Integration of Performance Evaluation and Planning: Pennsylvania State System of Higher Education's System Accountability Report 2003-2004. *Northeast Association for Institutional Research Proceedings,* 12-20.

Borden, Victor, M.H. and T.W. Banta. (Summer 1994). Using Performance Indicators to Guide Strategic Decision Making. *New Directions for Institutional Research* 82: 95-106.

Burke, J.C., and Associates. (2005). *Achieving Accountability in Higher Education: Balancing Public, Academic, and Market Demands.* San Francisco, CA: John Wiley & Sons, Inc.

Burke, J.C. (2002). *Funding Public Colleges and Universities for Performance.* Albany. N.Y.: Rockefeller Institute of Government.

Burke, J.C., and H. Minassians. (2003). *Performance Reporting: "Real" Acountability or Accountability "Lite" Seventh Annual Survey 2003.* Albany. N.Y.: Rockefeller Institute of Government.

MGT of America, Inc. (July 12, 2001). *System Funding Formula and Performance Funding Concept Paper for the Pennsylvania State System of Higher Education.* Austin, Texas.

Office of the Chancellor. (2004). *Leading the Way, The Pennsylvania State System of Higher Education: A Plan for Strategic Directions 2004-2009.* Harrisburg: Pennsylvania State System of Higher Education.

Office of the Chancellor. (August 2005). *System Accountability Report: Performance Outcomes 2004-2005.* Harrisburg: Pennsylvania State System of Higher Education.

Peterson, M.W. and C.H. Augustine. (2000). External and Internal Influences on Institutional Approaches to Student Assessment: Accountability or Improvement? *Research in Higher Education* 41(4): 443-479.

Woodley, Sandra. (January 31, 2005). *Comprehensive Funding Review Recommendations* (Agenda Item, 67-78). Frankfort, Kentucky: Kentucky Council on Postsecondary Education.

USING FACTOR ANALYSIS TO CLARIFY OPERATIONAL CONSTRUCTS FOR MEASURING MISSION PERCEPTION

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Introduction

This paper describes a mixed methods strategy of inquiry for developing and testing factors that represent constructs of institutional mission. The primary objective of this research was to develop an instrument that measures a college student's perception of mission, in order to provide some evidence of mission effectiveness to address accreditation standards. A second objective, once an administration of the instrument was conducted and an adequate data set obtained, was to investigate the instrument's internal reliability. Third, if the instrument was indeed found reliable, the next objective was to uncover the presence within of any constructs or subscales of items. Last, if operational constructs were present within the instrument, the final objective was to observe relationships among them using correlation analysis.

The study was designed to address the following research questions:

- Are the Research Mission Questions valid and reliable measures of student perception of institutional mission?
- Are there factors present in the Research Mission Questions?
- If there are factors, what is the relationship among them?

Review of the Literature

The pace of assessment activity in United States colleges and universities has been accelerating rapidly over the past two decades. Actors in the growing accountability movement search avidly for robust indicators of higher education performance (Ewell,1998). The need is particularly acute relative to accreditation standards on mission, where performance indicators representing mission constructs are largely absent.

Chickering (1993) points out the importance for an institution to have clearly articulated objectives for student learning and development. Ideally, the objectives pervade the institution's programs and climate, and are widely shared and emphasized in oral and written communication. A strong sense of college mission that unifies the educational experience of students can reduce ambiguity and define purpose for students and others in the institution. Some of the objectives, or constructs, present in the mission statements of institutions participating in this research are shown in Appendix A.

The relationship between institutional quality, institutional characteristics like student backgrounds, and student success have been examined, but the relationship of institutional mission to student engagement and education outcomes has not been fully explored (Pike, Kuh, & Gonyea, 2002). The U.S. News and World Report's *America's Best Colleges 2005* defines an institution's mission according to its Carnegie Classification (2004, p.80), a conventionally accepted taxonomy of American colleges and universities originally devised by the Carnegie Foundation. In this research, however, "mission" is operationally defined as the cluster of institutional goals found in the mission statement of a college or university. The relation between an institution's mission goals and student engagement and learning environment are explored.

Research by Pike, Kuh, and Gonyea (2002) on institutional mission concludes that mission constructs can be measured. The methodology used by the National Survey of Student Engagement (NSSE) for producing benchmarks, or scales, of "effective educational practice" (Kuh, 2001, p.13) is mirrored by this research in the way factor scales were produced.

The purpose of the factor analytic method used here was to evaluate score validity once the measure had been developed, and focus on whether the scores measure "the correct something" (Thompson, 2004, p. 4), and are valid. Tests used in this research are meant to clarify operational constructs for an area, in this case, the measurement of student perception of institutional mission. The scores, or outcomes, of those measures can then be a means for evaluating students' perceptions of mission-related curricular and co-curricular programs on campus.

Thompson and Daniel (1996) believe that factorial validity of a test is, "given by its loadings in meaningful, common, reference factors" (p. 197). The Rotated Factor Matrix (Appendix B) shows how the test given in this research performed against that standard.

Study Limitations. This study was based on research conducted at a specific consortium of schools. Although the results may not be generalizable to other institutions, the methodology may be adapted to explorations of institutional mission at other colleges.

Data Source

The study is based on data from 3,857 first-year and senior students at fourteen schools participating in the NSSE 2004 Catholic College Consortium. The NSSE instrument, the College Student Report (CSR), was administered to the consortium sample with an added 20-item set of Research Mission Questions. Respondents were classified as first year students (N=2,000) or seniors (N=1,827) by consortium schools, and there were 1,007 males and 2,820 females. Characteristics of consortium schools are noted in Table 1.

Methodology

The overall process of developing and validating the instrument is as follows: start with a draft of the question items based on constructs found in participating institutions' mission statements (Appendix A), circulate the draft question items to participating institutions for

feedback, revise question items and obtain feedback from experts in instrument development, administer the instrument to potential subjects, and make final revisions. Once the instrument has been administered and data collected, check internal reliability, examine the item-total correlation matrix and delete items to produce the most reliable set of items, and conduct a factor analysis to explore for the presence within of reliable subscales.

Table 1
Institution Characteristics

Institution	Catholic %	Urban/Suburban	Region West/Mid/East	Selective/ More Selective*
Small				
G	64	S	E	S
N	42	U	M	S
Medium				
A	36	U	W	S
B	51	S	M	S
C	47	U	M	S
D	51	S	M	S
E	60	S	M	M
F	35	S	M	M
I	93	S	M	S
J	61	S	E	S
K	68	S	E	S
L	36	S	M	S
M	42	U	M	S
Large				
H	54	U	E	S

*Source: *America's Best Colleges 2005,* U.S. News and World Report.

To develop the Research Mission Questions for this research, the set of questions used two years prior by a different NSSE Catholic Consortium was obtained and assessed for its suitability. A few items were retained, but most items were developed specifically for this study using a qualitative research technique. The technique involved first obtaining the mission statements of the Consortium schools and probing them for shared goals and objectives related to mission. Common items were plucked out and distilled into distinct concepts. Questions that addressed these concepts were then drafted. Next, draft questions were distributed to the key contacts at the Consortium schools, usually the director of institutional research. This individual reviewed them, shared them with other administrators in some cases, and returned the draft questions with feedback and suggestions for revision. This process of review occurred in a cycle three times until the final questions were eventually approved by participating institutions. A demographic question on religious affiliation was also developed and included, since this data was important to Consortium participants.

The next step in the process of developing the instrument was to check the face validity of the questions. The question items were shown to representatives from the Student Life area at the college of the Consortium Administrator (researcher) to obtain feedback on terms and concepts used, for example, whether "charism" or "heritage" was a better term to describe the

contribution of the institution's founders. Revisions were made, and the questionnaire was then given to a group of 10 potential subjects from the undergraduate student body at the Consortium Administrator's college, either individually or in small groups. Shortly after taking the questionnaire, they were asked to share comments and suggestions for clarification or improvement of the questionnaire. For example, one subject suggested asking whether students felt free to express their individual spirituality on campus, so that was added.

In the next step, a team of experts in instrument development at NSSE was consulted. The team vetted the questions for content and construction, and made important suggestions about the Likert-scale response method and overall formatting. In all, 20 question items were developed. Some example items are:

- Ethical and spiritual development of students is an important part of the mission at this institution
- The faculty, staff, and students here are respectful of people of different races, cultures
- How important is it to you that you accomplish the following objectives?
  1) Volunteering in community service 2) Raising a family

Last, the questionnaire was once again distributed to Consortium schools and finally approved.

Results

Once the instrument was administered and data obtained, the instrument was tested using reliability analysis and factor analysis to answer the following questions: Are the Research Mission Questions valid and reliable measures of student perception of institutional mission? Are there factors present in the Research Mission Questions? If there are factors, what is the relationship among them?

To address the first question about validity and reliability, a Cronbach's alpha test was conducted on the Research Mission Questions. Items with low inter-item correlation, such as "becoming an authority in my field," and "raising a family" were removed. By repeating the steps of analysis and removal of items with low item-total correlations (<.32), the most reliable set of items was produced. A reliability analysis was conducted on the remaining 17 items, producing a Cronbach's alpha of .880 for the revised set of items. In the interest of clarity and parsimony, the 17 items were renamed the Mission Perception Inventory (MPI).

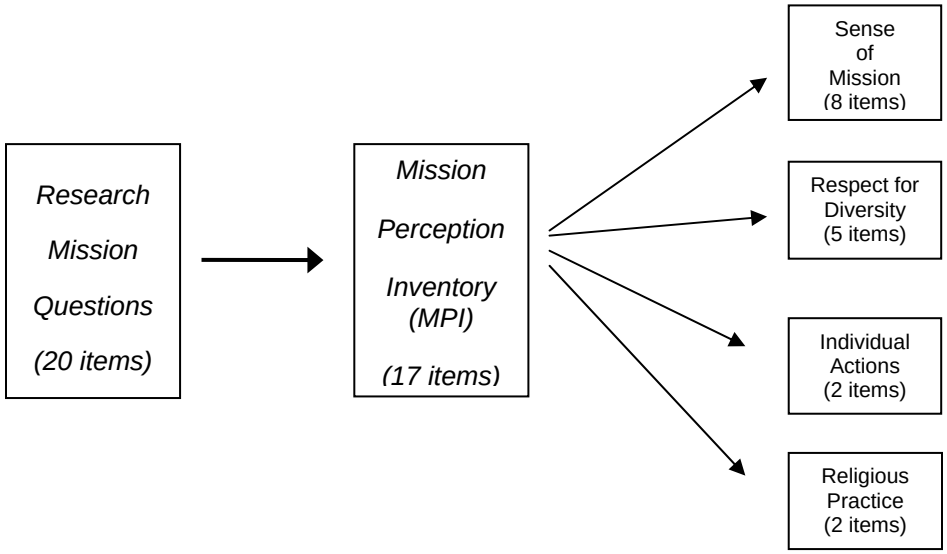
After reliability analysis, there were three important decisions to weigh before beginning the process of defining factors. First, the number of possible factors that could be produced had to be estimated and analyzed for reliability. Second, a determination was needed as to whether the underlying factors were correlated or uncorrelated (orthogonal).Third, the different types of testing options available within factor analysis needed to be assessed and the most elegant one selected. The decision was made that underlying factors were likely to be correlated.

A data reduction was needed at this juncture in order to explore the presence of a factor or factors in the MPI survey data set. Two factors are generated when Eigenvalues are not specified. Harman (1976) advises using the basic Jacobi method of, "diagonalization of the

matrix **R** by performing a sequence of orthogonal transformations on it" (p. 145), which can be achieved in the SPSS program by setting the Eigenvalue at 1.0 or greater.

Subsequently, a factor correlation analysis was performed specifying an Eigenvalue of 1.0 or greater and requesting four factors. The correlated factors solution to a Varimax rotation (Maximum Likelihood) is displayed in the Rotated Factor Matrix (Appendix B) where the values of **R** show in columns. Values of **R** indicate the reliability of the relationships between pairs of variables, and any values of **R** greater than .32 indicates a satisfactory relationship, or factor loading by items (Tabachnick, 1996). Thus, four factors are evident in the solution. The four factors were named Sense of Mission (8 items); Respect for Diversity (5 items); Individual Actions (2 items); and Religious Practice (2 items).

Figure 1:
Derivation of Mission Perception Inventory (MPI) and subscales from Research Mission Questions



To assure thoroughness of inquiry, factor scores were computed on the subscales and compared with the subscale scores. The comparison showed it was not necessary to employ factor scores for subscales in subsequent analyses, primarily because the factor score alters the basic metric of the scales and would affect their comparability with the overall Mission Perception Inventory (MPI) scale. The subscale means must be used in concert with the MPI scale means in subsequent analyses because they closely relate to the concepts found in institutional missions.

The reliability and correlations for subscales within the MPI scale are presented in Table 2. The Cronbach's alpha test indicates that the two subscales, Sense of Mission (α=.87) and Respect for Diversity (α=.85), are very reliable and internally consistent.

Table 2
Reliability and Correlation of Subscales

		Correlation	
Subscale	Cronbach$^{\alpha}$	Sense of Mission	Respect for Diversity
Sense of Mission	.867	1.000	
Respect for Diversity	.854	.581 **	1.000
Individual Actions	.674	.292 **	.166 **
Religious Practice	.624	.208 **	.089 **

**. Correlation is significant at the 0.01 level (2-tailed). N=3,827.

To address the third question about the relationship among factors, a correlation analysis was performed. As seen in Table 2, the correlation between the subscales indicates a significant relationship between Sense of Mission and Respect for Diversity (r=.581, p<.01, df=3,825). Therefore, it was concluded that the MPI subscales, Sense of Mission and Respect for Diversity, are significantly correlated with each other.

The scales most useful for further analysis are Sense of Mission and Respect for Diversity. Individual Actions and Religious Practice each have just two variables in the scale. Also, the two variables in Religious Practice are scaled dichotomously, unlike the continuous scales in the others.

Discussion

To summarize, the reliability and validity of the Research Mission Questions were tested and found to be reliable and valid measures of student perception of institutional mission. However, three items in the Research Mission Question set were found to be poorly correlated, so they were removed to produce a 17-item set of questions called the Mission Perception Inventory (MPI) (α=.88). Factor analysis of the MPI then produced four reliable subscales called Sense of Mission, Respect for Diversity, Individual Actions, and Religious Practice. Because the Individual Actions and Religious Practice scales each have just two items, only Sense of Mission (α=.87) and Respect for Diversity (α=.85), with more items and higher reliability, would be most useful to any subsequent analyses that might be conducted on the data.

Conclusions and Implications

The four subscales produced by analysis indicate the presence of those concepts in students' educational experiences at Consortium colleges. Also, the reliability of subscales indicates that the Mission Perception Inventory (MPI) can be employed with confidence as a measure of student mission perception in subsequent studies. The high reliability of the Sense of Mission and Respect for Diversity scales indicates, as well, that these scales can be used alone or in concert with other instruments to satisfactorily measure mission perception.

References

Chickering, A. (1993). *Education and Identity.* San Francisco: Jossey-Bass.

Ewell, P.T. (1998). National trends in assessing student learning. *Journal of Engineering Education.* 87(2): 107-113.

Harman, H.H. (1976). *Modern Factor Analysis* (3rd Ed.). Chicago: University of Chicago Press.

Kuh, G.D. (2001, May/June). Assessing what really matters to student learning. *Change,* 33(3), 10-17.

Pike, G. R. , Kuh, G.D., & Gonyea, R.M. (2002). The relationship between institutional mission and students' involvement and educational outcomes. *Research in Higher Education,* 44(2), 241-262.

Tabachnick, B.G. & Fidell, L.S. (1996). *Using Multivariate Statistics* (3rd Ed.). New York: Harper Collins College Publishers.

Thompson, B. (2004). *Exploratory and confirmatory factor analysis: Understanding concepts and applications.* Washington, D.C.: American Psychological Association.

Thompson, B., and Daniel, L.G. (1996, April). Factor analytic evidence for the construct validity of scores: A historical overview and some guidelines. *Educational and Psychological Measurement,* 56, 197-208.

U.S. News and World Report. (2005). *America's Best Colleges* [Electronic version]. Retrieved February 21, 2004: http://www.usnews.com/usnews/edu/college/rankings/rankindex_brief.php.

Appendix A

Mission Statement Concepts - NSSE 2004 Catholic College Consortium					
Professional Development P	***Leadership L***	***Academic Excellence A***	***Community / Service C***	***Spiritual Development E***	***Diversity D***
		The joy of learning is faithfully nurtured...power of learning.		Higher morals, and social conscience are valuable	
develop...personal competencies		Collaborative environment	Commitment to build a just and peaceful society	Develop moral character	
	Promotes leadership to local and boarded communities		Promotes service to local and boarded communities	Emphasizes on the growth of the human person	
	development of leadership	community of learning	spirit of service	promotes just and ethical relations; values	diverse ages, backgrounds, and cultures
preparation for responsible living and meaningful work		Responsible academic freedom; provides intellectual preparation		Promote moral, spiritual, religious vales to students; moral prep	
Imagination and spirit	intellect and spirit	academic excellence	Service and leadership community	Imagination and Spirit	
	Prepare for leadership	Develop intellectually	Lives of service	Develop spirit & heart; values-based education	
Prepare for professional careers	Intellect and spirit	commitment to serving others through a liberal arts education	Service opportunities in the community		diversity
professional disciplines	education empowers	calls upon students to reach their full potential…lifelong learning	leaders in service	spiritual, ethical, and religious values	live responsibly in a diverse and interdependent world
Career preparation	Responsibility for decisions	Intellectual inquiry	Commitment to service	personal growth	diversity

Appendix B

Rotated Factor Matrix – Mission Perception Inventory

	Factor			
	1 Sense of Mission	2 Respect for Diversity	3 Individual Actions	4 Religious Practice
Social and personal development of students is an important part of the mission at this institution.	.719	.266	.129	.049
Ethical and spiritual development of students is an important part of the mission at this institution.	.710	.181	.066	.169
This institution offers opportunities for volunteering and community service.	.674	.141	.149	.030
This institution offers opportunities for developing leadership skills.	.656	.271	.160	.000
At this institution, there are opportunities for students to strengthen their religious commitment.	.604	.296	.029	.131
The heritage of the founding religious community of this institution is evident here.	.601	.201	.032	.078
The mission of this institution is widely understood by students.	.515	.189	.089	.053
The professors at this institution discuss the ethical implications of what is being studied.	.477	.329	.111	.141
The faculty, staff, and students here are respectful of people of different religions.	.290	.786	.029	.064
The faculty, staff, and students here are respectful of people of different races and cultures.	.361	.747	.012	.104
Students feel free to express their individual spirituality here.	.289	.656	.064	.051
People of different sexual orientations are accepted socially here.	.119	.621	.070	-.081
The environment here encourages students to develop an appreciation of diversity.	.293	.616	.067	-.005
How important is it to you that you accomplish the following objectives? Volunteering in community service.	.185	.043	.693	.184
How important is it to you that you accomplish the following objectives? Influencing social values.	.106	.081	.649	.118
Within the past week, have you participated in a religious service?	.103	.001	.111	.660
Within the past week, have you spent time in private prayer or meditation?	.099	.024	.153	.619

OPTIMIZING THE USE OF RETENTION RESEARCH IN ASSESSMENT

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Introduction. The purpose of this paper is to demonstrate how to design, analyze and present the results of retention studies to achieve optimum relevance and use in institutional assessment. The paper is based on a longitudinal retention study of entering freshmen at a selective, private college in the northeast. The study was designed to answer two major assessment related questions.

- How successful are admission policies in selecting students who will achieve a high level of academic performance and graduate within six years?

- Controlling for input characteristics, how well do college experiences predict students' academic performance and satisfaction with their education?

Results provide a basis for assessing the effectiveness of admission policies and the impact of college experiences on graduates' academic performance and satisfaction.

Literature Review. Research on student persistence in college has assumed greater importance in today's competitive environment (Peltier, Laden & Matranga, 1999). This is particularly true with the growing demand for accountability and the increased focus on assessment in the accreditation of higher education institutions.

In Assessment for Excellence, Astin (l993) proposes the Input-Environment-Output (I-E-O) model with the creation of a longitudinal retention file as the best long-term solution for assessment. This model is based on the assumption that one needs information about the characteristics of incoming students (inputs) in order to evaluate the impact of educational programs and experiences (environment) on outcomes. The design of this retention study reflects the principles of Astin's model. Demographic variables (gender and citizenship) and admission characteristics (SAT scores and the admission rating) represent inputs. Students' self-reported academic and social college experiences comprise the environment while graduation status and cumulative averages constitute the outcomes for the model.

Environmental variables in this study are based primarily on senior survey results regarding student behaviors, self-reported gain and satisfaction. These data constitute indirect measures for assessment. Allen (2004) describes indirect techniques as reports about learning rather than direct demonstrations of learning. Ewell and Jones (l993) identified three types of indirect indicators for assessment: institutional requirements, instructional good practice, and student behaviours and self-reported gains. A rationale for using indirect measures is that they yield information with which to make sense of summative assessment findings and potentially provide clear policy leverage for action.

Utilizing senior survey results in the retention study provides an opportunity to enhance students' voice in assessment. Ewell (1983) proposed that by using student satisfaction assessment results to shape institutional reform, institutions are validating the importance of the students' "voice". Echoing this view, Lingrell (1992) observed that since the ultimate beneficiary of assessment is the student it only seems appropriate to ask the student what he or she thinks. He also identified the senior survey as an ideal vehicle for incorporating students' voice. Cheng's (2001) research provides an excellent example of how an externally developed senior survey may be used to construct a model for producing outcome measures in an institution's assessment effort.

As Cheng and Tam (l997) have observed, higher education is increasingly recognizing that it is a service industry and is placing more emphasis on meeting students' expectations and needs. In this context, student satisfaction is a crucial determinant of success. "Student satisfaction results when actual performance meets or exceeds the student's expectations" (Elliott & Healy, 2001, p.2). The present study includes student satisfaction in the retention/assessment model.

Methodology. The study is based on a six-year longitudinal file for 400 first-time, full-time freshmen who entered college in the fall of l998. Data were extracted from the administrative computer system files and merged with results from the Class of 2002 senior survey. Bivariate and multivariate techniques were utilized in the data analyses. Chi-Square analyses were used to examine relationships between demographic variables, admission characteristics and retention. Correlation analyses, t tests and analyses of variance were used to study the relationships between student characteristics, admission criteria and academic performance. Regression analyses were employed to predict students' academic performance and satisfaction with college.

Study Limitations. The study is based on research conducted at a single institution, which potentially restricts the variance for analysis and the generalizability of the findings. Further, the research was limited by a lack of information on: input characteristics; non-graduates' reasons for leaving; and student involvement in student life as well as by the absence of an integrated survey/administrative data base. The final report from the study included several recommendations designed to address these issues.

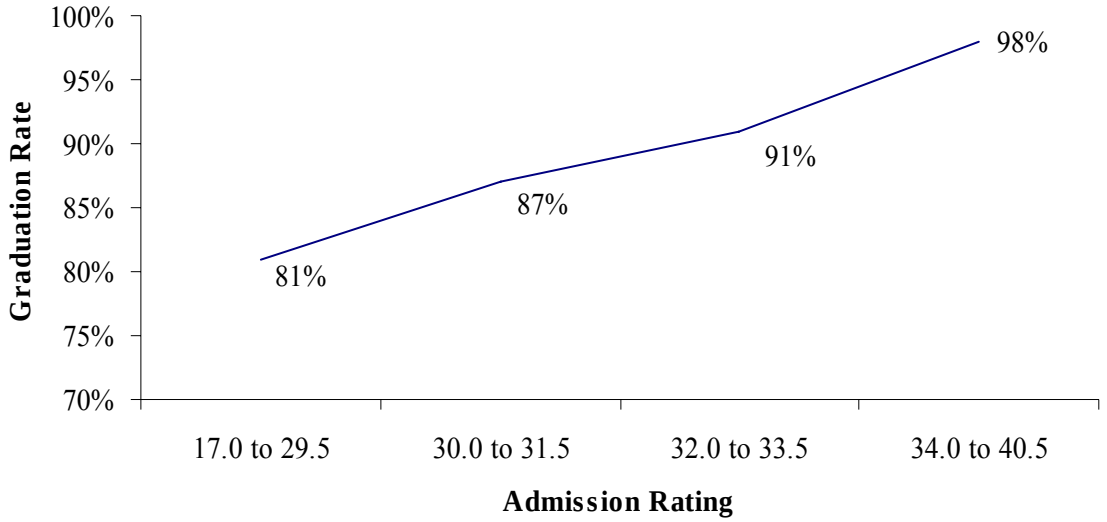
Results

Graduation Rates. The overall graduation rate for the fall l998 entering freshman class was 85.5 percent. Analysis by demographic characteristics revealed a significantly higher graduation rate of 93 percent among females, compared with 82 percent among males ($X^2 = 11.51$, $p \leq .05$). Though not statistically significant, the graduation rate was higher at 87 percent among international students, compared with 85 percent among U.S. citizens, and the graduation rate of 88 percent among financial aid recipients, exceeded the rate of 82 percent among non-financial aid recipients.

Analyses of the relationship between admission characteristics and graduation rates revealed no statistically significant differences by SAT scores. However, results did show that all non-graduates with SAT scores between 700 and 800 left voluntarily, while all non-graduates with SAT Math scores below 500 were required to withdraw. The most impressive finding regarding

admission characteristics was the strong relationship between the College admission rating and graduation rates. As shown in Figure 1, some 98 percent of entering freshmen with admission ratings of 34 or higher, compared with 81 percent of those with admission ratings less than 30, graduated.

Figure 1
Graduation Rate by Admission Rating



Academic Performance. T test analyses identified significant differences in academic performance by gender. Female annual cumulative averages, which ranged from 2.84 to 3.07, were consistently higher than the male averages, ranging from 2.66 to 2.96. The cumulative averages of U. S. citizens were somewhat, though not significantly, higher than those of international students.

Analyses of variance identified no statistically significant differences in cumulative averages by SAT Math scores. However, significant differences were found by SAT Verbal scores. For example, the first year mean cumulative average for students with scores from 700 to 800 was 3.09, compared with 2.69 for students with scores below 500 ($F = 4.37$, $p \leq .001$). Similarly, the fourth year mean cumulative average for students with scores of 650 to 690 was 3.29, compared with 3.04 for students with scores below 500 ($F = 4.01$, $p \leq .001$).

As shown in Table 1, analyses of variance also identified statistically significant relationships between the admission rating and annual cumulative averages. Students with admission ratings of 34 to 40.5 consistently earned averages of 3.10 or higher, while students with admission ratings below 30 earned averages of 2.82 or lower.

Table 1. Students' Mean Cumulative Averages by Admission Rating

Admission Rating	First Year	Second Year	Third Year	Fourth Year
34.0 to 40.5	3.10	3.13	3.20	3.28
32.0 to 33.5	2.78	2.84	2.96	3.04
30.0 to 31.5	2.64	2.73	2.88	2.96
17.0 to 29.5	2.44	2.49	2.67	2.82
F Ratio	23.59***	28.47***	24.36***	20.76***

*** $p \leq .001$

Significant correlations, from .44 to .47, were found between the admission rating and annual cumulative averages and regression results showed that the admission rating explained 21 percent of the variance in final cumulative averages. These results confirm the admission rating as an excellent indicator of potential for academic achievement.

Admission Characteristics, Academic Performance and Senior Survey Results. Further analyses were conducted to examine relationships between graduating seniors' admission characteristics, academic performance and senior survey responses. Admission data included Verbal and Math SAT scores. Academic performance was based on the annual grade point averages and senior survey data reflected graduating seniors' evaluation of their education and satisfaction with their college experience.

Chi-Square analyses identified statistically significant relationships between the admission rating and satisfaction with faculty attitude ($X^2 = 14.09$, $p \leq .05$) and re-evaluation of the college choice ($X^2 = 20.05$, $p \leq .05$). As shown in Table 2, those with the highest admission rating reported the highest level of satisfaction with faculty attitude and were most likely to report they definitely would choose the College again.

Table 2. Admission Characteristics and Senior Survey Results

A. Satisfaction with Faculty Attitude by Admission Rating

Admission Rating	Very or Generally Dissatisfied	Generally Satisfied	Very Satisfied	Total	N
34.0 to 40.5	8%	34%	58%	100%	65
32.0 to 33.5	4	47	49	100	53
30.0 to 31.5	11	60	29	100	62
17.0 to 29.5	12	38	50	100	42
Total	9	45	46	100	222

$\chi^2 = 14.09$; $p \leq .05$

Table 2. Admission Characteristics and Senior Survey Results (continued)

B. Re-Evaluation of College Choice by Admission Rating

Admission Rating	Probably or Definitely Not	Maybe	Probably Would	Definitely Would	Total	N
34.0 to 40.5	24%	12%	38%	26%	100%	66
32.0 to 33.5	38	28	25	9	100	53
30.0 to 31.5	33	27	22	18	100	63
17.0 to 29.5	26	12	48	14	100	42
Total	30	20	32	18	100	224

$\chi^2 = 20.45$; $p \leq .05$

Several statistically significant relationships were found between SAT scores and graduating seniors' perception of the impact of their education on their abilities. As shown in Table 3, generally students with the lowest SAT scores reported the highest ratings. For example, students with SAT Verbal scores less than 500 reported a mean rating of 3.48, compared with 3.10 among those with scores above 590, for the impact of their undergraduate education on their ability to think analytically and logically. Results presented in Table 3 suggest that students with lower ability on entrance may have a greater potential for improvement and therefore rate the effect of their education higher regarding the impact on their abilities and knowledge. Alternatively, those with higher SAT scores may report lower ratings due to higher expectations.

Table 3. Significant Differences in Abilities Enhanced by SAT Scores

A. SAT Verbal Scores

	Mean Rating			
Abilities	**<500**	**510 to 590**	**>590**	**F Ratio**
Competitiveness	3.53	3.23	3.19	3.05 *
Think Analytically and Logically	3.48	3.22	3.10	4.02 *
Drive to Achieve	3.43	3.30	3.06	3.60 *
Self Understanding	3.15	2.85	2.71	3.34 *
Relate to Different People	3.10	2.64	2.53	4.38 *

Table 3. Significant Differences in Abilities Enhanced by SAT Scores (continued)

B. SAT Math Scores

Abilities	≤600	610 to 650	>650	F Ratio
Acquire New Skills and Knowledge	3.74	3.56	3.47	4.23 *
Drive to Achieve	3.41	3.21	3.00	5.38 **
Think Analytically and Logically	3.33	3.25	3.03	3.33 *
Use Quantitative Tools	3.09	3.25	2.85	4.63 *
Formulate Creative Original Ideas	3.08	2.99	2.73	3.86 *

Note: These mean ratings are based on the following scale: 1 'Not at All', 2 'A Little', 3 'Moderately', and 4 'Greatly'
* $p \leq .05$; ** $p \leq .01$

Analyses of variance identified many significant relationships between students' assessment of their undergraduate education and academic performance. For example, students who perceived a stronger impact on their ability to gain in-depth knowledge of a field ($F=3.56$, $p \leq .05$) and develop intellectual self-confidence ($F=3.80$, $p \leq .05$) earned higher fourth year cumulative averages. Those who reported a greater impact on their ability to use quantitative tools ($F=3.05$, $p \leq .05$) achieved higher third year cumulative averages. Analyses of variance also identified statistically significant relationships between students' satisfaction with aspects of academic life and their annual cumulative averages. Those who were most satisfied with faculty attitude ($F=8.33$, $p \leq .001$) and academic advising ($F=4.71$, $p \leq .01$) earned the highest fourth year grade point average.

Further analyses identified significant relationships between satisfaction with aspects of college life and academic performance. Students who reported the highest level of satisfaction with the following aspects of college: sense of community ($F=3.11$, $p \leq .05$), social life ($F=6.61$, $p \leq .01$) and students' voice in policies ($F=6.77$, $p \leq .01$) earned the highest fourth year grade point averages. Those who reported the highest overall satisfaction ($F=3.26$, $p \leq .05$) also earned the highest fourth year grade point average.

Predicting Academic Performance. Two regression analyses were performed to identify predictors of students' academic performance and satisfaction with their education. In both regressions, demographic variables were entered first followed by admission characteristics and college experience variables. Table 4 presents results from the regression analysis predicting students' final grade point average.

Table 4. Multiple Regression Results: Predicting Final Grade Point Average

Predictors	Beta Coefficient	t Ratio	R2	F Ratio
Demographic Variables				
Gender	-.01	-.14		
Citizenship	.04	.80	.01	.68
Admission Variable				
Admission Rating	.09	1.97***	.23	20.97***
College Experience Variables				
First Year Fall Grade Point Average	.74	16.17***		
Satisfaction with Academic Advising	.10	2.63**		
Satisfaction with Faculty Availability	.11	2.72***	.69	77.69***

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

As shown in Table 4, among the demographic and admission variables, only the admission rating was a significant predictor of final grade point average. The beta coefficient of .09 indicates that for every one unit change in the admission rating, there was a .09 unit change in the grade point average. As reflected in the beta coefficients, the strongest predictors of final grade point average were the college experience variables, including the first year fall semester cumulative average (b = .74), followed by satisfaction with academic advising (b = .10) and faculty availability (b = .11). The R^2 of .69 indicates that these variables explained 69 percent of the variance in the final grade point average.

Predicting Overall Satisfaction. Table 5 presents results from the second regression analysis predicting graduating seniors' overall satisfaction with their undergraduate education. As shown, citizenship was a significant predictor. The negative coefficient indicates that domestic students were more satisfied than international students. As denoted by the significant beta coefficients, students who perceived a greater impact of their education on their intellectual self-confidence (b=.21) and their ability to acquire new skills and knowledge (b=.15) were more likely to be satisfied. Similarly, students who expressed a higher level of satisfaction with faculty attitude (b=.13), the quality of business instruction (b=.13) and sense of community (b=.12) were also more likely to be satisfied with their undergraduate education. As indicated by the R^2 of .28, these variables explained 28 percent of the variance in graduating seniors' overall satisfaction.

Table 5. Multiple Regression Results: Predicting Overall Satisfaction

Predictors	Beta Coefficient	t Ratio	R2	F Ratio
Demographic Variables				
Gender	.09	1.38		
Citizenship	-.16	-2.66**	.05	5.16**
Perceived Impact of College				
Intellectual Self-Confidence	.21	2.94**		
Ability to Acquire New Skills and Knowledge	.15	2.09*	.22	16.14***
Satisfaction with College Experiences				
Faculty Attitude	.13	1.99*		
Quality of Business Instruction	.13	1.96*		
Sense of Community	.12	1.97*	.28	11.85***

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$

Discussion

Results from this study bear important implications for policy and planning. The strong relationship found between the admission rating and graduation rate indicates that lowering the admission rating criterion would potentially lower the institution's retention rate. The relationship found between SAT scores and retention is also important since all non-graduates with high SAT scores left voluntarily. Exit or follow-up interviews should be conducted to determine why the institution is losing these high quality students. Also notable is the fact that all non-graduates with SAT Math scores below 500 were required to withdraw. This finding suggests that an SAT Math score of 500 might be the appropriate minimum criterion for acceptance.

Correlation and regression analyses validated the admission rating as an excellent indicator of potential for academic achievement and willingness to choose the same institution again. These findings identify the admission rating as a reliable measure for selecting students who are most likely to succeed academically and be satisfied with their college experience at this institution.

Results from analyses of the relationship between SAT scores and senior survey results demonstrate the importance of including input characteristics in a retention/ assessment model. Generally students with the lowest SAT scores reported the highest rating for the impact of their education on various abilities, including using quantitative tools, thinking analytically and formulating creative ideas. These results imply that perceived impact may be affected by

students' abilities. Lower ability students may have greater potential for improvement and therefore may report higher ratings, while high ability students may have higher expectations and consequently may report lower ratings. Understanding this relationship is important in analyzing trend data. As the quality of the student body increases, students' assessment of their education may decrease. Therefore, it is necessary to control for input characteristics in analyzing outcome measures.

Regression results identified student characteristics, perceived assessment and college experiences as significant predictors of academic performance and satisfaction with college. Clearly, the strongest predictor of the final grade point average was the first year fall semester grade point average. Other significant predictors were satisfaction with academic advising and faculty availability. These findings imply that the college should carefully monitor first semester grades and seek to increase satisfaction with advising and faculty availability to promote high academic performance.

Regression results also identified perceived assessment of the college's impact on intellectual self-confidence and ability to acquire new skills and knowledge and satisfaction with the quality of business courses, faculty attitude and sense of community as significant predictors of students' overall satisfaction. These findings indicate that the College should strive to enhance these personal, social and academic factors to foster increased satisfaction with the college experience.

Recommendations

As noted previously, the organization of institutional data limited the scope of this study. Therefore, the final report concluded with several recommendations designed to promote the development of a more comprehensive retention/assessment model; enhance the efficiency of the process; and expand the capacity for conducting research with the College's administrative data. Illustrative recommendations included the following:

- The Admission and/or Registrar Office should maintain admission data on the computer system file for each entering class for at least a six year period.

- The student administrative file should be expanded to include summary information regarding students' involvement in co-curricular activities.

- The College should develop a system for using a common ID on major institutional surveys and administrative student files.

- The current model for this retention study should be expanded to create a comprehensive model for indirect assessment studies.

Conclusions

Substantive findings include confirmation of the admission rating and SAT Verbal scores as valid indicators of potential for academic achievement; the significance of first semester grades and satisfaction with academic advising and faculty attitude to academic performance; and the relevance of student satisfaction with faculty attitude, the quality of business courses and sense of community to overall satisfaction. Finally, results showing that students with lower SAT scores report a greater impact of their education on their abilities emphasize the need to include input characteristics in a retention/assessment model in order to control for entering characteristics in assessing outcomes.

References

Allen, M. (2004). *Assessing academic programs in higher education*. Bolton, MA: Anker Publishing Company.

Astin, A. (1993). *Assessment for excellence*. Phoenix, AZ: American Council on Education and the Oryx Press.

Cheng, D. X. (2001). Assessing student collegiate experience: Where do we begin? *Assessment & Evaluation in Higher Education, 26*(6), 525-538.

Cheng, Y.C. and Tam, M. M. (1997). Multi-models of quality in education. *Quality Assurance in Education*, 5, 22-31.

Elliott, K.M. and Healy, M. A. (2001). Key factors influencing student satisfaction related to recruitment and retention. *Journal of Marketing for Higher Educa*tion, 10 (4), 1-11.

Ewell, P. T. (1983). *Information on student outcomes: How to get it and how to use it.* Boulder, Colorado: National Center for Higher Education Management Systems (NCHEMS).

Ewell, P. T., and Jones, D. P. (1993). Actions matter: The case for indirect measures in assessing higher education's progress on the national education goals. *The Journal of General Education, 42*(2), 123-148.

Lingrell, Scot A. (1992). *Student outcomes assessment: The senior survey* (Report No. HE 025950). Bowling Green, OH: Bowling Green State University. (ERIC Document Reproduction Service No. ED351897)

Peltier, G. L., Laden, R., & Matranga, M. (1999). Student persistence in college: a review of research. *Journal of College Student Retention* 1 (4), 357-375.

ACTUAL STUDENT LEARNING OUTCOMES: BREAKING THROUGH TO INSTITUTIONAL VISIBILITY, CLARITY, AND RICH MEANING

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Abstract

Institutions of higher education struggle to find ways to do effective, consistent, regular assessment of actual student learning, even as their faculties grow in understanding of assessment practices at the classroom level. One main barrier to such an institutional level of outcomes assessment is the lack of a model for applying available tools and practices of data gathering, to the otherwise individualistic practices of classroom based education.

This work share will introduce a project currently piloted by at least nine colleges in the U.S. this year including Quinebaug Valley Community College, Danielson CT. The project aims to engage faculty and their institutions in the process of defining and consistently assessing learning outcomes in and across disciplines, through the use of an emerging model and tool of distributed data gathering.

An Assessment Project in Context

In the fall of 2004, faculty at Quinebaug Valley Community College (QVCC), with a headcount of 1,690 and an FTE of 914, began a pilot project in learning outcomes assessment that involves the gathering of data about actual student learning-outcomes in a range of diverse disciplines. Using a web-enabled, database-driven system, nineteen full-time faculty (out of 24 who teach at the college) identified a focused selection of intended learning outcomes for the purposes of this data-gathering process. The faculty linked outcomes to assignments already a part of their courses, and developed a common set of assessment standards or rubrics. With these, they have begun to assess in a comprehensive way the actual learning achievements demonstrated by students in their respective classes. In this pilot, QVCC joins at least eight other colleges, each of which has begun to use the eLumen software during the 2004-2005 academic year (Donohue-Lynch, 2005). These include Rochester Community and Technical College, Roch, MN; Hershberger College of Business, St. Cloud State U.; Normandale Community College, Bloomington, MN; North Dakota State College of Science, Wahpeton, ND; Anoka Ramsey Community College, Cambridge, MN; Concordia U., St. Paul, MN; Kirkwood Community College, Cedar Rapids, IA; Northwest Technical College, Bemidji, MN.

At QVCC, this process has built on nearly ten years of prior efforts among the faculty to develop what in the words of assessment practitioners has been called a "culture of assessment."(Lakos and Phipps 2002; Carter 2004) Over that prior period, faculty had been engaged in a range of individual and group strategies that at least to some may have seemed like

little more than discontinuous trendy preoccupations, faculty driven or otherwise. This apparent discontinuity has in fact been a particularly persistent and important symptom not just for Quinebaug Valley Community College but for many other institutions as well, poorly understood as hardly more than a sign of academia being prone to the latest professional fads. This challenge has been discussed in positive terms in a key work by Costa and Kallick (1995).

The resource used in the current project at QVCC however-- a data collection and reporting system--gives faculty individually and collectively a practical way to move from an *ideology* of consistent, regular, cross disciplinary learning outcomes assessment (Berlin and Donohue-Lynch 1999), to the actual *practice* of such assessment. In other terms, this tool provides a comprehensive and systematic framework within which these seemingly discontinuous and diverse efforts find a new coherence and practical utility for the improvement of teaching and learning.

An Emerging Framework

The software in use at the college is called "eLumen Achievements," and is one of a number of recently emerging solutions for such a comprehensive, ***systems approach*** to learning outcomes assessment (Steele and Parrinello, 2005; Tibrewal and Sobh, 2004; Pillaninayagam 2004).[1] As such it does not do assessment itself, but instead provides a tool, (very much the way that a spreadsheet is now an indispensable tool in bookkeeping and accounting) through which faculty can both individually and collectively gather meaningful data from what they already do in their teaching and curriculum development. In this, it depends on and draws from already-occurring efforts such as classroom assessments (Angelo and Cross 1993), course-embedded assessments, traditional (and non-traditional) course projects, and even co-curricular activities, that any faculty would wish to track in a consistent and regular way. Likewise, it also calls for, relies on, and contributes to an effective mapping of curriculum within and across which such assessments are carried out (Stiehl and Lewchuk 2002a, 2002b, 2005).

As most faculty have quickly discovered in the early stages of this project, once the question of learning outcomes is opened within a broader systemic framework, it challenges and encourages them to look in two simultaneous directions--within their own disciplines, and across disciplines. Each discipline area in fact now has a framework and a language within which to ask "what specifically should students demonstrate that they have learned through the courses we expect them to take?" At the same time faculty across disciplines have this as a shared framework as well, within which to identify and assess any subsequent achievements students demonstrate, wherever they occur (Schuyler 1998).

Suddenly, potential learning outcomes look like things that could happen (or could be deliberately cultivated) in a variety of places rather than exclusively in one discipline or another, and the database in use gives a practical way to keep track of such outcomes wherever they are assessed. Imagine for example, students demonstrating clearly assessed writing achievements in a cultural anthropology class--and these being recorded in a comprehensive database (Ah! "Writing Across the Curriculum"!). Or imagine richly demonstrated and assessed achievements

related to cross-cultural understanding in a Fine Arts course; or the same for critical thinking skills in one or more places, and so on.

Further, with the resulting data, curriculum can be evaluated for its integrity and effectiveness, and subsequent planning can be carried out to improve offerings where gaps in the curriculum appear, both within and across disciplines, majors, programs, and degrees. As well, each student eventually will likewise have her/his own individual data in the form of "learning outcomes transcripts," to show not only what courses they have taken or what grades they received in their academic career, but most importantly what actual learning outcomes they have achieved and to what degree of quality or depth.

Of course, while the eLumen Achievement software is QVCC's current tool of choice for this project, it is the more general point that is key here: whether we choose eLumen or some other such software yet to be developed, it is ultimately the inherent capability within the software that is new and that brings assessment to a new level of coherence. This capability finally allows practitioners of assessment (which is just about anyone who teaches) to get beyond the accumulation of anecdotes and learning artifacts that demonstrate actual student learning achievements, to the systematic and consistent gathering of learning outcomes data that can then be made available in meaningful reports.

The Pilot Project and Beyond

Actual data-gathering in the Quinebaug Valley Community College project was off to a slow start after the first two semesters (fall 2004, spring 2005). While this was disappointing on one hand, resulting in initially sparse data, some of the reasons for this, on the other hand were actually quite encouraging. A number of faculty, for example, who had already engaged in the preliminary definition of intended outcomes, potential assessments and related rubrics, found that after they had gotten to the point of finally assessing actual student achievements using what they had initially set up, they now saw their work with a new perspective. As a result, they felt that they already needed to go back and redesign assessments and rubrics with more precision and clarity. Several faculty in fact independently began to rethink how they were approaching the project, and before they even input their fall 2004 data, began working to redesign and improve their approach for the spring semester. At least one other participant used the whole setup process itself as a way to engage the faculty in his area (Fine Arts) in a thorough program review and revision which continued into the spring 2005 semester.

At the same time, even before any learning outcomes data had been entered into the database, the project could produce information that the college never had before in an easily accessible form: just from the preliminary setup of the eLumen system and the initial participating classes, the college now had an active database of intended learning outcomes, and a growing library of potential assignments that could be used to demonstrate and assess those learning achievements, mapped to current courses and programs. This in itself will be a growing part of the project as new courses are involved in assessment and new assignments are defined, toward further intended learning outcomes.

Meanwhile, broader, key dimensions of an holistic, systemic process of assessment are also well in place as part of the necessary language and practice within which a tool such as eLumen makes comprehensive sense. These dimensions include:

- A respect for the professional autonomy of those who design curriculum and implement it in the classroom (Costa and Kallick 1995)
- A practical respect for the individuality of students—in their diversity of learning styles, learning barriers and strengths, college and life-goals, and life experience (Bain 2004; Leamnson 2001;Schuyler 1998; Tagg 2003; Workgroup 1997)
- The language and practice of "continuous improvement" (Freed 1997; Hatfield 1999)
- The shift in language from what we (as teachers and administrators) do, to what students should actually learn (Schuyler 1998)
- The identification and mapping of intended "learning outcomes" within and across curriculum (Berlin and Guan 1999; Stiehl and Lewchuk 2005)
- The establishment of standards of assessment (rubrics) of students' work, in verifying and tracking actual learning achievements
- The practice of assessment within classes and courses
- Dialogue among faculty to encourage and support the ongoing development of institution-wide assessment, within and across disciplines (NEEAN)[2]

An Emerging Model of Assessment

The ongoing challenge is to continue to develop effective, ground-level (local) practice of learning-outcomes assessment that at the same time relates to the wider institution within which it occurs. One key risk in this is the potential for constraining the professionalism and autonomy of those who teach (often expressed in the language of "academic freedom"), while answering the growing call for "accountability" in higher education (Baker 2005; Petrides 2004; Smith and Ruff 1998). The opposite risk is the ongoing lack of an institutionally relevant and coherent approach to assessment, as individual autonomy is protected and defended. A tool such as eLumen does not automatically protect against either of these extremes, but it does in fact provide a data-gathering instrument that in its very structure and function reflects the qualities of individual autonomy in the local practice of teaching, and systemic coherence at the institutional level about which we are concerned.

The emerging model of learning-assessment represented and made more practicable by a tool such as eLumen is something that could not have been implemented easily before the advent of relational databases. Now that we have these, we are able to engage a broad range of data-gathering participants, few of whom ever need to understand the workings of the whole system. People can be expert in their own areas, for defining standards, developing effective assessments, creating benchmarks, and more; they can also work with other disciplines to clarify standards and intended outcomes. The underlying system doesn't require that everyone understand the whole "big picture" of institutional assessment, curriculum mapping, or the structure of the database itself. At the same time, it gives people the flexibility and the potential for seeing and working on aspects of this "big picture," as these emerge from the data that is eventually gathered.

The logic of such an holistic system—and its practical development in something like eLumen—seems sound. It is in fact a taken-for-granted model of distributed data gathering that is behind so many functions of everyday life today. Even within higher education itself it is a growing and indispensable model behind many aspects of student information management. And yet we lag in the extreme in any practical application of this model for the task of effective learning outcomes assessment.

What is called for now are practitioners who can evaluate examples of systems such as eLumen both for their theoretical grounding as well as for their practical utility. Especially within the community college setting where the two-year focus of the institution challenges faculty in almost every discipline to think across typical academic boundaries, such a tool seems to offer a practical way to cross those boundaries while assessing and maintaining the institutional integrity of what we offer. The "proof of concept" will be in the data we eventually gather. The data will emerge if we implement and refine the right tools. The tools are beginning to take shape, and call for people with enough of an holistic vision of learning-outcomes assessment to recognize their emerging and potential value.

References Cited

Angelo, Thomas and Patricia Cross
1993 Classroom Assessment Techniques: A Handbook for College Teachers. San Francisco: Jossey-Bass.

Workgroup, APA
1997 Learner-Centered Psychological Principles: A Framework for School Redesign and Reform. From http://www.apa.org/ed/lcp.html

Baker, Ronald L.
2005 Assessment in Context: A Systems Approach to Educational Effectiveness. Phoenix: League for Innovation in the Community College.

Bain, Ken
2004 What the Best College Teachers Do. Cambridge, Mass.: Harvard U. Press.

Berlin, Delia and Brian Donohue-Lynch, eds.
1999 Outcomes Assessment Manual. Danielson, CT: Quinebaug Valley Community College. Electronic document, http://www.qvcc.commnet.edu/brian/outcomes/

Berlin, Delia and Yi Guan
1999 Learning Outcomes Assessment Record: Linkages Between Intended Programs Outcomes and Program Requirements. Electronic document, http://www.qvcc.commnet.edu/groups/outcome/index.html

Carter, Elizabeth
2004 Outcomes Assessment in a College Library: An Instructional Case Study. *In* Outcomes Assessment in Higher Education. Peter Henron and Robert E. Dugan, eds., pp 197-217. Westport, CT: Libraries Unlimited.

Costa, Arthur L. and Bena Kallick, eds.
1995 Assessment in the Learning Organization: Shifting the Paradigm

Alexandria, VA: Association for Supervision and Curriculum Development.

Donohue-Lynch, Brian
2005 A Pilot Project in Learning Outcomes Assessment (2004-2005). Electronic document, http://www.qvcc.commnet.edu/brian/sacc05

Freed, Jann E. et al.
1997 A Culture for Academic Excellence: Implementing the Quality Principles in Higher Education. ERIC Digest. Electronic document, http://www.ericdigests.org/1997-4/quality.htm

Hatfield, Susan R.
1999 Department Level Assessment: Promoting Continuous Improvement. Idea Paper, 35. Manhattan, KS: IDEA Center.

Lakos, Amos and Shelley Phipps
2002 Defining a Culture of Assessment. University of Arizona. Electronic document, http://personal.anderson.ucla.edu/amos.lakos/assessment/CulAssessToolkit/Assessdef3-new.pdf

Leamnson, Robert
2001 Thinking About Teaching and Learning: Developing Habits of Learning with First Year College and University Students. Sterling, Virginia: Stylus Publishing.

NEEAN, NEASC
2004 Dialogues in the Disciplines: A Workshop for Faculty on Discipline Based Assessment. Psychology, Sociology, Political Science. Apr. 23. Sponsored by the New England Educational Assessment Network.(NEEAN) And the New England Association of Schools and Colleges (NEASC)

Pillainayagam, George
2004 Assessment of Student Learning Using a CAR (Course Assessment Record). Paper presented at The League for Innovation Learning Summit, Baltimore.

Petrides, Lisa
2004 Turning Knowledge into Action: What's Data Got to Do With It? Phoenix: League for Innovation in the Community College.

Schuyler, G.
1998 A Paradigm Shift from Instruction to Learning. Los Angeles: ERIC Clearinghouse for Community Colleges. Electronic document, www.geis.ucla.edu/digests/dig9802.html

Smith, D. R. and D. L. Ruff
1998 Building a Culture of Inquiry: The School Quality Review Initiative. *In* Assessing Student Learning: From Grading to Understanding. David Allen, ed. Pp 164–182. New York: Teachers College Press.

Steele, Karen and Emil Parrinello
2005 Using an Access Database to Facilitate Development and Sharing of Assessment Techniques. Poster Presentation at 2005 Innovation Conference, League for Innovation. New York, N.Y.

Stiehl, Ruth and Les Lewchuk
2002a The OUTCOMES Primer:Reconstructing the College Curriculum 2e. Blaine, WA: The Learning Organization.
2002b Reconstructing the College Curriculum. League Abstracts: World Wide Web Edition 5 (6). Electronic document, http://www.league.org/publication/abstracts/learning/lelabs0602.html
2005 The MAPPING Primer:Tools for Reconstructing the College Curriculum. Blaine, WA: The Learning Organization.
Tagg, John
2003 The Learning Paradigm College. Bolton, Mass.:Anker Publishing.
Tibrewal, A. and T. Sobh
2004 An Electronic Web-Based Assessment System. Paper presented at the annual New England Association of Schools and Colleges (NEASC) Fall Forum, November,Bentley College, Waltham, Massachusetts. Electronic document, http://www.bridgeport.edu/~sobh/ Assessment Website: http://assesseng.bridgeport.edu/

[1] One other example of such emerging technologies is the Open Source Portfolio Initiative. Though it focuses on the development of electronic portfolios, it is a project that aims beyond this toward an integration of learning outcomes assessment, within an opensource solution. http://www.theospi.org/

[2] On April 2004, the New England Educational Assessment Network (NEEAN) in conjunction with the New England Association of Schools and Colleges (NEASC) held a first-ever regional workshop for college teachers in the social and behavioral sciences to come together for discussions about how and what to assess within these disciplines. As most participants in the sociology section also covered anthropology at their institutions, it too became part of the workshop. This was the first time most participants had ever had such discussions with colleagues at other colleges and universities, and the experience pointed out to most participants the need for further such dialogue.

AN ANALYSIS OF GRADUATION RATES AND EXPENDITURES AT PEER INSTITUTIONS

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Summary

A dataset of public institutions located in medium sized cities was selected from the National Center for Education Statistics' (NCES) IPEDS (Integrated Post-secondary Education Data System) database. The dataset consisted of the graduation rates of the 1997 first-time full-time cohort, the ethnic breakdown of the student population, and expenditure data for the six years fiscal 1998 through 2003. An analysis of the contribution to the graduation rates provided for by categories of expenditure data showed the greatest impact emanated from the dollars spent in academic support and student services. Because the data set contained a heterogeneous sample, consisting of doctoral degree granting and baccalaureate degree as highest degree institutions, a sub-sample of master's degree institutions was selected from the data set and analyzed. Although the amount of variance explained in the graduation rates was attenuated by the selection of this sample, the model obtained statistical significance and explained over 30% of the graduation rates among these institutions. The data showed the greatest amount of variability in graduation rates was explained by the expenditures in the area of academic support; the minority enrollment profile of the class significantly and negatively impacted on the graduation rates, and for every $1 million spent in the area of academic support graduation rates increased by .13%; for every $1 million spent in the area of student services graduation rates increased by .16%.

A comparison of the percentages of expenditures apportioned to all the categories by total sample, the Master's institutions and the Master's institutions with graduation rates above the median of 38% showed differences in the areas of research and public service—greater percentages at the total sample—academic, institutional, and instructional support—more at the Master's-granting institutions.

Methodology

Using the IPEDS Peer analysis tool, 190 institutions were selected from the IPEDS database. They were selected on the basis of a "lynchpin" institution and the criteria of being located in a city of less than 250,000 people and under public control, as submitted on the IPEDS Institutional Characteristics form in fall 2004. This file was combined with a file of institutions previously selected by the lynchpin institution's President's cabinet. The resultant file of 223 institutions was analyzed utilizing an agglomerative cluster method based on degree of urbanization of the institutions (i.e., located in a medium sized city of less than 250,000 people), Carnegie classification (classification 21: Master's I institutions), and percent of fall 2003

enrollment that was African American, Hispanic, and Native American[1]. The institutions found to be similar to the lynchpin based on the squared Euclidean distance were:

Auburn University-Montgomery
California State University-Bakersfield
Colorado State University-Pueblo
Columbus State University
Northeastern Illinois University
Kean University
Saint Peters College
CUNY Hunter College
Cameron University
Texas A & M University-Corpus Christi
The University Of Texas
Of The Permian Basin
Troy State University-Montgomery
California State University-San Bernardino
Florida Atlantic University-Boca Raton
Macon State College
Indiana University-Northwest
Rutgers University-Newark
New Mexico State University-Main Campus
SUNY College At Old Westbury
Francis Marion University
University Of Houston-Victoria
Texas Woman's University

In an effort to assess the extent to which operating expenses may affect one aspect of institutional effectiveness—graduation rates—an analysis regressing the rates onto academic support, institutional support, student services, research, public service, and instruction expenses (definitions are in the appendix), as contained in the IPEDS data base, was performed utilizing the entire data file (of the 223 institutions in the file, only 168 supplied complete data and were used in the analysis). It was found that the mean graduation rate of the 1997 first-time full-time cohort for all 168 institutions was M=44.3 (sd.=17.74) (table 1—the amounts in table one for the expenditure means are in millions of dollars, i.e., the mean for student services was $67,412,100). The average size of the cohorts in the population was M=1500; sd.=1371: median=998; range 6809, min=6, max=6515. The expense data used were the totals from six years as reported in the IPEDS surveys for 1998 through 2003 (descriptive statistics for these variables are found in table 1). A preliminary analysis of the expense categories found they were all positively and significantly correlated. In order to minimize the redundancy among the categories in constructing a predictive model each categories was regressed onto graduation rate to asses their unique contributions. Iteratively subjecting the data file to a regression procedure[2] with a different expenditure data category allowed for the elimination of three categories: instruction, public service, and research. Public service and research did not obtain statistically significant correlation coefficients with the graduation rate data and had large predictive errors (i.e., large "least squares residuals"). The instruction category, although statistically significant, also had large predictive errors and was highly correlated with the academic support category, which had low residual errors. When the four remaining categories were regressed onto the graduation rates three were found to have positive impacts and obtained statistical significance (table 2). The model accounted for approximately 52% of the variation in graduation rates;

[1] A similar analysis was performed that included Asian/Pacific Islander, but the list included institutions such as UCLA, which have large numbers of high performing Asian students. For that reason, "minority" enrollment was limited to African American, Hispanic and Native American.

[2] Stepwise methods entail each predictor variable being entered individually and tested for its impact on the dependent variable. If the predictor does not obtain statistical significance it is not included in the final model. The judgment of parsimony was made by saving the residuals of the regression models and observing the variance of the residuals and the amount of change in the R sq accompanying the inclusion of the individual variables. If a variable caused the variance of the residual scores to increase and did not provide for a statistically significant change in the R sq, the variable was not included in the final model.

however, as selected through the stepwise procedure, academic support expenditures accounted for 49% of the variation and student services and institutional support accounted for 2% and 1%, respectively (table 3). Table 2 also alludes to $3.9 million over six years, or approximately $650,000 per year, directly contributing to increasing the graduation rate at these institutions [3](B coefficients in table 2). Similarly, approximately $670,000 of the monies provided for student services and $570,000 of the amount for institutional support increased graduation. The entire model obtained statistical significance F(3,164)=60.77; p=.000 (table 4). The stability of the estimates of the regression coefficients, i.e., an estimate of the generalizability across samples, shows academic support to be the most stable estimate assessed by the narrowness of the width of the 95% confidence interval (table 2).

Table 1.

Descriptive Statistics

	Mean	Std. Deviation	N
Graduation rate of full-time students - 1997 cohort	44.43	17.737	168
Student Services	67.4121	69.37674	168
Academic Support	129.7332	172.20928	168
Institutional Support	113.8019	116.48951	168

Table 2.

Coefficients(a)								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Step 1	(Constant)	35.07	1.23		28.57	0.00	32.65	37.49
	Academic Support	0.07	0.01	0.70	12.65	0.00	0.06	0.08
Step 2	(Constant)	33.32	1.35		24.72	0.00	30.66	35.99
	Academic Support	0.05	0.01	0.44	4.10	0.00	0.02	0.07
	Student Services	0.08	0.03	0.30	2.85	0.00	0.02	0.13
Step 3	(Constant)	32.38	1.42		22.83	0.00	29.58	35.18
	Academic Support	0.03	0.01	0.29	2.28	0.02	0.00	0.06
	Student Services	0.06	0.03	0.25	2.23	0.03	0.01	0.12
	Institutional Support	0.03	0.02	0.23	1.99	0.05	0.00	0.07
A	Dependent Variable: Graduation rate of full-time students - 1997 cohort							

[3] (.03)(129.7)=3.9; 3.9/6=.65.

Table 3.

Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.701[a]	.491	.488	12.692	.491	160.139	1	166	.000
2	.718[b]	.515	.509	12.427	.024	8.149	1	165	.005
3	.726[c]	.526	.518	12.317	.011	3.974	1	164	.048

a. Predictors: (Constant), Academic Support

b. Predictors: (Constant), Academic Support, Student Services

c. Predictors: (Constant), Academic Support, Student Services, Institutional Support

d. Dependent Variable: Graduation rate of full-time students - 1997 cohort

Table 4**.**

ANOVA[d]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	25796.148	1	25796.148	160.139	.000[a]
	Residual	26740.215	166	161.086		
	Total	52536.363	167			
2	Regression	27054.620	2	13527.310	87.592	.000[b]
	Residual	25481.743	165	154.435		
	Total	52536.363	167			
3	Regression	27657.507	3	9219.169	60.772	.000[c]
	Residual	24878.856	164	151.700		
	Total	52536.363	167			

a. Predictors: (Constant), Academic Support

b. Predictors: (Constant), Academic Support, Student Services

c. Predictors: (Constant), Academic Support, Student Services, Institutional Support

d. Dependent Variable: Graduation rate of full-time students - 1997 cohort

Adding enrollment data

The percentages of Black/Hispanic/Native American students (“blaminhisp”) were combined into a single variable and entered into the regression model. The model was constructed hierarchically at this point, entering the ethnic variable first, as a controlling variable because, at least anecdotally, institutions with large minority enrollments are seen as having lower graduation rates, and because it was a criterion in institution selection. The expenditure data were entered again in a stepwise fashion. The results show the percentage of minority students negatively impacted the graduation rates, B=-.026; t=-4.81; p=.00 (table 5). Table 5 also shows academic support statistically provided the greatest impact of the expenditure components because it was selected through the stepwise method as the next variable entered into the model, positively affecting graduation rates, B=.07; t=11.91; p=.00 (table 5, step 2). In this model, however, institutional support precedes student services in entry into the model. However, the magnitudes of these coefficients were attenuated by the addition of the enrollment characteristics. This may be the result of the instability of the coefficients obtained in the previous model (table 5).

The ethnicity data accounts for approximately 12% of the variation in the graduation rates (table 6: Rsq=.123). With the addition of the academic support data 41% more of the variation is explained (Rsq. Change=.406), and institutional support and student services expenditures contribute 2% and 1% respectively (table 6). The complete model is found to be statistically significant at F(4,163)=52.22; p=.000.

Table 5

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
Step 1	(Constant)	50.22	1.76		28.54	0.00	46.74	53.69
	blaminhisp	-0.26	0.05	-0.35	-4.81	0.00	-0.36	-0.15
Step 2	(Constant)	38.96	1.60		24.32	0.00	35.80	42.13
	blaminhisp	-0.14	0.04	-0.20	-3.61	0.00	-0.22	-0.07
	Academic Support	0.07	0.01	0.65	11.91	0.00	0.06	0.08
Step 3	(Constant)	37.30	1.67		22.30	0.00	34.00	40.61
	blaminhisp	-0.15	0.04	-0.20	-3.76	0.00	-0.23	-0.07
	Academic Support	0.04	0.01	0.39	3.64	0.00	0.02	0.06
	Institutional Support	0.05	0.02	0.30	2.86	0.00	0.01	0.08
Step 4	(Constant)	36.25	1.74		20.87	0.00	32.82	39.68
	blaminhisp	-0.14	0.04	-0.19	-3.62	0.00	-0.22	-0.06
	Academic Support	0.03	0.01	0.26	2.09	0.04	0.00	0.05
	Institutional Support	0.04	0.02	0.24	2.22	0.03	0.00	0.07
	Student Services	0.05	0.03	0.21	2.02	0.05	0.00	0.11
a	Dependent Variable: Graduation rate of full-time students - 1997 cohort							

Table 6

Model Summary(e)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
Step 1	.350(a)	.123	.117	16.664	.123	23.181	1	166	.000
Step 2	.727(b)	.528	.523	12.255	.406	141.952	1	165	.000
Step 3	.742(c)	.551	.543	11.997	.022	8.178	1	164	.005
Step 4	.749(d)	.562	.551	11.886	.011	4.067	1	163	.045

a Predictors: (Constant), blaminhisp
b Predictors: (Constant), blaminhisp, Academic Support
c Predictors: (Constant), blaminhisp, Academic Support, Institutional Support
d Predictors: (Constant), blaminhisp, Academic Support, Institutional Support, Student Services
e Dependent Variable: Graduation rate of full-time students - 1997 cohort

Discussion

The series of regression analyses using the original six categories of expenditures data allowed for the exclusion of three categories: public service, research, and instruction. The iterative process with various combinations of the variables showed all were correlated among themselves (i.e., high collinearity) necessitating excluding and/or combining some in order to get better estimates of the regression coefficients. These three categories did not provide sufficient statistical power by themselves for inclusion[4]. The precision of the estimates of explanatory power was maximized while variability of the estimates of predicted scores were simultaneously minimized by excluding these categories. Once the satisfactory subset of variables was settled upon, the ethnicity data were entered as a controlling factor. The final model, which included the ethnicity data, explained approximately 50% of the variation among the institutions' graduation rates, but the stability of the estimates of the regression coefficients is an issue because there is still collinearity among the expenditure variables. However, repeated analyses found the academic support data continuously provided the greatest impact on the graduation rates. Unfortunately, the IPEDS data contain no other student characteristics for the 1997 cohort that could have been included, such as preparedness, level of parental education, or programmatic information from the institutions that could possibly increase the explained variability over the 50%. With other available data, the expenditures could either be combined into one category or one or more components eliminated, to remove the remaining collinearity and better assess the factors impacting graduation rates.

Analysis of a sub-group

In reviewing the list of institutions it became apparent it was a heterogeneous group. There were doctoral degree-granting universities and liberal arts colleges included in the file. A subgroup from the file was selected consisting of only those institutions with Carnegie classification of 21—Master's degree granting. Seventy-six institutions provide sufficient data to perform the analysis. The mean graduation rate was M=38.6%, (stddev.=13.8) (table 7). An interesting finding is that less of the variability among the graduation rates is explained by the expenditure data in these Masters' institutions, and the institutional support variable did not obtain statistical significance and was omitted from the model by the stepwise regression algorithm, but the impact of the academic support and student services expenditures was greater at these institutions. In the larger group the graduation rate increased by .03% for every $1million spent in academic and institutional support and .06% for every $1 million spent on student services. In the sub-group, the graduation rate increased by .13% for every $1 million spent on academic support and .16% for every $1 million spent on student services (academic support and student services data positively and significantly affected the rates B=.13, t=2.64,p=.01; B=.16, t=2.29, p=.03, respectively (table 10). Ethnicity negatively impacted graduation rates: B=-.11, t=-2.37, p=.02 (table 10). About 37% of graduation rate variance was explained using the current, sub-group, dataset, where as in the previous, larger group, approximately 50% was explained by the data (table 8). The sub-group model obtained statistical significance F (3,72)=13.88;p=.000 (table 9). The above suggests that $6.7 million of

[4] Principal components analysis was employed to construct unique categories based on the six variables. It resulted in one large component on which all of the variables loaded and three smaller ones. There are correlations among the factors and, rather than employing a correlational oblique factor rotation it was decided to eliminate variables that did not provide significant explanatory power or minimize residual variability.

the $51.6 million (13%) of the monies allocated to academic support over the six-year period contributed to the graduation rate of 38.6%, and similarly, $6.3 million of the $39.3 million (16%) appropriated to student services contributed to the rate. The most influential category in explaining the graduation rates is the academic support category uniquely explaining 23% of the variability, Rsq change=.23 (table 8).

Table 7.

Descriptive Statistics

	Mean	Std. Deviation	N
Graduation rate of full-time students - 1997 cohort	38.66	13.815	76
blaminhisp	29.2618	27.45706	76
Student Services	39.3100	23.57301	76
Academic Support	51.5710	34.44296	76
Institutional Support	64.7015	35.50211	76

Table 8
Model Summary(d)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	
Step 1	0.31	0.10	0.08	13.23	0.10	7.79	1.00	74.00	0.01	
Step 2	0.57	0.32	0.30	11.54	0.23	24.19	1.00	73.00	0.00	
Step 3	0.61	0.37	0.34	11.22	0.05	5.23	1.00	72.00	0.03	
a	Predictors: (Constant), blaminhisp									
b	Predictors: (Constant), blaminhisp, Academic Support									
c	Predictors: (Constant), blaminhisp, Academic Support, Student Services									
d	Dependent Variable: Graduation rate of full-time students - 1997 cohort									

Table 9

ANOVA(d)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1362.908	1	1362.908	7.787	.007(a)
	Residual	12951.046	74	175.014		
	Total	14313.954	75			
2	Regression	4585.963	2	2292.981	17.207	.000(b)
	Residual	9727.992	73	133.260		
	Total	14313.954	75			
3	Regression	5244.581	3	1748.194	13.879	.000(c)
	Residual	9069.373	72	125.964		
	Total	14313.954	75			

a Predictors: (Constant), blaminhisp
b Predictors: (Constant), blaminhisp, Academic Support
c Predictors: (Constant), blaminhisp, Academic Support, Student Services
d Dependent Variable: Graduation rate of full-time students - 1997 cohort
Variable: Graduation rate of .Full-time students - 1997 cohort

Table 10.

Coefficients(a)								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	43.21	2.23		19.41	0.00	38.77	47.64
	blaminhisp	-0.16	0.06	-0.31	-2.79	0.01	-0.27	-0.04
2	(Constant)	32.80	2.87		11.42	0.00	27.07	38.52
	blaminhisp	-0.14	0.05	-0.27	-2.79	0.01	-0.23	-0.04
	Academic Support	0.19	0.04	0.48	4.92	0.00	0.11	0.27
3	(Constant)	29.22	3.20		9.12	0.00	22.83	35.60
	blaminhisp	-0.11	0.05	-0.23	-2.37	0.02	-0.21	-0.02
	Academic Support	0.13	0.05	0.31	2.64	0.01	0.03	0.22
	Student Services	0.16	0.07	0.28	2.29	0.03	0.02	0.30
a	Dependent Variable: Graduation rate of full-time students - 1997 cohort							

The following list of institutions are those Master's granting institutions whose graduation rate for the 1997 cohort exceeded the mean of 39%:

California State University-Bakersfield
California State University-Chico
California State University-San Bernardino
California State University-Stanislaus
Citadel Military College Of South Carolina
College Of Charleston
CUNY Queens College
Fitchburg State College
Florida Agricultural And Mechanical University
Kean University
Minnesota State University-Moorhead
Montclair State University
North Carolina A &T State University
North Carolina Central University
Rhode Island College
Rowan University
Rutgers University-Camden
Saint Cloud State University
Saint Peters College
Southwest Missouri State University
Texas State University-San Marcos
College Of New Jersey
University Of Tennessee-Chattanooga
University Of Michigan-Dearborn
University Of Minnesota-Duluth
University Of North Carolina-Wilmington
University Of Northern Iowa
University Of Wisconsin-Eau Claire
University Of Wisconsin-La Crosse
University Of Wisconsin-Oshkosh
Western Washington University
Westfield State College
William Paterson University of New Jersey
Winthrop University
Worcester State College

Discussion

The smaller sample demonstrates financial and enrollment profiles impact the sub-group of Master's-granting institutions differently than they impacted the larger group of all public institutions located in medium sized cities. One finding repeatedly surfaced in both the larger "population" and the sub-group sample—the monies spent supporting the academic programs provided the greatest impact on the graduation rates. Monies spent supporting student services were also found to positively impact graduation rates, but to a lesser extent, and the ethnic breakdown of the institutions' students also significantly impacted the rates, but negatively. Another difference between the two samples is that the institutional support expenditures did not significantly impact the graduation rates at the Master's-granting institutions, as they did the larger sample.

Percentages of expenditures by category

Percentages of expenditures by category were examined over the six-year period by all of the institutions; the Carnegie 21 (Master's-granting) institutions; and, the Carnegie institutions whose graduation rates were above the median of 38%. They show that within the sample of all institutions a greater percentage of the expenditures went to research than at the Carnegie 21 institutions, and less went to academic and institutional support. At the Carnegie 21 institutions, more money was spent in the areas of instruction and student services than in the larger sample.

The masters' institutions also spent less in the areas of public service, and slightly more in the area of academic support.

Comparing the two groups of Masters' institutions, it is seen that the group that graduated the higher numbers of students spent more on instruction, academic support, institutional support and less on public service, research and student services.

Conclusion

Data gathered from the IPEDS Peer Analysis tool allowed for an investigation of how expenditures in the financial categories captured by that annual survey impact graduation rates—a measure selected by Federal and State legislatures to gauge institutional effectiveness. It was found that there was a high degree of correlation among the expenditure variables and, by means of successive analytic procedures, several could be removed. Of the categories that remained academic support and student service expenditures repeatedly emerged as providing positive and significant effects on the graduation rates, and with the greatest explanatory power. Included in the definition of academic support are references to educational materials, activities and support services for academic functions, media, administration, separately budgeted academic personnel development, and course and curriculum development. Under student services are expenses for admissions, registrar, "...and activities whose primary purpose is to contribute to students' emotional and physical well-being and to their intellectual, cultural, and social development outside the context of the formal instructional program." What is more, in regard to the Master's-granting institutions, the degree of impact from academic support and student service was greater than that provided to the larger population. Although the results provide a high degree of explanatory information there is still much missing of what impacts graduation rates, especially in regard to the Carnegie 21 institutions, where almost 70% of the variance is not explained by the model. The institutions in the analysis conformed to a profile of "urbanicity", minority enrollment, and public control. Analysis of private institutions with different environmental conditions and student ethnic profile may obtain different results.

The comparison of expenditures by institution type in figures 1 to 3 shows that, within all the separate analyses, the area of instruction receives the "greatest piece of the pie." The second largest piece is research when all institutions in the data set are assessed, but when just masters' institutions are observed institutional support receives the second largest number of dollars. Analysis of a qualitative nature may shed light on programs existent in all master's-granting institutions, master's-granting institutions with exemplary graduation rates, and/or institutions in large urban settings. Graduation rates are not only impacted by the categories in which institutions spend; student characteristics are more complex than the ethnic/racial components addressed here. Motivation and involvement in extra curricular activities and academics also impact student success.

NSSE'S BENCHMARKS – ONE SIZE FITS ALL?

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Administrators of the National Survey of Student Engagement (NSSE) argue that the results from the five benchmarks, constructed of about forty out of the survey's eighty items, "produce a set of national benchmarks of good educational practice that participating schools are using to estimate the efficacy of their improvement efforts" (Kuh, 2001b). The objective of this paper is to show that any assessment of educational quality cannot be separated from students' expectations and goals. To the degree that traditional and nontraditional students differ on these dimensions, benchmarking must carefully avoid bias toward one "type" of student over the other. Traditional college students (those starting as freshmen and attending college immediately after high school) expect a broad range of non-academic options as part of their educational experience, such as extracurricular activities, community involvement, and interaction with faculty and peers outside the classroom. Nontraditional students' educational goals are more narrowly focused. We argue that three of the five NSSE benchmarks mix items that primarily reflect the expectations of traditional college students with more "universal" educational experiences that focus on academics, classroom activities and institutional support, and therefore are not appropriate for assessing the quality of education for *all* college students. The paper also argues for the restructuring of these problematic benchmarks to accurately reflect educational practices common to all types of students instead of using the current benchmarks, which penalize institutions with large nontraditional student populations.

Brief Literature Review

Developed in part as an alternative to reputation- and resource-based ranking, the NSSE was designed to assess the extent to which students are engaged in educationally purposeful activities that contribute to their learning and success during college (Kuh, 2001a, 2001b; Pike, 2003). Based on accumulated research, starting with the "Seven Principles for Good Practice in Undergraduate Education" (Chickering & Gamson, 1987), NSSE administrators argue that there is a correlation between students' engagement and the quality of education they receive. "As a survey NSSE annually assesses the extent to which students at hundreds of four-year colleges and universities are participating in educational practices that are strongly associated with high levels of learning and personal development" (Kuh, 2001a). In addition to including activities that are traditionally associated with learning, such as reading and writing, preparing for class, and interacting with instructors, "the engagement concept also encompasses some other key activities that more recently have come to the fore as being important, such as collaborating with peers on projects, problem solving tasks, and community service" (Kuh, Gonyea, & Palmer, 2001).

Using a questionnaire that consists of over eighty items, NSSE assesses student engagement in activities its researchers contend contribute to learning and success during college. In order to make the survey results more accessible and manageable, five benchmarks were created: "To facilitate the conversation about student engagement, learning, and

institutional improvement, we grouped key questions from the survey into five clusters or benchmarks of effective educational practices" (Kuh, 2003). The five NSSE benchmarks are: 1) level of academic challenge, 2) active and collaborative learning, 3) student-faculty interaction, 4) enriching educational experiences, and 5) supportive campus environment. Overall, the benchmarks "are intended to help steer the national conversation about collegiate quality away from resources and reputational rankings toward what matters more to student learning—good educational practice" (NSSE 2000, p.1). Survey administrators claim that NSSE's results, including the benchmarks, can be used to compare the quality of education at different institutions: "Those institutions that more fully engage their students in the variety of activities that contribute to valued outcomes of college can claim to be of higher quality in comparison with similar types of colleges and universities" (Kuh, 2001b). "The NSSE benchmarks are a window into student and institutional performance at the national, sector, and institutional levels" (Kuh, 2003).

Several analyses (conducted by NSSE researchers among others) show, however, that nontraditional students (older, commuters, transfers) respond differently on many of the NSSE questions – especially those items inquiring about activities outside the classroom – and consequently have lower scores on several of the NSSE benchmarks. For example, students enrolled full-time have consistently higher scores on NSSE benchmarks, probably because full-time students have more opportunities to become engaged in educationally purposeful activities (Pike, 2003). Similar results are shown for students who entered the institution as transfers. "Overall, transfer students are less engaged in effective educational activities than their non-transfer peers. Transfer students tend to be older and have more external responsibilities such as working for pay off-campus and caring for dependents. Transfer students believe their coursework provides more emphasis on cultivating higher-order thinking abilities than their peers, yet they interact with faculty members and engage in enriching educational programs at levels lower than their counterparts" (NSSE 2004 overview, p.9). Commuter students were also found to be less "engaged" overall, although this was not true in the classroom (Kuh, Gonyea & Palmer, 2001; Chickering, 1974; Pascarella & Terenzini, 1991). Finally, older students were found to be less engaged in activities outside the classroom: "Younger traditional age students (18-24 years) report spending slightly more time in educationally productive activities and perceive their campus environment as more supportive than older students. However, older students did not differ much from their younger counterparts in educational and personal growth and in their perceptions of course emphasis on higher-order mental activities" (NSSE 2004 overview, p.9). Other research has found that older seniors (those over age 25) had similar responses to younger seniors on most NSSE items an institution can "control" – classroom activities, relationships with faculty and administrators, and institutional support – but had different responses on items that were related to student lifestyle. These older seniors mainly showed less engagement in activities and less interaction with other students and faculty outside the classroom (Hicks & Lerer, 2002).

The educational goals of nontraditional students cannot and should not be ignored by NSSE researchers as though this group is inconsequential. Quite the contrary: the proportion of *traditional* students is steadily declining on college campuses. "According to NCES, just over 40 percent of postsecondary students today attend part time, compared with less than one-third a generation ago. Similarly, the proportion of students 25 and older has jumped from just over

one-quarter in 1970 to nearly 40 percent today. Moreover, nearly 40 percent of students now attend more than one institution in their college career. All in all, we live in nontraditional times when obtaining a 'four year' degree in four years is the exception rather than the rule" (*The Chronicle of Higher Educatio*n, June 27, 2005). Nontraditional students, who are usually older, live and work off-campus and have families and responsibilities not related to their experiences as students, do not seek the same outcomes from their education as traditional college students. They tend to focus on academics, and do not have the time (or perhaps the inclination) to participate in off-campus activities or interactions outside the classroom.

Accordingly, NSSE *should not* ignore the preferences and experiences of this distinct group of students by expecting the same behaviors and practices from *all* college students. Educational practices that are applicable to all students, such as classroom-related activities and institutional support, should be distinguished from activities that clearly reflect preferences and behaviors of traditional college students, such as study abroad, participation in extracurricular activities, and interactions with faculty and students outside the classroom. Even Chickering & Gamson, whose seven principles of good educational practice serve as the basis for NSSE's conceptual framework, argued against a one-size-fits-all scheme: "The ways different institutions implement good practice depend very much on their students and their circumstances" (1991).

Combining the educational needs and preferences of traditional and nontraditional students under a few all-encompassing (and arguably biased) benchmarks puts institutions with large nontraditional student populations at a comparative disadvantage. While NSSE researchers clearly imply by the way the benchmarks are constructed that out-of-classroom activities are an essential part of students' educational experiences, they have not proven (or even argued) that nontraditional students, who tend to engage in these activities less than traditional students, receive an inferior education. In fact, NSSE's own researchers show that nontraditional students are more satisfied with their overall educational experiences (NSSE 2004 overview).

Brief Summary of the Methodology

To test the argument of the paper, we created distinct traditional and nontraditional groups using students' age and whether they had started at Adelphi as freshmen or transfers. We also chose to focus on seniors, a group that includes a larger proportion of nontraditional students. Traditional students were defined as seniors younger than 25 who had started at Adelphi as freshmen. Nontraditional students were defined as seniors older than 30 (since the average age of Adelphi senior respondents was 30.5) who started as transfers. Seniors who did not fit this "pure" traditional/nontraditional typology were excluded from the analysis. Other independent variables included in the regression equations were on-campus residence, gender, ethnicity and parents' education.

We expected that there would be no significant difference between the two groups in analyzing the two benchmarks that include items applicable to all students: 1) The "level of academic challenge" benchmark, which focuses on classroom and academic activities; and 2) the "supportive campus environment" benchmark, which is applicable to the successful educational endeavors of all students. In contrast, we hypothesized that a large number of items in the

remaining benchmarks are primarily applicable to traditional students. 1) In the "student-faculty interaction" benchmark, a smaller proportion of older students are likely to engage in three of the five activities specified: fewer will need to "talk about career plans with faculty members," or will have time for interacting with faculty members outside class to "discuss ideas from readings or classes," or "work on activities other than coursework (committees, orientation, student-life activities, etc.)." They also will probably spend less time on the fourth item, "discussed grades or assignments with an instructor," since this activity tends not to occur in the classroom, although they might speak with instructors immediately after class or e-mail them. 2) In the "active and collaborative learning" benchmark, three of seven items refer to activities outside the classroom: "worked with classmates outside class to prepare class assignments," "tutored or taught other students," and "participated in community-based project as part of a regular course." 3) In the "enriching educational experiences" benchmark, four of twelve variables inquire about out-of-classroom, non-academic activities: participating in "co-curricular activities," "practicum, internship, field experience, co-op experience or clinical assignment," "community service or volunteer work," and "study abroad." A fifth item – "learning communities" – is problematic in that it is usually a part of students' first-year experience and not of students who started as transfers (although transfer students might think that taking classes with the same students in their majors is "other formal program where groups of students take two or more classes together"). This benchmark is also conceptually questionable since it includes seemingly unrelated items covering at least four areas: participation in activities outside the classroom, participation in activities inside the classroom, campus diversity, and technology use.

Brief Summary of the Data Sources

Data are drawn from two sources: NSSE's data and Adelphi's data. Adelphi has participated in NSSE each year since its introduction in spring 2000. Adelphi has five years of NSSE results (since NSSE created its benchmarks in 2001) at its disposal. The final file included 432 seniors: 192 traditional and 240 nontraditional (Table 1).

Table 1: Respondents' distribution within the groups

	Age		
	Less than 25	**25 – 30**	**Over 30**
Freshmen	192[i]	10	32
Transfers	165	81	240[ii]

[i] = Traditional group

[ii] = Nontraditional group

Note: On-campus residence was not used to create the traditional/nontraditional groups because the vast majority of all seniors live off-campus. The off-campus (commuter) specifics are: traditional group, 144 commuters; nontraditional group, 240 commuters.

While NSSE created aggregate benchmarks to derive scores for an entire institution, we applied the same process to create benchmark scores for individual students – using the SPSS syntax NSSE provides on its website. These constructed benchmarks were the dependent variables in the analyses. Variables used as controls were those found in the literature to affect students' educational experiences: entrance status, on-campus residents versus commuters, gender, ethnicity, and parents' education.

Results

When the demographic characteristics of the traditional and nontraditional groups are examined, the results show a similar proportion of women. The nontraditional group includes a slightly higher proportion of minority students (non-white) and a considerably higher proportion of respondents whose parents did not graduate from college (Table 2).

Table 2: Demographic characteristics

	Traditional	Nontraditional
% Women	77.1%	80.4%
% Minority	15.1%	23.8%
% At least one parent graduated from college	60.1%	39.5%
% Commuters	75.0%	100.0%
Average age	21.8	42.0

As hypothesized, when the mean responses of the two groups to the benchmarks are examined, the results show similar responses to the "level of academic challenge" and "supportive campus environment" benchmarks, slightly larger differences to the "active and collaborative learning benchmark," and markedly larger differences to the "student-faculty interaction" and "enriching educational experiences" benchmarks (Table 3).

Table 3: Average scores of the benchmarks

	Traditional	Nontraditional
Level of academic challenge	54.2	53.4
Active and collaborative learning	49.3	44.6
Student-faculty interaction	50.3	39.3
Enriching educational experiences (2004, 2005 data only)	41.8	30.2
Supportive campus environment	56.9	59.1

As a first step, we conducted OLS regression analyses using the five NSSE benchmarks as dependent variables and the traditional/nontraditional groups (nontraditional=1, traditional=0), gender (men=1, women=0), minority (non-white=1, white=0) and parents' college education (college graduates=1, none=0) as independent variables (Table 4).

As hypothesized, the traditional/nontraditional variable was not a significant predictor for the "level of academic challenge" benchmark (p=.60) or the "supportive campus environment" benchmark (p=.22). Additionally, with the exception of gender in the equation where the "supportive campus environment" benchmark is the dependent variable, none of the other independent variables were significantly related to these two benchmarks. It should be noted, however, that virtually no variance in the "level of academic challenge" benchmark is explained by the demographic variables included (R^2=.004). Also, while the traditional/nontraditional variable explains 6 percent of the variance in the "supportive campus environment" benchmark, neither this variable nor any of the other independent variables is significantly related to this benchmark.

As expected, the traditional/nontraditional variable was significant in the other benchmarks. Seniors in the nontraditional group had significantly lower scores on the "active and collaborative learning" benchmark (p=.004) and the "student-faculty interaction" benchmark (p<.001). When the other independent variables are included, the traditional/nontraditional variable was still highly significant and, with the exception of gender in the equation where the "student-faculty interaction" benchmark is the dependent variable, none of the other independent variables is significant. The proportion of variance explained by the traditional/nontraditional variable for these two benchmarks is, however, very small (less than 2%).

Table 4: OLS Regressions of NSSE's Benchmarks (B & significance)

	Level of academic challenge	Active and collaborative learning	Student-faculty interaction[i]	Enriching educational experiences[ii]	Supportive campus environment
With Traditional/Nontraditional variable only					
Constant	54.209 (.000)	49.071 (.000)	50.390 (.000)	41.693 (.000)	56.803 (.000)
Traditional/Nontraditional	-.463 (.604)	-4.514 (.004)	-10.917 (.000)	-11.974 (.000)	2.244 (.221)
Adjusted R^2	-.002	.017	.001	.104	.060
With all other independent variables					
Constant	52.765 (.000)	49.780 (.000)	48.915 (.000)	41.668 (.000)	54.707 (.000)
Traditional/Nontraditional	-.477 (.754)	-4.796 (.003)	-10.131 (.000)	-11.156 (.000)	2.297 (.223)
Gender	1.217 (.501)	-.576 (.763)	5.717 (.024)	5.429 (.111)	5.019 (.025)
Minority	.802 (.655)	.332 (.862)	-2.830 (.260)	-5.869 (.129)	2.314 (.298)
Parents' college	1.751 (.246)	-1.040 (.515)	-.955 (.650)	-.984 (.734)	1.015 (.587)
Number of respondents	418	420	420	132	417
Adjusted R^2	-.004	.012	.010	.132	.061

[i] Excludes "working on research project with faculty member outside the classroom"
[ii] Includes only the 2004 and 2005 respondents

The benchmark most strongly related to the traditional/nontraditional variable is "enriching educational experiences" – nontraditional seniors have significantly lower scores on this benchmark than traditional seniors ($p<.001$). Moreover, belonging to one of these two groups by itself explained 10 percent of the variance of this benchmark, with an adjusted $R^2=.098$ (compared with an adjusted R^2 of .01 to .03 in the other benchmarks). These results reinforced our earlier argument that in addition to being inconsistent conceptually, this benchmark also includes a large number of items that depict outside-of-classroom activities, which are not applicable to nontraditional students.

We further analyze the benchmarks in which the differences between traditional and nontraditional seniors are significant, by indicating our opinion of the applicability of each of the items in the benchmarks to *all* students and showing the correlations between the items and the two groups. We hypothesize that the groups will not be significantly different for the items we consider as universally applicable to "good educational practices," but significantly different for items that we consider as applicable solely for traditional college students (Table 5).

Almost all items that we argued are only applicable to traditional students (less than 25 years old who started as freshmen) compared with nontraditional students (over 30 years old who started as transfers) were significantly correlated with the traditional/nontraditional indicator. About half of the items we argued are applicable to all students, however, were significant as well. In the "active and collaborative learning" benchmark, nontraditional students asked significantly more questions and participated in class discussions ($p=.008$), but made fewer class presentations ($p=.005$) – two items we hypothesized are equally applicable to both groups. While older students probably feel less intimidated by professors and fellow students and are therefore more inclined to express their opinion, it is not clear why they would make fewer class presentations.

Similar results are shown for the "student-faculty interaction" benchmark – the groups significantly differed on all the items we hypnotized they would, but were also significantly different on some of items we thought were equally applicable to both groups. Nontraditional students discussed grades or assignments significantly less than traditional students ($p=.01$) – an item we were not sure about. We would also like to add that the questionnaire item we consider the most important indicator for student-faculty interaction, quality of relationships with faculty members, should have been a part of this benchmark.

Finally, in the "enriching educational experiences" benchmark, the two groups significantly differed on almost all items we thought were not equally applicable to all students. The only exception was the "study abroad" item; there was no significant difference between the groups, probably because very few traditional Adelphi students participate in this experience. In addition, we were not sure whether nontraditional students have the same opportunity to interact with diverse groups of students as do traditional students, because they spend less time on campus outside the classroom; the traditional and nontraditional groups responded in significantly different ways to two items that focused on conversations with other students. We were also not sure whether respondents would understand what is meant by "learning communities," since many transfers might have thought that this concept applied to taking classes in their majors with the same students (although this is not the item's intent) – and the

groups were indeed not significantly different in their response. In addition, the two groups were significantly different on taking foreign language courses – an item we were not sure about – probably because Adelphi does not require that all students take foreign languages, and students who started as transfers might have been either less inclined to do so or had taken these courses at their prior institutions.

Table 5: Applicability of items in the three NSSE benchmarks and their correlation with the traditional/nontraditional indicator

Benchmarks	Applicability to *all* students	Correlation
Active and collaborative learning		
Asked questions in class or contributed to class discussions	yes	.127**
Made a class presentation	yes	-.135**
Worked with other students on projects during class	yes	-.015
Worked with classmates outside of class to prepare class assignments	no	-.104*
Tutored or taught other students	no	-.291***
Participated in a community-based project as part of a regular course	no	-.122*
Discussed ideas from your reading or classes with others outside of class	yes	-.015
Student-faculty interaction		
Discussed grades or assignments with an instructor	not sure	-.157***
Talked about career plans with a faculty member or advisor	no	-.108*
Discussed ideas from reading/classes with faculty members outside of class	no	-.267***
Worked with faculty members on activities other than coursework	no	-.294***
Received prompt feedback from faculty on your academic performance	yes	-.062
Enriching educational experiences		
Serious conversations with students with different religious beliefs, political opinions, or values	not sure	-.256***
Serious conversations with students of a different race or ethnicity	not sure	-.222**
An institutional climate that encourages contact among students from different demographic backgrounds	yes	-.077
Using electronic technology to discuss, complete an assignment	yes	-.024
Participating in internships, field, co-op experiences[i]	no	-.238**
Participating in community service or volunteer work[i]	no	-.219***
Participating in foreign language coursework[i]	not sure	-.266***
Participating in study abroad[i]	no	-.139
Participating in independent study or self-designed major[i]	yes	-.193*
Participating in culminating senior experience[i]	yes	-.047
Participating in co-curricular activities	no	-.257***
Participated in learning community/some other formal program[i]	not sure	.010

Significance level: * <.05; ** <.01; ***<.001

[i] 1=done; 0=plan to do, do not plan to do, have not decided

Conclusions and Implications for Future Research

While NSSE items are important indicators of experiences that certain types of students might be seeking and expect from their college, the benchmarks are supposed to provide an overall picture of colleges' educational practices. The fact that students' needs and expectations differ is to be expected – traditional students usually prefer educational experiences that provide activities outside the classroom in addition to their classroom education, while nontraditional students are more focused on an education that provides the academic experiences and support services they need, apart from extracurricular offerings and activities outside the classroom. The current NSSE benchmarks are biased, however, toward traditional college students. They mix items that clearly reflect the particular experiences of traditional students with experiences reflecting the quality of education that *all* students need and deserve.

The results of the regression analyses support our argument. By including items in the benchmarks that are skewed toward the goals and expectations of traditional students, NSSE penalizes institutions with a high concentration of nontraditional students (especially older students who started as transfers). The quality of education in institutions with a large proportion of nontraditional students will inevitably look worse when compared on the benchmarks with institutions serving more traditional students.

More specifically, we believe that a benchmark claiming to capture "student-faculty interaction" cannot focus on activities outside the classroom. Such a benchmark must also include the only item that directly asks students about their interaction with faculty – students' rating of the quality of their relationships with faculty members (this item is included in the "supportive campus environment" benchmark instead).

The "enriching educational experiences" benchmark is also problematic; in addition to the fact that this benchmark includes a large number of items that we believe are only applicable to traditional students, we find the benchmark itself to be conceptually muddled. While an enriching educational environment is very important to all students, NSSE might want to consider developing two benchmarks. One should cover areas applicable to all students while the other should cover activities that are almost exclusively applicable to traditional students, such as study abroad, extracurricular activities, and social or community activities outside the classroom.

In conclusion, we strongly recommend that NSSE either restructure their benchmarks so they are more applicable to all students or at least consider excluding items from its benchmarks that are biased against nontraditional students. As an alternative, some benchmarks should apply to all types of students while others might be geared towards distinct subcategories. This type of specialization would reflect the growing diversity of postsecondary student populations and institutional efforts to serve those populations. The Carnegie Foundation's current engagement in a fundamental reconsideration of the Carnegie Classification provides a model here. "We plan to develop a more flexible system that will permit institutions to be grouped in several ways, in recognition of the fact that a single classification scheme can conceal the many ways that institutions resemble or differ from one another," said Carnegie Senior Scholar Alexander McCormick (http://www.carnegiefoundation.org). As the Foundation recognizes, one size does not fit all. We ask that NSSE administrators consider the same line of reasoning.

References Cited

Chickering, A. W. and Gamson, Z. F. (1987). "Seven Principles for Good Practice in Undergraduate Education." *AAHE Bulletin* 39 (7): 3-7.

Chickering, A., & Gamson Z. F. (1991). "*Applying the Seven Principles for Good Practice in Undergraduate Education.*" New Directions for Teaching and Learning, No. 47. San Francisco: Jossey-Bass.

Hicks, R. & Lerer N. (2002). "NSSE: Applicable to All?" Paper presented at the Northeast Association for Institutional Research 29th Annual Conference.

Kuh, G. D. (2001a). "Assessing What Really Matters To Student Learning: Inside the National Survey of Student Engagement." *Change* 33 (3): 10-17, 66.

Kuh, G. D. (2001b). "The National Survey of Student Engagement: Conceptual Framework and Overview of Psychometric Properties." Bloomington, IN: Indiana University Center for Postsecondary Research and Planning.

Kuh, G. D. (2003). What we're learning about student engagement from NSSE. *Change*, 35(2), 24-32.

Kuh, G. D., Gonyea, R. M., & Palmer, M. (2001). "The Disengaged Commuter Student: Fact or Fiction?" Commuter Perspectives 27 (1): 2-5.

National Survey of Student Engagement. (2000, 2004). *NSSE 2000 and 2004 Overviews*.

Pascarella, E. T. (2001). "Identifying excellence in undergraduate education: Are we even close?" *Change, 33(3),* 19-23.

Pascarella, E. T., & Terenzini, P. T. (1991). *How college affects students: Findings and insights from twenty years of research.* San Francisco: Jossey-Bass.

Pike, G. (2003, May). "Measuring quality: A comparison of U.S. News Rankings and NSSE benchmarks." Paper presented at the meeting of the Association for Institutional Research, Tampa, FL.

*The Chronicle of Higher Educatio*n daily news archive, 6/27/05, http://chronicle.com/daily/2005/06/2005062708n.htm.

GAUGING THE IMPACT OF STUDENT CHARACTERISTICS ON FACULTY COURSE EVALUATIONS

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Introduction

Course evaluations may contain questions for the students to describe their own gender, expected grade, level of study, or other information. If the survey instrument does not include student characteristics, administrators may gather selected student information at the section level from enrollment records. Faculty evaluations measure student satisfaction with the instructors' teaching skills, but these reports may take on a different meaning when presented in conjunction with student demographics or class size. The survey manager needs to balance the omission of critical data on student characteristics with information overload in tasks such as formatting reports, carrying out special analysis, or making recommendations for survey instrument redesign. Gathering student characters on faculty evaluations present both problems and opportunities.

Problems Gathering Student Characteristics on Course Evaluations:

- Students may view questions about them as intrusive or irrelevant in this context
- We gather far more data than we can analyze. Gathering student characteristics on course evaluations wastes both good will and class time if these data are not used.

Opportunities for Student Characteristics on Course Evaluations:

- It is easier to establish a clear link between student characteristics and faculty evaluation outcomes if the characteristics are measured on the survey, rather than estimated from registration records after the fact.

Grade Inflation and Faculty Evaluations

"Evaluations depend solely on students, and grade inflation reflects faculty worried about the impact students may have on their careers." (Virginia Myers Kelly, 2005)

Testing the conventional wisdom that students at your campus expect good grades in return for good faculty evaluations will be easier if your survey instrument includes a question about expected grades. I simulated data following the output for faculty evaluations for undergraduate instruction at the University at Albany-SUNY. The survey instrument for this simulation asks the student to provide their expected course grade in the categories:

E/U (Failing) = 1, D = 2, C = 3, B = 4, A = 5, S = 6

There is also a question asking the students to rank their instructor, overall using the Likert scale with the following values:

1 = Poor 2 = Fail 3 = Average 4 = Good 5 = Excellent

Table 1 shows simulated data for undergraduate students who do not expect to fail their course with responses for "Instructor, Overall" and "Expected Course Grade." We wish to test the null hypothesis that responses to "Instructor, Overall" are independent from responses to "Expected Course Grade." If variables in the rows and columns are independent, the expected cell frequency for any cell in the table will equal the row total multiplied by the column total divided by the grand total. For example, the expected cell count for students expecting a grade of "D" who rated their instructors as "Poor" would be (291 * 796)/24176 = 9.58.

Table 1. Simulated Responses for "Instructor, Overall" and "Expected Course Grade."

		Instructor, Overall					Column Totals
		1 Poor	2 Fair	3 Average	4 Good	5 Excellent	
Expected Grade	D	32	33	59	88	79	291
	C	196	343	603	998	849	2989
	B	371	622	1436	3872	4765	11066
	A	197	305	781	2773	5774	9830
Row Totals		796	1303	2879	7731	11467	24176

The Table 1 data set should meet three main assumptions of the Chi-square (X^2) test of independence following the guidelines set by Cochrain (1954).

- The individual surveys represent independent trials. We assume the students did not collaborate on their answers when filling out the course evaluations.
- The expected count in each category should be at least 1.
- No more than 1/5 of the categories should have expected counts of less than 5.

Advantages of a Non-parametric Model in this Simulation

Many statistical models involve the estimation of population parameters such as the mean or variance from a random sample. These models usually assume the probability distribution of the dependent variable, or variable of interest, looks like a smooth, bell-shaped curve. In statistical jargon, the dependent variable must have a continuous, normal distribution. The variable "Instructor, Overall" has a distribution that is both discontinuous and non-normal. Employing a non-parametric model is advantageous since no assumptions need to be made concerning the underlying data distribution.

Table 2: SPSS Output for a row by column test of independence for "Instructor, Overall" and "Expected Course Grade."

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1488.890(a)	12	.000
N of Valid Cases	24176		

a 0 cells (.0%) have expected counts of less than 5. The minimum expected count is 9.58.

Faculty ratings are not independent of expected course grade in this example (Table 2). Sometimes a test may show a statistically significant association between two variables that is irrelevant in the real world. In this example, instructors have good reason to expect lower student satisfaction if they assign lower grades.

From Table 1, there is clear progression in students rating instructors as "Poor:"

Students Expecting a grade of D: 32/291 = 11%

Students Expecting a grade of A: 197/9830 = 2%

There is also an important pattern for students rating instructors as "Excellent:"

Students Expecting a grade of B: 4765/11066 = 43%

Students Expecting a grade of A: 5774/9830 = 59%

Policy Recommendations

If course evaluations at your campus are similar to this simulation, several policy considerations may follow:

- Faculty evaluations should be considered in conjunction with grade distributions.
- If your institution wants to follow Harvard and fight grade inflation by setting a cap on "A" grades in undergraduate courses, expect lower student satisfaction ratings.
- Expected course grade is relevant to understanding student satisfaction with instructors. This question should not be dropped during a survey redesign.

References

Cochrain, W.G. (1954). Some methods for strengthening the common X^2 test. *Biometrics.*10, pp. 417-451.

Virginia, M. K. (2005). Seeking Stable Ground. *AFT On Campus*. 25, pp.10-16.

CALCULATING RETENTION FOR ADULTS: MOVING BEYOND THE TRADITIONAL MODEL

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Abstract

The widely used formulas for calculating college student retention are based on an 18-22 year old population moving through the academy in a fall-to-fall pattern. This notion of retention is based on a first-time, full-time cohort. When these constraints are applied to nontraditional academic institutions, the results are generally misleading, largely because the enrollment patterns of nontraditional students do not follow a fall-to-fall pattern. Examining data from a college "dedicated to enabling adult students, regardless of geography or life circumstances, to manage and master a rigorous academic program and earn a degree," this paper will introduce an alternative method for calculating retention.[1]

Relying on a first-time, full-time cohort when calculating institutional retention rates does not adequately represent retention for institutions serving nontraditional students. These are institutions whose student body consists largely of adult students engaged in part-time study. This paper analyzes the application of conventional approaches in unconventional settings and proposes an alternative method that has been developed for use at Empire State College.

Introduction

Historically, the convention for calculating retention among higher education institutions has been to identify and track the enrollment and attrition status of the first-time, full-time cohort of students in any given fall. This methodology is based on the traditional progression of educational attainment. The notion is that students engage in post-secondary study on a full-time basis, beginning in the fall semester immediately following high-school graduation.

"Strongly held social norms emphasize that formal education is for the young – the first component in a 'tri-partition' of the life cycle into three orthogonal and linear segments: education, followed by work, followed by the leisure of old age" (Hagedorn, 2005b, p. 22). Research suggests an increasing number of students do not fit the profile of the traditional norm and are more likely to embark on alternative paths to (and through) postsecondary education (Choy, 2002; Han & Nesler, 2002; Horn and Carroll, 1996; Nesler & Gunnarsson, 2000).

A special analysis published by the National Center for Education Statistics (NCES) reported that nearly 75% of all undergraduates are considered nontraditional to some extent (Choy, 2002).[2] The term *nontraditional* as defined by Horn & Carroll (1996), suggests the

[1] Source: Empire State College Undergraduate Catalog 2005-06.
[2] This is a special analysis included in the Condition of Education 2002 and represents the most current analysis concerning nontraditional students available from NCES to date.

presence of one or more of the following seven characteristics: delayed enrollment in post secondary education, part-time attendance, financial independence, full-time employment and simultaneous enrollment, having dependents other than a spouse, single parent status, or the absence of a standard high school diploma.

Nontraditional students tend to engage in enrollment patterns and behaviors that defy conventional standards as well. They are more likely to stop-out, and are twice as likely to leave within the first year when compared to traditional-aged counterparts. It is no surprise then, that nontraditional students are nearly 25% *less* likely to obtain a degree within 5 years of enrollment (Horn & Carroll, 1996).

Over the last two decades, the percentage of nontraditional students served at 4-year public institutions has increased from 31% in 1986 to 57.5% in 1999 (Horn & Carroll, 1996; Choy, 2002). Moreover, there has been an increase in the number of institutions that offer distance and other flexible learning options intended to serve the needs of nontraditional students, and this pattern is likely to continue (Hussar, 2005).

While institutions have made strides to accommodate the arrival of nontraditional students, measures to assess retention and persistence have been slow to evolve. The notion of a "full-time, first-time, fall cohort" systematically excludes all part-time and transfer students, many of whom are nontraditional students. As Hagedorn (2005a) notes, "the current definitions and formulas do not include all students and so may provide inaccurate measure of retention" (Hagedorn, 2005a, p. 100).

Empire State College (ESC) is a recognized leader in distance education and is marketed as "the SUNY solution for working adults." Founded in 1971, the college has 46,000 alumni and serves about 16,000 students annually at more than 30 locations throughout New York State. Over the last 5 years the number of degrees awarded annually has grown by more than 25% and in 2004-05, the college awarded over 2,600 undergraduate degrees. More than 90% of the college's new undergraduate students enter as transfers, and two thirds of all enrolled undergraduates engage in part-time study. First-time, full-time enrollments represent less than 5% of new enrollments in any given term.

Retention rates (for ESC) identified by various sources range from 14% to 55%. The disparity among these statistics justifiably raised concerns, and often required explanation for those not familiar with the college or the characteristics of its students. Additionally, in the absence of consistent baseline data and appropriate methodologies, it has not been possible to empirically identify and broadly test factors related to retention at the college. This paper presents results from a comprehensive review of conventional and 'home grown' retention methodologies.

Literature Review

Student retention remains a major area of concern among higher education administrators throughout the country. Retention is often used as an indicator of institutional health and success

as well as a bellwether for student satisfaction. There are a number of theoretical models that pre-date the emergence of distance education and nontraditional students (e.g. Astin, 1977; Bean, 1980, 1983; Tinto, 1975, 1982, 1988, 1993). The premise of these models is that there are a number of factors that may influence the extent to which students are retained in higher education or at any higher education institution.

Perhaps one of the most influential theories has been Tinto's student integration model (1975). Tinto's model was based on a sociological approach and suggests that a combination of predetermined student attributes inform one's goals; and it is the integration of one's attributes and goals combined with academic and social experiences that influence the extent to which successful outcomes are realized or the student disengages. As Tinto explains, "it is the interplay between the individual's commitment to the goal of college completion and his commitment to the institution that determines whether or not the individual decides to drop out" (1975, p. 96). In the late 1980's, Tinto augmented his previous work to conceptualize stop-out behaviors as a three-stage progression: separation, transition and incorporation that relate to a student's ability (or inability) to integrate into the college environment (Tinto, 1988).

A review of literature by Kennedy and Scheckley (1999) affirms Tinto's theory, noting that interactions between students and the college environment most consistently explain variance in persistence and attrition. Some factors may be inherent to the student, and others may be a function of institutional characteristics and its ability to meet the needs of different types of students.

Critics of Tinto's approach have suggested that the model fails to adequately address external environmental factors that can impact the extent to which a student persists in pursuit of higher educational goals. The notion that other factors (such as competing obligations to family members and financial constraints) could offset an individual's commitment to one's goals and the institution was not explored (Braxton & Hirshy, 2005; Cabrera, Castaneda, Nora and Hengstler, 1992; Han & Nesler, 2002; Nesler & Gunnarsson; 2000; Tinto, 1982; Swail, Redd & Perna, 2003).

More recently, Eaton and Bean (1995) and later Bean and Eaton (2000) modified Tinto's model using a psychological perspective. This work incorporates student attitudes (which are thought to influence intentions to persist) and coping abilities into Tinto's model, suggesting that these additional factors contribute to one's ability to adapt to the collegiate environment. "Adaptation, as measured by social and academic integration should be an attitudinal reflection of a student's intention to stay or leave the institution…ultimately linked to the student's actual persistence or departure" (Eaton and Bean, 1995, p. 620).

While widely recognized and referred to among those in the field of higher education research, most theoretical literature does little to situate itself in the landscape of adult learners or more generally to nontraditional students. Early theorists could not speak to the emergence nontraditional post-secondary students, the motivations and the barriers they face (Kim, Collins, Stowe, & Chandler, 1995; Nesler & Hanner, 1998; Nesler & Gunnarsson, 2000) or the movement of students among various institutions. Adelman (1999) notes that, "when 60% of

undergraduates attend more than one institution and 40% of this group do not complete degrees, institutional graduation rates are not very meaningful. It is not wise to blame a college with superficially low graduation rates for the behavior of students who swirl through the system" (1999, p. ix). Adelman's comments gain further meaning when juxtaposed with the emergence of institutions that are serving nontraditional populations.

Adult students represent a growing segment of students pursuing higher education. According to the NCES, the proportion of older students (age 25+) pursuing postsecondary education has grown from 28% in 1970 to 39% in 1999 (Choy, 2002). Nearly 75% of today's undergraduates are considered nontraditional to some extent, and are more likely to conceptualize themselves as employees first and students second (Wirt, Choy, Rooney, Provasnik, Sen & Tobin, 2004). Furthermore, with the growth of distance education in the United States, an unprecedented number of learning opportunities are now available to meet the needs of busy adults (Wirt, et al., 2004).

Nontraditional students choose postsecondary enrollment for personal enrichment, skills acquisition and degree attainment purposes; and are more likely to experience limitations as they pursue postsecondary study (Hagedorn, 2005b). For example, nontraditional students typically engage in part-time study while simultaneously maintain commitments to competing priorities that limit time. This contributes to schedule conflicts, fewer course options and limited access to resources generally available to full-time students. Recent studies have tried to identify the best predictors for persistence among adult students and have determined that external factors such as home and personal commitments are more often *not* significantly related to persistence (Gigliotti, R. & Huff, H., 1995; Hagedorn, 2005b; Kemp, 2002; Nesler & Gunnarsson, 2000).

Given the cultural and political attachment to retention and persistence as indices of institutional success, it is important for audiences to recognize that nontraditional students represent a growing segment of postsecondary enrollments and possess individual characteristics, life circumstances and behaviors that distinguish them from traditionally aged students. Institutions dedicated to the service of this population should not be held accountable to the same expectations for postsecondary engagement and persistence.

Method

The following paragraphs document two components of this study. The first involves a comprehensive analysis of existing retention methodologies applied against a nontraditional population of students, followed by a new approach to retention that has been developed at Empire State College.

The characteristics of conventional retention methodologies[3] were identified and juxtaposed with the population characteristics and enrollment behaviors of Empire State College students. The Integrated Post-Secondary Education Data System (IPEDS) bases retention and graduation rate calculations exclusively on first-time, full-time, baccalaureate degree seeking students. Cohorts are created based on fall enrollment activity, and are longitudinally tracked over time, typically for six years. Students are considered retained when they reappear in subsequent fall semesters.

The characteristics and behaviors of the Empire State College student population are atypical relative to traditional institutions. More than 75% of all new enrollments are transfers and more than half of all enrolled students are engaged in part-time study. As entering transfers, Empire State College students may enroll with any number of prior credits and experience, and the college does not systematically classify students by class standing. Empire State College students do not exhibit consistent enrollment patterns[4] over consecutive terms and, in keeping with the flexible nature of the college, individual course loads may vary term to term.

Figure 1 illustrates the variation of enrollment patterns and the duration of enrollment among undergraduate students at Empire State College. The numbers across the top of the table represent consecutive terms. Term 1 represents the spring term, 2 indicates summer, 3 is fall and so on. Dark vertical lines appearing to the left and right of each row indicate matriculation and graduation points respectively. Lightly shaded cells with numbers indicate credits attempted in a given term. Student engagement most often occurs on a part time basis (<12 credits) and is followed by periods of inactivity (dark shading) between re-enrollment.

Figure 1.Undergraduate enrollment activity at Empire State College

	Credits Attempted by Term of Enrollment: Spring 1996 Through Fall 2004																									
	Consecutive Terms																									
ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	4		4				4													4	8	8	4	12	4		
2					4													8	8	8	8	8		8			
3					16	16		10	12		12	12											16				
4										8					7	8		7					3				
5													8		8	8		8	4	4	8						

Note: ID refers to a particular student; the numbers across the top of Table 1 represent each term beginning with Spring 1996; the numbers in each cell represent the number of credits attempted; shaded cells without a number represent periods of non-enrollment, white boxes pre-date engagement at the college or represent a post-graduation period.

[3] The Federal Student Right to Know Campus and Security Act of 1991 requires higher education institutions to publicly disclose retention and degree completion information. The Higher Education Act of 1992 requires that all Title IV eligible institutions must complete IPEDS surveys. Institutions that do not enroll *any* full-time, first-time undergraduates are not required to complete Student Financial Aid or Graduation Rate Surveys. Currently, there are no exceptions made for institutions predominantly serving transfer, or nontraditional students.

[4] Individuals who apply and are admitted can enroll at any time (within 3 years of the orientation date) and re-enroll in any subsequent term(s) within 3 years of the last enrollment. Matriculation occurs upon the first enrollment after admission to the college. Students who do not re-enroll within 3 years of the last enrollment are required to re-apply before engaging in further study. Non-matriculated (non-degree seeking) students are not required to formally apply to the institution.

Applying conventional retention methodologies to this selection of students is challenging in a number of ways. Each of these students initially enrolled in spring or summer terms and only one of them (ID 3) studied full-time during the initial enrollment. At one time or another each of these students *did* study in a fall term, but conventional practice that follows tracking the *entering fall cohort* exclusively.

An alternative approach to calculating retention at Empire State College involves a more broadly defined cohort, which is tracked consistently over *each* term subsequent to initial enrollment or matriculation over an infinite period of time.

A term-to-term retention model was developed based on the notion that students can be grouped into three distinct categories in any given term: *enrolled*, *non-enrolled* or *graduated* in a given term. The retention rate is calculated based on the proportion of students who are enrolled and graduated divided by the number of students being tracked (cohort N).

Cohorts were developed based on the term of initial entry (first enrollment). Credit load and entry status were not relevant to cohort establishment. Terms were defined consistent with the college's current term structure: Fall (July 1 - November 17), Spring (November 18 – March 9) and Summer (March 10 – June 30). Matriculated and non-matriculated students were distinguished with a binary code and tracked separately.

Two cohorts of students (matriculated and non-matriculated) were established based on enrollment status in the fall term of 1996. Queries were used to identify and extract enrollment and degree award data for each consecutive term between Fall 1996 and Summer 2004. This information was used to create one longitudinal, unit record dataset where each term was represented as its own variable. Two sets of term variables were established: one to capture enrollment data (credits attempted) and one to capture degree award data (degree type).

A student was considered enrolled if credits were attempted in a given term. In other words, if an enrollment term variable contained a value greater than 0, a student was conceptualized as being 'enrolled' for that term. The same logic was used to make aggregate determinations regarding degree awards in each term. Frequencies on enrollments and degrees awarded in each term were used to generate enrollment, graduation and retention rates by term.

Table 1 provides a partial depiction of the data for matriculated students. Raw data appears in the upper third of the table and identifies cohort enrollments and degree awards over consecutive terms; cumulative degree award counts are also documented. Students who obtained multiple degrees were identified and adjustments were made to avoid counting students twice.

Adjusted student counts appear in the middle rows, and these form the basis of calculated graduation and retention rates. Occasionally students were enrolled in the same term that a degree was awarded. The *adjusted enrollments* row reflects the removal of these students from the *enrolled* category, so that they are only counted once (in the graduated count). *Adjusted grads* represents the actual number of students who graduated (versus number of degrees awarded) and reflects the adjustment made for individuals who attained more than one degree.

The adjustment was made at the term in which subsequent degrees were awarded. Term by term enrollment, graduation and retention rates appear in the lower third of the table. By applying decision rules and making calculated adjustments, it is possible to categorize students as being actively enrolled, graduated, or non-enrolled (inactive) in any given term such that each group represents a proportion of the cohort.

Table 1. Cohort status by term

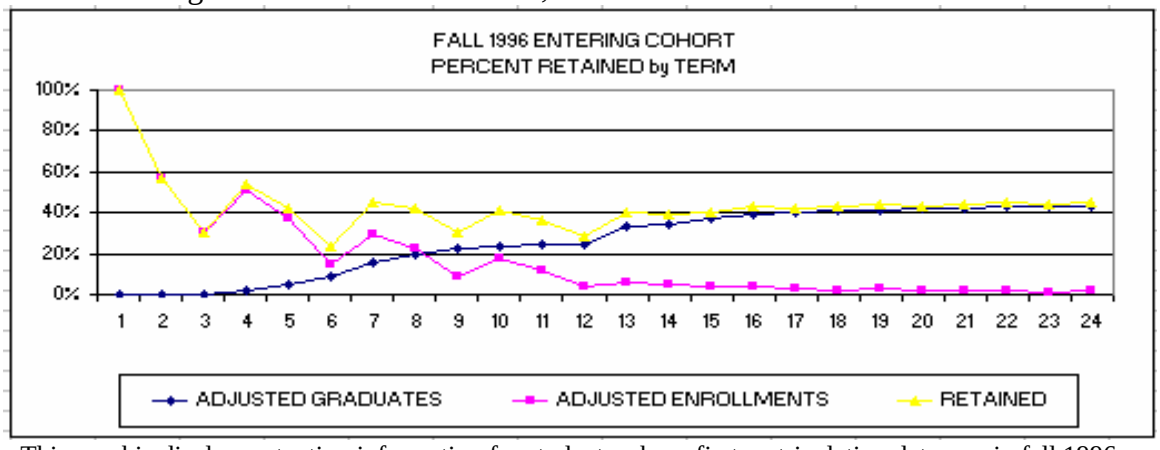
Cohort Status	FA 96	SP 97	SU 97	FA 97	SP 98	SU 98	FA 02	SP 03	SU 03	FA 03	SP 04	SU 04
Enrolled	1754	995	536	904	668	261	52	33	29	34	25	26
Degrees Awarded	0	1	7	33	38	75	16	3	14	14	5	5
Cummulative Degree Awards	0	1	8	41	79	154	789	792	806	820	825	830
Concurrent Enrollments and Degrees	0	0	3	2	6	2	0	1	0	0	0	0
Adjusted Enrollments	1754	995	533	902	662	259	52	32	29	34	25	26
Adjusted Grads	0	1	7	32	38	75	13	3	12	8	5	3
Cummulative Adjusted Grads	0	1	8	40	78	153	729	732	744	752	757	760
Adjusted Grads	*0.0%*	*0.1%*	*0.5%*	*2.3%*	*4.4%*	*8.7%*	41.6%	41.7%	42.4%	42.9%	43.2%	43.3%
Adjusted Enrollments	*100.0%*	*56.7%*	*30.4%*	*51.4%*	*37.7%*	*14.8%*	3.0%	1.8%	1.7%	1.9%	1.4%	1.5%
Retained	*100.0%*	*56.8%*	*30.8%*	*53.7%*	*42.2%*	*23.5%*	44.5%	43.6%	44.1%	44.8%	44.6%	44.8%

Results

The methodology outlined above was used to generate retention data on the entering cohort of matriculated undergraduates during the fall 1996 term. Results from the first iteration using this methodology yielded a 39% retention rate and a 37% graduation rate five years subsequent to initial enrollment. The fall 1996 cohort was followed term to term through Summer 2004, yielding an 8-year retention rate of 47%, and a 45% graduation rate for matriculated undergraduate students.

Figure 2 reveals that retention is highest in fall terms and lower in spring and summer terms respectively. At the three year mark (9 terms) the number of graduates surpasses enrollments and the number of graduates steadily increases, with the most rapid increase between the twelfth and thirteenth terms (about 4 years). From that point, there are small gradual increases in the number of graduates until the sixteenth term, when the number of graduates (as well as the number retained) sustains itself around 45%.

Figure 2. 8-Year Enrollment, Graduation and Retention Patterns



Note: This graphic displays retention information for students whose first matriculation date was in fall 1996.

Retention rates for non-matriculated students revealed much different results. By summer 2004, non-matriculated students were retained at a rate of 14%. Non-matriculated students were less likely to be retained in a second term, but the proclivity to engage more frequently in fall terms was similar to matriculated counterparts.[5]

Discussion / Conclusions

For the time being, reporting retention and graduation rate data in the context of the first-time, full-time cohort may satiate federal agencies, but when this information is broadly applied as an indicator of institutional success among nontraditional institutions it is misleading, at best. It fails to acknowledge continued growth in the numbers of transfer students pursuing part-time undergraduate study and the institutions and programs that have been designed to serve them. The goal of this study was to provide a baseline calculation of retention using a simple, broadly defined approach that is sensitive to characteristics of a highly nontraditional population. It is the first step in an institutional attempt to learn more about itself, and its students' behaviors.

The methodology proposed in this study remains subject to further revision and enhancements. The current results do not fully reflect variability of student behaviors, or the flexibility of the institution. Expanded data collection would capture the extent and nature of this variance, and will include other data elements such as GPA, primary mode of study and financial aid status, among others. Additionally, expanded enrollment categories and decision rules will quantify enrollment behaviors and phenomena that were previously not considered, such as patterns of multiple degree awards, and types of attrition. Once data collection and related processes have been refined and validated, work will begin on tracking additional cohorts.

Future studies on a more robust dataset will include analyses to determine differences between groups based on selected demographic and enrollment characteristics. Multivariate statistics will be used to determine empirically what factors influence student retention and attrition at Empire State College. Information about these factors may be used to identify possible interventions for at-risk students. Results from empirical analyses may also be interpreted concurrently with other institutional assessments and reviews of existing institutional policy and practice.

References

Adelman, C. (1999). *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment.* Washington, DC: U.S. Department of Education.

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

Bean, J.P. (1980). Dropouts and turnover: The synthesis and test of a causal model of student attrition. *Research in Higher Education,*12(2).

[5] It should be noted that some number of non-matriculated students did matriculate and attain degrees at ESC; however, cohort assignments remained static in this analysis.

Bean, J.P. (1982). An application of a model of turnover in work organizations to the student attrition process. *The Review of Higher Education*, 6, No. 2, 129-148.

Bean J. P. & Eaton, S.B. (2000). A psychological model of college student retention. In J.M. Braxton (Ed.), *Reworking the student departure puzzle*. Nashville: Vanderbilt University Press.

Braxton, J. M., & Hirshy, A. S. (2005). Theoretical developments in the study of college student departure. In A. Seidman (Ed.). College student retention: Formula for student success. Westport, CT: Praeger Publishers. pp.61-87.

Cabrera, A.F., Castaneda, M.B., Nora A., and Hengstler, D. (1992). The convergence between two theories of college persistence. *Journal of Higher Education, 63*(2), 143-164.

Choy, S. (2002) *The Condition of Education 2002* (NCES 2002-012). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Eaton, S.B. & Bean, J.P. (1995). An approach/avoidance behavior model of college student attrition. *Research in Higher Education, 36*(6), 617-645.

Gigliotti, R.J.& Huff, H.K. (1995). Role-related conflicts, strains and stresses of older-adult college students. *Sociological Focus*, (28) 3: 329-342.

Hagedorn, L. S. (2005a). How to define retention: A new look at an old problem. In A. Seidman (Ed.). College student retention: Formula for student success. pp. 89- 105. Westport, CT: Praeger Publishers.

Hagedorn, L. S. (2005b). Square pegs - adult students and their "fit" in postsecondary institutions. *Change*, January/February 2005, 22-29.

Han, T. E., & Nesler, M. S. (2002). Determinants of student dropout during a critical period: Cohort differences at a virtual university. *Proceedings of the North East Association for Institutional Research*, 45-54.

Horn, L.J., & Carroll, C. D. (1996). *Nontraditional undergraduates: Trends in enrollment from 1986 to 1992 and persistence and attainment among 1989 and 1990 beginning postsecondary students* (Report No. NCES 97-578). U.S. Department of Education, National Center for Education Statistics.

Hussar, W.J. (2005). *Projections of education statistics to 2014*. (NCES 2005-074). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Kemp, W. (2002). Persistence of adult learners in distance education. *American Journal of Distance Education, 16*(2), 65-81.

Kennedy, P. & Scheckley, B.G. (1999). Attrition and persistence in higher education: A review of the literature. College Park, MD: *Institute for Research and Assessment in Higher Education, University of Maryland, University College.*

Kim, K., Collins, M., Stowe, P., & Chandler, K. (1995). Forty percent of adults participate in adult education activities: 1995-95 (NCES 1995-823). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Nesler, M.S., & Hanner, M.B. (1998, February). *Retention of non-traditional nursing students: Searching for predictors.* Paper presented at the 69th Annual Meeting of the Eastern Psychological Association, Boston, MA.

Nesler, M. S., & Gunnarsson, R. (2000). Adult education in the 1990s: An analysis of the 1995 National Household Education Survey database. *Proceedings of the North East Association for Institutional Research,* 143-156.

Swail, W.S., Redd, K.E., & Perna, L.W. (2003) *Retaining minority students in higher education.* San Francisco: Jossey-Bass.

Tinto, V. (1975). Dropout from higher education: A theoretical synthesis of recent research. *Review of Higher Education, 45* (1) 89-125.

Tinto, V. (1982). Limits of theory and practice in student attrition. *Journal of Higher Education, 53(6),* 687-700.

Tinto, V. (1988). Stages of student departure: reflections on the longitudinal character of student leaving. *Journal of Higher Education, 59,* 438-455.

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

Wirt, J., Choy, S., Rooney, P., Provasnik, S., Sen, A., and Tobin, R. (2004). *The Condition of Education 2004* (NCES 2004-077). U.S. Department of Education, National Center for Education Statistics. Washington, DC: U.S. Government Printing Office.

Editor's Note – Best IR Report/Practitioner Paper:

The following paper is the winner of NEAIR's first Best IR Report/Practitioner Paper. The award was developed in 2005 to showcase the work presented at the Annual Conference of a more practical and less scholarly nature. Those presenting workshares and posters, as well as those presenting in the contributed paper format, were encouraged to submit their work for this award.

The award was, in part, a result of conversations inspired by last year's Community of Practice sessions discussing the contributions of both practical and scholarly work in the IR field. It also acknowledged the growing importance of the poster session in the NEAIR program. Since its inception at the 2002 Cambridge conference the poster session has grown in number as well as in popularity. This year's winning submission was presented as a poster during the "Data with a Twist" poster session on Monday evening.

The submissions received by the committee represented the wide variety in practical work done by IR professionals and represented the creativity and excellence that can be achieved in this format. The selection committee had a formidable task in selecting only one as the first recipient of this award.

The following criteria were used when considering the submissions for this award.

1. Context and importance of question: Does the report/paper address a question of relevance and importance to its audience?
2. Quality of data and analytic approach: Does the report/paper utilize data of sufficient quality to answer the questions asked? Are the analyses appropriate given the quality of the data and the question being answered? Will the intended audience understand the analyses and their conclusions?
3. Creativity of approach: Does the report/paper approach the question in a new or novel way? Are data collected in a novel way or are existing data used in a creative way?
4. Generalizability: Is this approach or solution one that can contribute to others in the profession as they examine similar questions? Will the results add to the general body of knowledge?

"An Analysis of Time to Degree and Credit Hour Workload by Select Programs: 2003-04 Transcript Study" by Pat Mizak of Canisius College was selected as the winner of NEAIR's first Best IR Report/Practitioner Paper Award. The selection committee noted that the paper addressed a relevant issue in a manner that could be used by other members, including those at institutions with modest IR resources. In his cover sheet, the author noted that this was done in his first year of employment in a new, single-person IR office. Although its impact on campus is still to be determined, the paper has been distributed to campus leaders and has generated discussion of important issues on campus.

NEAIR was pleased to lead the way in offering a venue for recognition of our poster presenters as well as the more practical work often presented in workshares; it is our hope that this model can be used by other AIR affiliates.

An Analysis of Time to Degree and Credit Hour Workload by Select Programs: 2003-04 Transcript Study

Pat Mizak
Director of Institutional Research
Canisius College

OVERVIEW

INTRODUCTION

At the behest of several units, with Enrollment Management leading the way, the Institutional Research (IR) office was asked to investigate how the core curriculum affects specific programs at Canisius. With such an open ended request, it was unsure where the research process would lead. Beginning in spring 2005, IR began exploring the following questions:
What are the credit hour requirements of individual programs?
How are these credit hours divided among core curriculum and major requirements, as well as true free electives?
How do these requirements effect time to graduate?
Is there a correlation between program requirements and secondary educational experiences such as Study Abroad and minors?

PROCESS

There are three stages of the project:
1) Presentation of a list of all undergraduate degree programs and their credit hour requirements.
2) Ascertaining what is the exact "time to degree" of all 2003-04 graduates in terms of semesters attended.
3) Creating and analyzing a sample of transcripts of 2003-04 graduates. The transcript study would be the "meat and potatoes" of this project. It was decided that either programs would be targeted in the transcript sample. They are: adolescence education, biology, chemistry, childhood education, computer science, dual early childhood/childhood education, mathematics and statistics, and physical/health education.

TRANSCRIPT STUDY METHODOLOGY

159 single major students graduated in 2003-04 with degrees in our study group. These student transcripts were generated and entered, course by course, term by term into an Excel spreadsheet; over 8,200 entries in total. Each course was evaluated in order to determine whether the course was taken to fulfill a major or core requirement; if it was determined that neither was the case, then the course would be coded as a "free elective." This data was then aggregated into term data and then finally a one-line summary of the transcript was created with fields dedicated to major courses/hours, core courses/hours, elective course/hours, AP courses/hours, transfer courses/hours, non-Canisius courses/hours, Canisius courses/hours, total courses/hours, minor field of study, and any other notes (such as All-College Honors and Study Abroad).

THE RESULTS

STAGE ONE: HOURS EARNED AT GRADUATION

College of Arts and Sciences

Program	Min. Hours	Avg. Hours
Art History	120	123.7
Biochemistry	141-144	157.0
Bioinformatics	128-136	152.3
Biology	140-142	146.4
Chemistry	136-139	143.4
Clinical Lab Sci.	136-138	133.0
Communications	120	123.6
Computer Science	125-131	137.4
Criminal Justice	120	125.1
Digital Media Arts	120	124.4
English	120	129.8
Environ. Science	126-127	131.0
History	120	124.5
Int'l Relations	120	121.5
Math & Statistics	126-132	135.5
Philosophy	120	137.3
Physics	136	147.0
Political Science	120	124.2
Psychology	120	125.9
Religious Studies	120	125.0
Social Sciences	120	129.7
Sociology	120	122.8
Tech. Studies	125	122.0

School of Education and Human Services

Program	Min. Hours	Avg. Hours
Adolescence Educaiton	127-155	127.5
Athletic Training	131	139.6
Childhood Ed.	128-139	134.4
EC/ Childhood Dual	134-145	138.4
Early Childhood	127-138	131.5
Physical Education	135-136	135.3
Spec. Ed/C'hood Dual	137-148	142.4
Spec. Ed/Early C'hood	137-151	136.9

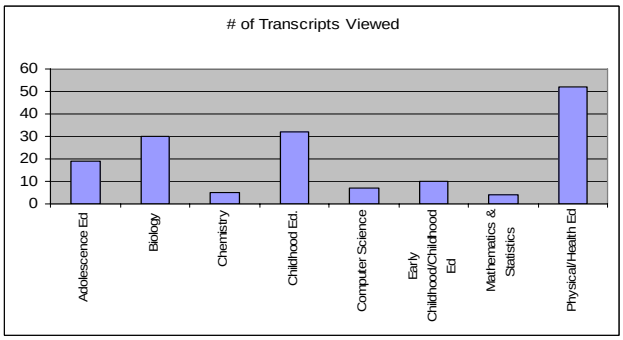
Wehle School of Business

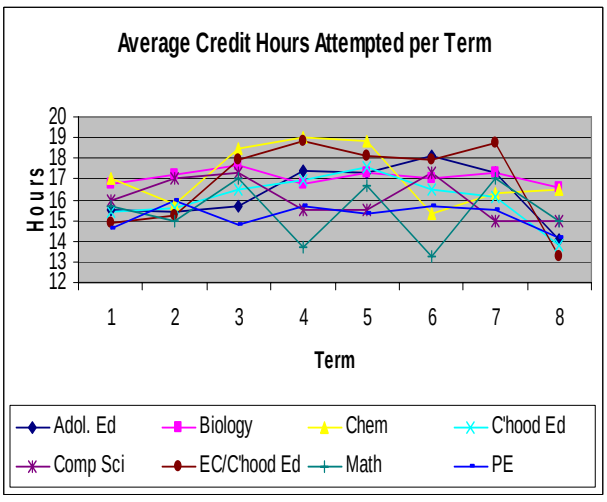
Program	Min. Hours	Avg. Hours
Accounting	126-127	127.2
Acct. Info. Sys.	120-121	125.7
Economics	120-121	127.5
Entrepreneurship	120-121	123.0
Finance	120-121	124.8
Information Sys.	120-121	127.2
Int'l Business	120-121	122.0
Management	120-121	127.2
Marketing	120-121	124.6

STAGE TWO: TIME TO DEGREE

PROGRAM	Total	4 years or less	4 to 5 years	5 to 6 years	over 6 years
Adolescence Education	16	100.0%	0.0%	0.0%	0.0%
Political Science	8	100.0%	0.0%	0.0%	0.0%
Mathematics & Statistics	4	100.0%	0.0%	0.0%	0.0%
Physical/Health Education	3	100.0%	0.0%	0.0%	0.0%
Bioinformatics	2	100.0%	0.0%	0.0%	0.0%
International Business	2	100.0%	0.0%	0.0%	0.0%
Physics	2	100.0%	0.0%	0.0%	0.0%
Religious Studies	2	100.0%	0.0%	0.0%	0.0%
Accounting Info Sys.	1	100.0%	0.0%	0.0%	0.0%
Clinical Laboratory Science	1	100.0%	0.0%	0.0%	0.0%
Sociology/Anthropology	1	100.0%	0.0%	0.0%	0.0%
Special/Early Childhood, B-2	1	100.0%	0.0%	0.0%	0.0%
Social Science	1	100.0%	0.0%	0.0%	0.0%
Physical Education, B-12	19	94.7%	5.3%	0.0%	0.0%
Childhood Education	30	93.3%	6.7%	0.0%	0.0%
Early Childhood/Childhood Dual	10	90.0%	10.0%	0.0%	0.0%
Special/Childhood, 1-6	9	88.9%	0.0%	11.1%	0.0%
Accounting	18	83.3%	11.1%	0.0%	5.6%
Digital Media Arts	18	83.3%	11.1%	0.0%	5.6%
Hotel Management	6	83.3%	16.7%	0.0%	0.0%
Sociology	6	83.3%	0.0%	0.0%	16.7%
Athletic Training	10	80.0%	20.0%	0.0%	0.0%
Biology	28	75.0%	21.4%	0.0%	3.6%
Finance	28	75.0%	17.9%	3.6%	3.6%
History	8	75.0%	12.5%	0.0%	12.5%
Chemistry	4	75.0%	25.0%	0.0%	0.0%
Computer Science	4	75.0%	0.0%	0.0%	25.0%
Psychology	41	73.2%	9.8%	7.3%	9.8%
Information Systems	19	68.4%	21.1%	10.5%	0.0%
Management	31	67.7%	22.6%	0.0%	9.7%
Art History	3	66.7%	33.3%	0.0%	0.0%
Biochemistry	3	66.7%	33.3%	0.0%	0.0%
Communication Studies	44	65.9%	25.0%	4.5%	4.5%
English	9	55.6%	22.2%	11.1%	11.1%
Marketing	15	53.3%	33.3%	0.0%	13.3%
Criminal Justice	19	52.6%	36.8%	0.0%	10.5%
Social Studies	4	50.0%	50.0%	0.0%	0.0%
Economics	2	50.0%	50.0%	0.0%	0.0%
Elementary Education	2	50.0%	0.0%	0.0%	50.0%
Humanities	2	50.0%	50.0%	0.0%	0.0%
Elementary/Early Secondary Ed	14	28.6%	57.1%	7.1%	7.1%
Physical Education	17	23.5%	41.2%	17.6%	17.6%
Teacher Education	7	0.0%	85.7%	0.0%	14.3%
Special Education	4	0.0%	25.0%	25.0%	50.0%
Environmental Science	1	0.0%	0.0%	0.0%	100.0%
TOTAL	**479**	**71.4%**	**19.2%**	**3.1%**	**6.3%**

STAGE THREE: THE TRANSCRIPT STUDY





CONCLUSIONS

- Transfer credit is common among all programs.
- Summer school if fairly common.
- Few education students participate in All-College Honors.
- AP credit is rare among education majors.
- Science students tend to transfer major credits, while education students transfer in core credits.
- Even with high credit hour requirements, students in hard sciences and education are still gradating in four years.
- Education programs offer little opportunity for minors or double majors.
- Education students tend to take core classes first, then major courses; science majors tend to be more balanced.
- Over 20% of biology, chemistry, and adolescence education students must take an overload (19+ hours) in at least one term.
- Due to various exceptions and waivers, the ubiquity of the "core curriculum" is problematic.

AN ANALYSIS OF TIME TO DEGREE AND CREDIT HOUR WORKLOAD BY SELECT PROGRAMS 2003-04 TRANSCRIPT STUDY

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Overview

At the behest of several units, with Enrollment Management leading the way, the Institutional Research (IR) office was asked to investigate how the core curriculum affects specific programs at Canisius. With such an open ended request, it was unsure where the research process would lead. Beginning in spring 2005, IR began exploring the following questions:

1) What are the credit hour requirements of individual programs?
2) How are these credit hours divided among core curriculum and major requirements, as well as true free electives?
3) How do these requirements effect time to graduate?
4) Is there a correlation between program requirements and secondary educational experiences such as Study Abroad and minors?

This document will offer a step-by-step journey into how IR investigated this query. Not only does this study offer insight into enrollment management issues, it also illustrates how institutional research can be utilized to examine very complicated issues related to the university.

First Stage – Degree Requirements

The first task of the project was to clearly define the research questions. The 2003-05 Undergraduate Catalog states: "To earn a bachelor's degree from Canisius College, the student must complete a minimal of 120 credit hours." (page 39) However, the Catalog only gives the *minimum* requirements; it is common knowledge that several programs have internal requirements which far exceed 120 hours. Additionally, it is clear that the majority of students graduate with *more* credit hours than their program's minimum. On the next page is a listing of programs, minimum credit hour requirements, and the average earned credit hours of 2003-04 graduates. Appendix A offers a full five year study of earned credit hour averages; and Appendix B details the ranges of earned credit hours for graduates from the past five years.

Average Earned Credit Hours at Graduation, 2003-04 (excluding double majors)

College of Arts and Sciences

Program	Min. Hours	Avg. Hours
Art History	120	123.7
Biochemistry	141-144	157.0
Bioinformatics	128-136	152.3
Biology	140-142	146.4
Chemistry	136-139	143.4
Clinical Lab Sci.	136-138	133.0
Communications	120	123.6
Computer Science	125-131	137.4
Criminal Justice	120	125.1
Digital Media Arts	120	124.4
English	120	129.8
Environ. Science	126-127	131.0
History	120	124.5
Int'l Relations	120	121.5
Math & Statistics	126-132	135.5
Philosophy	120	137.3
Physics	136	147.0
Political Science	120	124.2
Psychology	120	125.9
Religious Studies	120	125.0
Social Sciences	120	129.7
Sociology	120	122.8
Tech. Studies	125	122.0

School of Education & Human Services

Program	Min. Hours	Avg. Hours
Adolescence Ed.	127-155	127.5
Athletic Training	131	139.6
Childhood Ed.	128-139	134.4
EC/ C'hood Dual	134-145	138.4
Early Childhood	127-138	131.5
Physical Education	135-136	135.3
Spec. Ed/C'hood	137-148	142.4
Spec. Ed/EC	137-151	136.9

Wehle School of Business

Program	Min. Hours	Avg. Hours
Accounting	126-127	127.2
Acct. Info. Sys.	120-121	125.7
Economics	120-121	127.5
Entrepreneurship	120-121	123.0
Finance	120-121	124.8
Information Sys.	120-121	127.2
Int'l Business	120-121	122.0
Management	120-121	127.2
Marketing	120-121	124.6

As shown above, high credit hour programs tend to be in the natural sciences and education. Humanities, social sciences, and business programs remain fairly close to the 120 hour minimum. This is when questions of equity and fairness start appearing. To obtain the minimum of 120 credit hours and graduate in the traditional four years, a student at Canisius can average earning 15 credit hours a semester for eight semesters. A biology major must average 17.5 hours, an adolescence education major with a biology specialization must average 18.9 hours to graduate in the same period of time.

Second Stage – Time To Graduate

After noticing that the natural sciences and education carry heavy credit hour burdens, the question is asked, "So are these students still graduating in four years?" Surprisingly enough, the answer is yes. Appendix C illustrates the percentage of 2003-04 graduates who received their degree in four years. Students with more than 30 credit hours, and those with multiple majors, have been removed from this part of the study.

Here is a list of popular programs and their four year graduation rates*.

* By graduation rate, we are not referring to the traditional IPEDS definition of number of first time, full time that graduate within a given period, but rather we are measure what percentage of graduates graduate within a particular period; in our case here, four years.

4 Year Grad Rate Class of 2004 (minimum 10 graduates)

Program	Rate
Adolescence Ed.	100.0%
Political Science	100.0%
Physical Ed, B-12	97.4%
Childhood Ed.	93.3%
Early C'hood/C'hood Dual	90.0%
Accounting	83.3%
Digital Media Arts	83.3%
Athletic Training	80.0%
Biology	75.0%
Finance	75.0%

Program	Rate
Psychology	73.2%
Information Systems	68.4%
Management	67.7%
Communication Studies	65.9%
Marketing	53.3%
Criminal Justice	53.6%
Elementary/Early Sec. Ed.	28.6%
Physical Education	23.5%

Although it may not be statistically significant, it appears that there may be an inverse relationship between required program credit hours and graduation rate. It is clear that programs with high credit hour burdens are *not* preventing students from graduating in four years.

Third Stage – Transcript Study

After reporting the results of stages one and two to Enrollment Management and Academic Affairs, it was determined that further, more detailed study was necessary. Eight programs were chosen for extensive investigation. They were: adolescence education, biology, chemistry, childhood education, computer science, the early childhood/childhood education dual degree, mathematics and statistics, and physical/health education. For the 2003-04 academic year, all transcripts of these program completers would be examined to look for trends and other illuminating information.

The following specific research questions were generated:

1) What is the average credit hour load per semester?
2) How is students' class loads divided between core, major, and elective courses?
3) Do these students have minors, study abroad, or are members of All-College Honors?
4) Do these students rely on summer classes or transfer credit from other institutions?
5) How does AP credit affect these students?

Transcript Study – The process

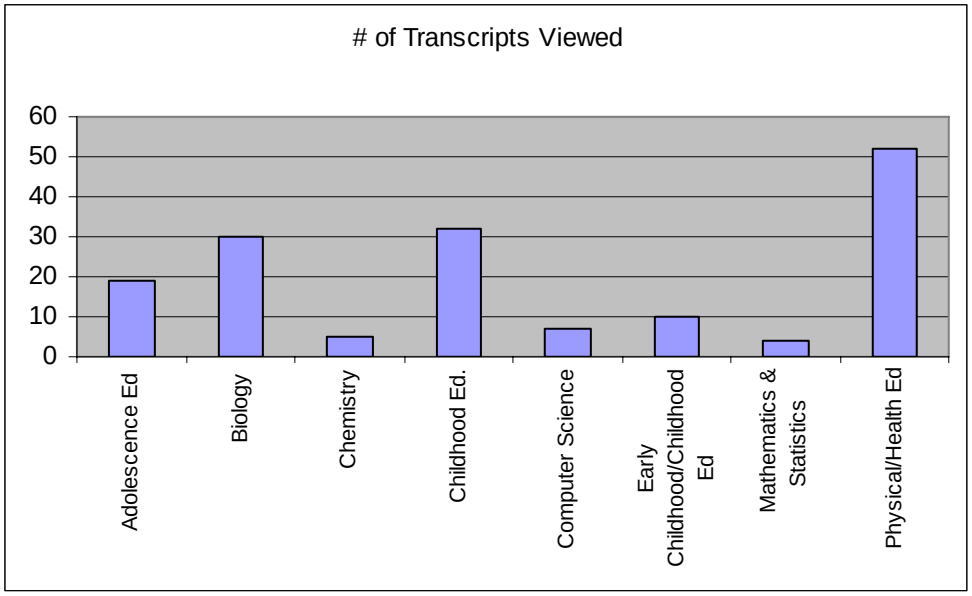
One hundred fifty nine (159) single major students graduated in 2003-04 with degrees in our study group. These student transcripts were generated and entered, course by course, term by term into an Excel spreadsheet; over 8,200 entries in total. Each course

was evaluated in order to determine whether the course was taken to fulfill a major or core requirement; if it was determined that neither was the case, then the course would be coded as a "free elective." This data was then aggregated into term data and then finally a one-line summary of the transcript was created with fields dedicated to major courses/hours, core courses/hours, elective course/hours, AP courses/hours, transfer courses/hours, non-Canisius courses/hours, Canisius courses/hours, total courses/hours, minor field of study, and any other notes (such as All-College Honors and Study Abroad). A copy of the raw data can be obtained by contacting IR.

Attention was directed towards when the student matriculated to Canisius, in order to make certain that the requirements the student was presented with corresponds to the applicable "catalog year." Although requirements for the science programs were basically unchanged between the 1999 and 2001 catalogues, there were some subtle changes to the education programs.

Transcript Study – The Results

The following section will give summary data concerning the results of the transcript study. Attached is Appendix D which is the entire data set generated from the study.



Secondary Academic Information

Program	All-College Honors	Study Abroad	AP Credit	Summer Credit	Minors
Adolescence Ed	5.3%	5.3%	5.3%	5.3%	0.0%
Biology	33.3%	3.3%	53.3%	26.7%	20.0%
Chemistry	0.0%	0.0%	20.0%	20.0%	0.0%
Childhood Ed.	9.4%	15.6%	3.1%	18.8%	0.0%
Computer Science	14.3%	0.0%	28.6%	28.6%	14.3%
Early Childhood/Childhood Ed	20.0%	10.0%	10.0%	0.0%	0.0%
Mathematics & Statistics	25.0%	25.0%	25.0%	25.0%	75.0%
Physical/Health Ed	0.0%	0.0%	1.9%	36.5%	0.0%

A few items of note concerning this data:

- Summer school is fairly common.
- AP credit is rare among education majors.
- Minors are non-existent among education majors.
- Few education students participate in All-College Honors.

Transfer Information: Students earning credit from outside institutions.

Program	Any	1-15 Hours	16-30 Hours	31-60 Hours	61+ Hours
Adolescence Ed	68.4%	47.4%	5.3%	10.5%	5.3%
Biology	56.7%	46.7%	10.0%	0.0%	0.0%
Chemistry	60.0%	40.0%	20.0%	0.0%	0.0%
Childhood Ed.	65.6%	59.4%	3.1%	3.1%	0.0%
Computer Science	71.4%	28.6%	0.0%	0.0%	42.9%
Early Childhood/Childhood Ed	70.0%	60.0%	10.0%	0.0%	0.0%
Mathematics & Statistics	100.0%	75.0%	25.0%	0.0%	0.0%
Physical/Health Ed	71.2%	26.9%	7.7%	11.5%	25.0%

- Transfer credit is very common among *all* programs.
- The majority of students with transfer credit earn between one to 15 hours.
- The bulk of transfer credit is from ECC and UB.

Non-Canisius Credit (transfer and AP credit) by Area

Program	Core	Major	Elective
Adolescence Ed	42.4%	21.9%	35.6%
Biology	9.1%	68.8%	22.2%
Chemistry	23.6%	46.4%	30.0%
Childhood Ed.	43.9%	24.7%	31.3%
Computer Science	33.8%	34.1%	32.1%
Early Childhood/Childhood Ed	45.6%	46.8%	7.6%
Mathematics & Statistics	15.0%	30.0%	55.0%
Physical/Health Ed	42.4%	39.1%	18.5%

- Science majors tend to transfer in majors credits while education majors tend to transfer core credits.

- May times, elective credits are due to students transferring to Canisius from another school where they had a different major.
- Elective credit awarded for some AP tests.

Attempted Credit Hours at Graduation

Program	120-29	130-39	140-49	150-59	160+
Adolescence Ed	15.8%	57.9%	5.3%	10.5%	10.5%
Biology	3.3%	0.0%	53.3%	33.3%	10.0%
Chemistry	0.0%	20.0%	80.0%	0.0%	0.0%
Childhood Ed.	28.1%	50.0%	12.5%	9.4%	0.0%
Computer Science	0.0%	71.4%	28.6%	0.0%	0.0%
Early Childhood/Childhood Ed	0.0%	80.0%	10.0%	10.0%	0.0%
Mathematics & Statistics	0.0%	75.0%	25.0%	0.0%	0.0%
Physical/Health Ed	19.2%	59.6%	11.5%	3.8%	5.8%

# of Terms (non-summer) Enrolled (students with 16+ transfer hours are *excluded*)

Program	#	7 or less	8	9	10 or more
Adolescence Ed	15	0.0%	100.0%	0.0%	0.0%
Biology	27	3.7%	92.6%	3.7%	0.0%
Chemistry	4	0.0%	75.0%	25.0%	0.0%
Childhood Ed.	30	0.0%	96.7%	0.0%	3.3%
Computer Science	4	0.0%	100.0%	0.0%	0.0%
Early Childhood/Childhood Ed	9	0.0%	100.0%	0.0%	0.0%
Mathematics & Statistics	3	0.0%	100.0%	0.0%	0.0%
Physical/Health Ed	29	0.0%	69.0%	24.1%	6.9%

- Even with high credit hour requirements, these students are graduating in four years (8 terms).
- These students bring with them substantial summer and transfer credit.

Average Attempted Credit Hours by Area

Program	Core	Major	Elective
Adolescence Ed	29.3%	63.2%	7.5%
Biology	32.8%	57.6%	9.3%
Chemistry	34.4%	59.9%	5.5%
Childhood Ed.	31.2%	62.0%	6.7%
Computer Science	33.9%	49.7%	16.8%
Early Childhood/Childhood Ed	30.5%	67.6%	2.1%
Mathematics & Statistics	34.7%	40.3%	25.1%
Physical/Health Ed	30.1%	63.7%	6.2%

- Education programs have little opportunity for students to take free electives—they are essentially double majoring in curriculum/instruction and their concentration area.
- Low program credit hours requirements allow computer science and mathematics to enroll in more electives and earn minors.

Attempted Credit Hours by Term (excluding students with 16+ transfer hours)

	Freshman		Sophomore		Junior		Senior	
Program	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Adolescence Ed	15.5	15.4	15.7	17.4	17.3	18.1	17.3	14.1
Biology	16.8	17.2	17.7	16.8	17.3	17.0	17.3	16.6
Chemistry	17.0	15.8	18.5	19.0	18.8	15.3	16.3	16.5
Childhood Ed.	15.4	15.6	16.5	16.9	17.6	16.5	16.1	13.8
Computer Science	16.0	17.0	17.3	15.5	15.5	17.3	15.0	15.0
Early Childhood/Childhood Ed	14.9	15.2	17.9	18.8	18.1	17.9	18.7	13.3
Mathematics & Statistics	15.7	15.0	17.0	13.7	16.7	13.3	17.0	15.0
Physical/Health Ed	14.6	16.0	14.8	15.7	15.3	15.7	15.5	14.2

Attempted Core Credit Hours by Term (excluding students with 16+ transfer hours)

	Freshman		Sophomore		Junior		Senior	
Program	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Adolescence Ed	11.7	11.7	5.5	5.0	2.4	3.2	2.5	0.7
Biology	4.0	7.1	7.2	7.1	7.6	5.4	6.2	5.9
Chemistry	3.0	5.3	7.3	8.0	6.3	4.8	4.0	9.5
Childhood Ed.	9.6	9.6	7.4	4.3	2.5	3.7	2.3	0.3
Computer Science	7.5	8.3	6.8	4.5	7.5	6.0	5.5	3.3
Early Childhood/Childhood Ed	10.9	9.6	4.6	3.8	3.8	2.8	4.0	0.3
Mathematics & Statistics	7.7	7.0	9.0	6.0	4.0	4.0	5.0	3.0
Physical/Health Ed	6.7	6.8	4.9	2.9	3.5	3.7	6.9	2.2

Attempted Major Credit Hours by Term (excluding students with 16+ transfer hours)

	Freshman		Sophomore		Junior		Senior	
Program	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Adolescence Ed	3.3	3.1	10.2	11.8	14.1	13.9	14.2	12.6
Biology	12.7	12.9	10.1	9.2	9.2	10.0	9.3	7.7
Chemistry	14.0	10.5	11.3	11.0	12.5	10.5	12.3	6.3
Childhood Ed.	4.9	5.1	8.7	12.1	14.2	11.0	12.1	13.3
Computer Science	7.8	8.0	8.0	9.0	7.3	6.8	5.3	8.8
Early Childhood/Childhood Ed	4.0	4.0	13.3	15.0	14.0	14.8	14.7	13.0
Mathematics & Statistics	3.0	5.0	4.3	5.3	10.3	7.3	9.0	4.7
Physical/Health Ed	5.0	8.2	9.4	12.0	11.3	11.8	7.6	11.6

- Education majors take their core classes early and major classes later.
- Science majors tend to be more balanced.

% of Terms with Overloads (19+ attempted credit hours)

Program	Overload %
Adolescence Ed	20.8%
Biology	21.8%
Chemistry	25.7%
Childhood Ed.	11.5%
Computer Science	6.5%
Early Childhood/Childhood Ed	18.8%
Mathematics & Statistics	9.7%
Physical/Health Ed	9.2%

Final Thoughts

This study attempts to shed some light on the complex question of program requirements and how students negotiate their way from matriculation to graduation. Our research here only gauges the "what" not the "why" and is also very insular, only Canisius data is used here.

Additional research can be directed at answering the following questions:

1) Are these programs more burdensome than comparative programs at other institutions?
2) Even with their high program requirements, science majors participate in All College Honors at a much higher rate than education majors. Why?
3) Is it a concern that summer school is so prevalent?
4) Most transfer credit is awarded to students who began their college career at Canisius, not typical "transfer students;" therefore, the College is losing possible revenue due to students taking summer work at less expensive institutions such as ECC and UB. How much is the College losing in potential revenue?
5) Should this basic transcript analysis be expanded to other programs? If yes, which?

An addendum to this study examines the current core requirements by program. It is quickly noticed that the core experience which Canisius takes great pride is quite different for students of different programs.

ADDENDUM

The "core" curriculum.

As defined in the 2005-07 Catalog:
"In keeping with its liberal arts ideals and objectives, Canisius College requires that all its students complete a rounded program of humanistic studies embracing art and literature, the physical and social sciences, oral and written communication, history, philosophy, religious studies, mathematics and foreign language…The core curriculum requirement totals 54 hours."

"Basic Core Requiements"
4 General Studies Courses (ENG101, ENG 101, PHI 101, RST101)
14 Courses form 7 or 8 areas, exemption for area of student's major.
18 Courses, 54 hours (can be more due to some four [and five] credit hour classes.)

18 Course/54 Credit Hour Core (one area exemption)

Communication Studies	Computer Science, BA
Digital Media Arts	English, BA
Art History	Music
History	Philosophy
Political Science	Religious Studies & Theology
Criminal Justice	Urban Studies

17 Course/51 Credit Hour Core (one and a half area exemptions)

Psychology (two form areas I, III, IV, V, VI, and VIII; one from VII)
Social Sciences (two from areas I, III, IV, V, VI, and VIII; one from VII – IV can be exempt for history specialization).
Anthropology (two from areas III, IV, V, VI, VII, and VIII; one from I)
Sociology (two form areas I, III, IV, V, VI, and VIII; one from VII)

16 Course/48 Credit Hour Core (two area exemptions)

Bioinformatics	Biology
Chemistry	Biochemistry
Computer Science, BS	Economics
Environmental Science	Mathematics (can exempt I or II)
Modern Languages	Physics
Marketing	Finance
Entrepreneurship	Information Systems
International Business	Management

15 Course/45 Credit Hour Core (two and a half area exemptions)

Athletic Training (two from areas III, IV, V, VI, and VIII, one from area VII)

14 Course/42 Credit Hour Core
Clinical Laboratory Science (two from areas II, III, IV, and VIII; one from V and VI)
Humanities (two from areas I, II, IV, VI, and VII)
International Relations (two from I, III, V, VI, and VII)

Accounting/AIS Core, 16 courses/48 Credit Hours
CSC106, ZAP300 PHI340 or PHI344, ENG389
One area I, two from areas IV, VI, and VIII.
One social science elective (area II?)

Education Core, 14 Courses/42 Credit Hours
One from areas I, III, IV, V, VI, VII, VIII; plus thee from any area except II, no more than one from any one area. Concentration may exempt another area.

Early Childhood, B-2
Childhood, 1-6
Early Childhood/Childhood Dual
Special/Early Childhood
Special/Childhood
Adolescence

Education Core, 13 Courses/39 Credit Hours
One from areas III, IV, V, VI, VII, and VIII, plus three from any area, except I and II; no more than one from any one area.

Physical Education/Health Dual
Physical Ed Teacher Certification

All-College Honors, 18 courses/54 Credit Hours
Math and Language requirements may be exempted due to major.

Core Requirements which are independent of the program of study and their percentage of minimum hour needed for completion.

College of Arts and Sciences

Program	#classes /hours	Min Hours	Core %
Bioinformatics	16/48	128	37.5%
Biology	16/48	140	34.3%
Chemistry	16/48	138	34.8%
Biochemistry	16/48	141	34.0%
Clinical Lab Science	14/42	136	30.9%
Communications	18/54	120	45.0%
Comp. Science, BA	18/54	125	43.2%
Comp. Science, BS	16/48	131	36.6%
Digital Media Arts	18/54	120	45.0%
Economics, BA	16/48	120	40.0%
English	18/54	120	45.0%
Environ. Science	16/48	126	42.9%
Art History	18/54	120	45.0%
Music	18/54	126	42.9%
History	18/54	120	45.0%
Humanities	14/42	120	35.0%
Int'l Relations	14/42	120	35.0%
Mathematics	16/48	126	38.1%
Modern Languages	16/48	120	40.0%
Philosophy	18/54	120	45.0%
Physics	16/48	136	35.3%
Political Science	18/54	120	45.0%
Psychology	17/51	120	42.5%
Religious Studies	18/54	120	45.0%
Social Sciences	17/51	120	42.5%
Anthropology	17/51	120	42.5%
Criminal Justice	18/54	120	45.0%
Sociology	17/51	120	42.5%
Urban Studies	18/54	121	44.6%

Wehle School of Business

Program	#classes/ /hours	Min Hours	Core %
Accounting	16/48	120	40.0%
Acct. Info Sys	16/48	120	40.0%
Economics	16/48	120	40.0%
Finance	16/48	120	40.0%
Entrepreneurship	16/48	120	40.0%
Infor. Systems	16/48	120	40.0%
Int'l Business	16/48	120	40.0%
Management	16/48	120	40.0%
Marketing	16/48	120	40.0%

School of Education & Health Services

Program	#classes/ /hours	Min Hours	Core %
Early C'hood, B-2	14/42	127	33.1%
Childhood, 1-6	14/42	128	32.8%
EC/C'hood Dual	14/42	134	31.3%
Special/EC Dual	14/42	137	30.7%
Spec./C'hood Dual	14/42	137	30.7%
Adolescence	14/42	127	33.1%
PE/Health Dual	13/39	135	28.9%
PE Teacher Cert.	13/39	129	30.2%
Athletic Training	15/45	130	34.6%

STUDENT SWIRL: A MATURING CONCEPT OF POSTSECONDARY ATTENDANCE

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The concept of student swirl has always existed in higher education, but was initially brought into the professional literature in the early 1990s. Interestingly enough, it was 'discovered' as 'reverse transfer' -- students moving from a four-year institution to a two-year institution. Simply stated, student swirl recognizes that progress from initial college entry to degree completion is neither place-bound (the same institution) nor status-bound (maintaining full-time or part-time status) nor time-bound (a combination of the two previous concepts with allowance for stopping-out).

More recently, Borden (2004) points to patterns of multi-institutional attendance. "Many faculty, administrators, policy-makers, and oversight bodies are not comfortable with the reality of postsecondary student flow." At least eight variations have been identified:

- trial enrollment (non-matriculated; pondering transfer?)
- special programs (only available at single institutions)
- supplemental enrollment (summers, intersession)
- rebounding enrollment (back and forth between institutions)
- concurrent enrollment (double-dipping)
- consolidated enrollment (using degree and residency requirements of one institution and courses from two or more others)
- serial transfer (many changes before the degree-granting institution)
- independent enrollment (personal enrichment courses unrelated to a degree program)

It is becoming increasingly apparent, at least to us on the campuses, that student attendance patterns now mirror a primary attribute of our society: mobility. We will have many jobs and, for the most part, we will have to move to realize those changes. The same is increasingly true of college/university attendance. Multiple institutional attendances are as prevalent as the single institution attendance pattern. While the increasing complexity of attendance patterns poses grave challenges to system-wide planning, quality assurance and student advisement (Adelman, 1999), it also begs the question of defining institutional effectiveness beyond the successful retention and graduation of first-time, full-time, matriculated undergraduates who enter in the fall semester.

The reporting of retention and graduation rates and concomitant reports that may influence policy focuses on the institution rather than the student. Further, traditional graduation-rate measures only look at a small segment of students in higher education. McCormick (2003) points out that almost half of all students who received a bachelors degree and first enrolled at a four-year institution, attended two or more institutions. Highly mobile, low-income, minority and/or non-traditional students are more likely to swirl and as a result are lost in the retention and graduation counts. (López, Sturtz and Bermúdez, 2005b) Attrition is presented as a negative--the college is not doing its job. Transfer is similarly regarded.

Using the six-year graduation rate for the entering fall cohort as a measure of institutional effectiveness, let alone student success, fails miserably to account for transfer, part-time and stop-out attendance patterns. Some institutions that may be viewed as ineffective by traditional measures actually graduate these 'non-traditional' students in greater numbers than the recognized cohort of first-time, full-time, matriculated undergraduates and are better serving the needs of a broader spectrum of students. (López, Sturtz and Bermúdez, 2005b) "In the country of the second and the third chance, our legislation and our research ask us to hurry up and get it over with and judge both institutions and individuals negatively if they fail to get it over with fast." (Adelman, 1999)

Swirl is also different for different institutional types. The more selective the institution, the less likely their students are to swirl. These are the 'islands' of higher education where students would enter in the traditional fall cohort and not exit until they were ready to graduate--no interruptions or obstacles to impede progress. These types of institutions are usually private or the most prestigious public colleges and universities, generally admit students only in the fall term, have a relatively low percentage of part-time students, have few transfers-in, and have the highest retention and six-year graduation rates.

However, for public institutions, more so for masters-level comprehensive colleges and universities or community colleges than the doctoral "flagships," swirling students represent a larger proportion of the undergraduate student body than the traditional fall cohort. Students enter and they may leave, or take a detour; or they may or may not come back. The truth is, their path through higher education is not linear; nor is it unidimentional.

The major problem moderately selective institutions face is the lack of recognition of the roles they play by state and federal policymakers. According to Pusser and Turner (2004), there is not enough policy energy currently devoted to establishing definitions and goals for student success at those institutions that serve large cohorts of adult, part-time, working and non-traditional students. Transfer students—both leaving and entering—should also be included in this list.

The growth of multi-institutional attendance and discontinuous enrollment poses a challenge to this [linear] approach to college retention (Rab, 2004) and ultimately graduation rates. Among first-time, full-time freshmen, 50 percent will not graduate from their starting institution (Carey, 2004)—but it is not known how many may graduate from another institution to which they may transfer. Transfer students, by definition, will be an attrition statistic from

their starting institutions and, because they are not part of the linear, starting cohort, are not counted when they graduate from their 'adoptive' institution.

Student swirl can be likened to a hurricane, a very powerful force that has both circular and linear movement. It also moves at varying speeds, depending on different conditions. There are three issues in the swirling phenomenon addressed in the case study below; two reflect the circular movement, the third addresses the linear movement:

- Native students—first-time attending an institution of higher education as an undergraduate. Some stay; some leave, never to return; some exhibit discontinuous enrollment at this institution; some leave, go to another institution(s) and come back.

- Transfer students—enter from one or many previous institutions with any number of credits and perhaps, in the case of community college transfers, with an associate's degree in hand: they may stay, they may leave.

- Graduates—time to degree measures student persistence and success; it is a student-centered approach to institutional effectiveness. Rate implies measurement against some standard; it is an institution-centered approach that has a level of failure built-in. It may or may not reflect effectiveness.

The Connecticut State University System[1]: A Case Study

Based on the above discussion of the multi-faceted aspects of student attendance in higher education, the Academic Affairs department at the Connecticut State University System Office (CSU) began a study that has set the basis for a different paradigm of studying student access and success in the system—the swirl in addition to the linear model. I say in addition to because we also recognize that retention and success of the cohort must also be improved.

This new paradigm has three major components: (1) access--new students entering the system, (2) retention and persistence and (3) success--time to degree. There is one additional aspect to swirl that we have also discovered: changing status from full-time to part-time within the same institution. The results of this finding will be discussed under Success—Time to Degree, below.

Access--New Students Entering the System

There are two types of students that enter the CSU system: the first-time student who is new to higher education (hereafter referred to as native) or the transfer student. However, there are over a dozen points of entry to the CSU system: native and transfer students can enter as full-time or part-time, matriculated or non-matriculated—and combinations of both in the fall or

[1] The Connecticut State University System comprises Central, Eastern, Southern, and Western Connecticut State Universities. Each has a Carnegie classification of a public, Masters I, comprehensive institution

spring semester. Except for the first-time, full-time, matriculated student (hereafter referred to as the cohort), none of these other categories is ever counted for persistence or success in the linear model.

This study began in 2004 with the enrollment and persistence of the cohort and transfer students who entered the CSU system in fall 2002. It has now been repeated for the fall 2003 and fall 2004 cohorts. The native students are tracked from the university in the CSU System where they first enrolled. Each fall, a search using the National Student Clearinghouse has been tracking students from each of these groups for subsequent enrollment. For transfers-in, CSU system files will be searched for the last institution of previous enrollment. Theses transfer students will also be tracked each fall for subsequent enrollment and graduation date.

The table and charts below display the different categories of new students who first entered the CSU system over the past four academic years. For the fall semester, the cohort accounts for just over 50% of all new students. [Note: this percentage has been increasing as the number of new, part-time students has been steadily declining over the past four years—see Table 1, below.] When counts for new students in the spring semester are added, their market share of the cohort declines to about 40-42% of all new students; yet this is the only group of students that state and federal reporting agencies and policy makers focus their attention for indicators such as one-year retention rates and six-year graduation rates. It is the only group upon which institutional effectiveness is predicated. The remaining groups, representing almost 60% of all new students, are rarely mentioned in data or media reports.

Table 1: New Students Entering the Connecticut State University System

		2002-2003			2003-2004			2004-05			2005-06		
Fall	**Status**	**FT**	**PT**	**Total**	**FT**	**PT**	**Total**	**FT**	**PT**	**Total**	**FT**	**PT**	**Total**
	Matriculated	***4,340***	120	4,460	***4,071***	83	4,154	***4,272***	108	4,380	***4,291***	127	4,418
Native	Non-Matriculated	15	1,466	1,481	15	1,014	1,029	20	826	846	20	585	605
	Total	4,355	1,586	5,941	4,086	1,097	5,183	4,292	934	5,226	4,311	712	5,023
	Matriculated	1,870	613	2,483	1,958	578	2,536	2,155	595	2,750	2,131	500	2,631
Transfer	Non-Matriculated	5	116	121	4	37	41	9	32	41	6	50	56
	Total	1,875	729	2,604	1,962	615	2,577	2,164	627	2,791	2,137	550	2,687
All New Students		6,230	2,315	8,545	6,048	1,712	7,760	6,456	1,561	8,017	6,448	1,262	7,710
Spring		**FT**	**PT**	**Total**	**FT**	**PT**	**Total**	**FT**	**PT**	**Total**			
	Matriculated	241	62	303	239	37	276	222	42	264			
Native	Non-Matriculated	1	869	870	11	510	521	15	577	592			
	Total	242	931	1,173	250	547	797	237	619	856			
	Matriculated	824	333	1,157	832	337	1,169	961	341	1,302			
Transfer	Non-Matriculated	0	20	20	0	23	23	5	12	17			
	Total	824	353	1,177	832	360	1,192	966	353	1,319			
All New Students		1,066	1,284	2,350	1,082	907	1,989	1,203	972	2,175			
Annual Enrollment		7,296	3,599	10,895	7,130	2,619	9,749	7,659	2,533	10,192			

Chart 1: All New Students: 2004-05 Academic Year

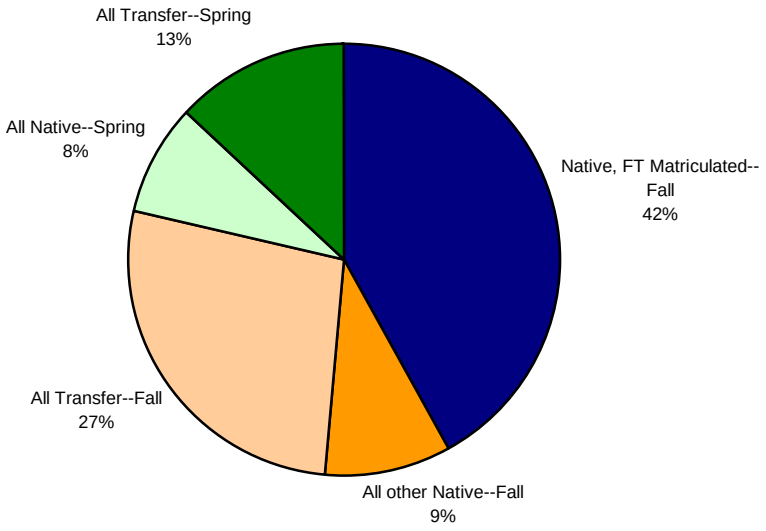
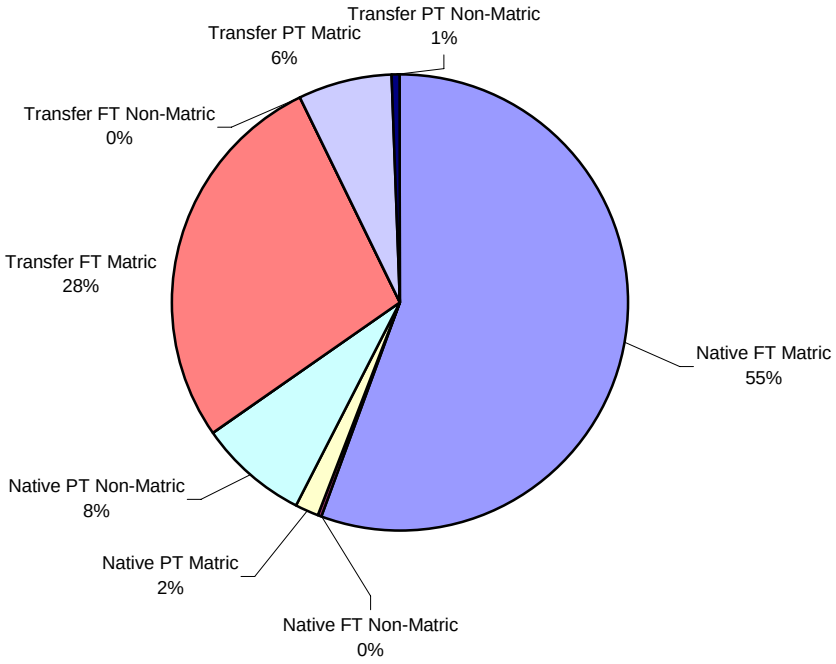


Chart 2: All New Students: Fall 2005



Retention and Persistence

According to a recent study (Rab, 2004), the growth of multi-institutional attendance and discontinuous enrollment poses a challenge to this [linear] approach to college retention and ultimately graduation rates.

Of the 4,340 first-time, full-time, first-year native students enrolled in the four universities of the CSU System in fall 2002, 3,220 (a **retention** rate of 74%) were still enrolled in the fall 2003 semester. Using the National Student Clearinghouse to track enrollment status, an additional 550 were found to have enrolled elsewhere, revising the **persistence** rate to 87%. The remaining 570 students were not enrolled in any of the institutions included in the Clearinghouse's database or their records could not be found. For fall 2004 and fall 2005, this procedure was repeated for the same 2002 cohort to ascertain continued enrollment at their starting CSU institution, to find how many non-returners to that institution were enrolled at another institution, to see if there was yet another 'swirl,' and to find how many left the system. Table 2 displays the distribution of non-returning cohort students.

After three years, 55 percent (2,371 students) were still enrolled at the CSU institution at which they started. In addition, the National Student Clearinghouse found 885 students (20%) from this cohort enrolled at other institutions since they left their CSU institution—a small number are dually enrolled. This raises the three-year retention rate from 55 percent to a three-year persistence rate of 75 percent.

Table 2. Subsequent Enrollment:
Retention and Persistence of the Fall 2002 Native Cohort

	Fall 2003	Fall 2004	Fall 2005
Number Returning to CSU	3,220	2,568	2,371
Retention Rate	74%	59%	55%
Number Enrolled Elsewhere*	550	863*	885*
Persistence Rate	87%	79%	75%
Community College Total	292	323	355
Other CSU	4	158	147
University of Connecticut	58	104	104
CT Independents	20	41	28
Out-of-State Institutions	168	237	251
Percent Attending CT Community College	53%	37%	40%
Percent Attending Out-of-State Institution	31%	27%	28%

* includes students enrolled at native CSU

The most common pattern of persistence was reverse transfer from CSU to a Connecticut community college [see Table 2]. The next most common pattern was students going to out of state institutions.

Of those who transferred out, data returned by the National Student Clearinghouse revealed instances of multiple and concurrent enrollment, with some students attending three, four, even five institutions from the time they left their original CSU institution. Among concurrent enrollees, most attended a four-year institution and a community college.

A similar pattern was noted among the 2,604 students who transferred to CSU in fall 2002. By fall 2004, 1,355 (52%)were still enrolled in their CSU institution. However, even though they were transfers from at least one other institution, CSU was not the final destination for an additional 636 students who left their CSU institution sometime after the fall 2002 semester and enrolled elsewhere. Of the 636, 259 were still enrolled in the fall 2004 semester. This establishes a two-year persistence rate of 62%. This is a similar retention/persistence continuum to the native cohort. Table 3 shows the subsequent enrollment of the transfers-in who transferred out.

Table 3. Subsequent Enrollment:
Retention and Persistence of the Fall 2002 Transfer Cohort

	Cumulative through Fall 2004	Still Enrolled Fall 2004
Number Returning to CSU	1,355	1,355
Retention Rate	52%	52%
Number Enrolled Elsewhere	637	259
Persistence Rate	76%	62%
Community College Total	322	111
Other CSU	61	34
University of Connecticut	53	17
CT Independents	34	20
Out-of-State Institutions	161	77
Blocked Records	24	24
Number attending more than one institution since leaving CSU	98	57
Percent Attending CT Community College	51%	43%
Percent Attending Out-of-State Institution	25%	30%

Success--Time to Degree

Students enter a college or university as either a new or transfer student. Their progress to degree completion can be tracked linearly by cohort, as the National Center for Educational Statistics does in the Graduation Rate Survey, or a graduating class can be divided by term of entry. The first method shows that, among all public four-year institutions, on average, an increasing percentage of those who start will finish in six years from that institution (see Table 4). In 2003-04, among first-time, full-time freshmen, 53% graduated from their starting institution. This method is not easily applicable to transfer students and additional research is planned to analyze the credits accepted at time of transfer and create a graduation-rate paradigm for transfer students. With *Degree Verify* reports from the National Student Clearinghouse, the success of native students, and transfers-in who also transfer out, who may have obtained their degree from another institution can be ascertained, thus improving the graduation (success) rate of the cohort.

Table 4. Mean Six-Year Graduation Rates of Public Four-year Colleges and Universities by Carnegie Institutional Classification

		MEAN SIX-YEAR GRADUATION RATE					
CARNEGIE CLASSIFICIATION	**#**	**1998-99**	**1999-00**	**2000-01**	**2001-02**	**2002-03**	**2003-04**
Public Research/Doctoral Extensive	102	56.5	56.8	58.1	59.3	60.1	63.9
All Public Four-year	**515**	**41.6**	**41.5**	**43.0**	**44.2**	**44.8**	**53.2**
Public Liberal Arts	24	42.3	43.0	44.0	43.9	43.3	43.1
Public Research/Doctoral Intensive	64	40.8	40.8	42.0	43.2	43.7	46.8
Public Masters 1	251	38.0	37.5	39.5	40.5	41.3	44.1
Public Masters 2	24	35.5	35.5	36.4	38.4	39.8	43.5
Public Baccalaureate General	50	30.8	31.4	32.5	34.6	35.4	35.1

The second method, time to degree, can be used for both native and transfer students, thus allowing a comparison between degree recipients and all entering students. For 2003-04 and 2004-05 bachelor degree recipients, 53% started as native students, 47% were transfers. Among the native 2003-04 graduates, 51% entered their CSU institution in fall 1999 or later; 70% of those who entered as transfer students began in that same time frame. Table 5 shows the time-to-degree comparison for the 2003-04 graduating class from the universities in the CSU system.

Table 5. Time to Degree-Bachelor's Degree Recipients: Connecticut State University System

	2003-04			2004-05		
First Term Enrolled	**Native**	**Transfer**	**TOTAL**	**Native**	**Transfer**	**TOTAL**
Less than 4 years ago	18%	57%	37%	18%	48%	32%
4 years ago	39%	19%	30%	41%	19%	31%
5 years ago	22%	9%	16%	23%	11%	17%
6 years ago	7%	5%	6%	7%	7%	7%
7-10 years ago	9%	6%	7%	8%	9%	8%
10 or more years ago	5%	4%	5%	4%	6%	5%
TOTAL GRADUATES	2,070	1,848	3,938	2,166	1,969	4,107
	53%	**47%**		**53%**	**47%**	

The above analyses not withstanding, additional research has revealed that, among those students from each cohort who maintained full-time enrollment status and did not transfer out, 95% graduated within six years. However, this subgroup represented less than 30% of all first-time full-time, full-time students who entered the CSU system in the fall semester.

Fall Cohort	**1995**	**1996**	**1997**	**1998**
FT/FT Bachelor's Degree-seeking Cohort	3,052	3,267	3,619	3,744
Number of Graduates within Six Years	1,194	1,280	1,399	1,453
Six-year Graduation Rate	39.1%	39.2%	38.7%	38.8%
Revised Cohort for continuous, full-time enrollment	806	853	1,017	1,046
Percent of Bachelor's Cohort	26.4%	26.1%	28.1%	27.9%
Number of Graduates within Six Years	776	808	964	993
Revised Six-year rate	96.3%	94.7%	94.8%	94.9%

Conclusions and Recommendations: Towards a New Student Paradigm

The recognition of these emerging patterns of attendance present new challenges for institutions and educational systems. When the undergraduate education of half of all bachelor's degree recipients includes experiences in more than one institutional setting, it is very difficult to judge the educational impact of any single institution. (McCormick, 2003)

Policy-makers must be educated to recognize that non-linear attendance is a legitimate way of experiencing college and meeting educational objectives. New definitions, measures and guidelines are needed to address the realities of higher education's diverse student body and of a modern society that also impact the way students go to college.

Models that presume uninterrupted single-institution attendance are simply inadequate, except perhaps at a small subset of institutions—and these are not the institutions that are the subject of the accountability agenda. (McCormick, 2003) If we are to embrace this new multiple-institution paradigm of student attendance, the way we count, track and measure student

access, progress and success must replace the single focus on first-time, full-time, matriculated students who enter in the fall with the recognition of the success of all classifications of students.

A student swirl model focuses on the student instead of on the institution. Traditional graduation rates are based on a single institution attendance; they assume a linear student movement, they do not measure student swirl and, thus, they are an incomplete measure of institutional effectiveness.

- Student movement through higher education is, in many instances not linear, but multi-dimensional. Students move through two or more institutions while continuing to pursue their educational goals.

- Swirl is not a leakage in the pipeline to educational attainment. It actually promotes access as it provides **many points of entry** along with attendance options to students.

- Student swirl is best measured by annual assessments of access, retention and persistence, and success during the student's academic career and not by a single entering/exit linear approach.
    - Institutions need to expand tracking systems to follow the changing enrollment patterns of native and transfer students: such items as program, credits transferred/accepted and time to degree will become key indicators for student success.

- We need far more nuanced ways to think about student careers and to categorize these complex attendance patterns. We may also need to revise policies and practices in light of these patterns. (McCormick, 2003)
    - Institutional effectiveness measures need to be redefined to include student swirl. Having many points of entry needs recognition as an effective measure of institutional access and of successful transfer and articulation policies.

References

Adelman, C. (1999). *Answers in the Tool Box: Academic Intensity, Attendance Patterns and Bachelors Degree Attainment*. Washington, DC: US Department of Education, Office of Educational Research and Improvement.

Borden, V.M.H. (2004, March/April). Accommodating Student Swirl. *Change Magazine,* pp. 11-17.

Carey, Kevin. (2004). *A Matter of Degrees: Improving Graduation Rates in Four-Year Colleges and Universities*. Washington, DC: The Education Trust.

College Completion: Additional Efforts Could Help Education with Its Completion Goals. (2003, May). Washington, DC: United State General Accounting Office.

López, E., Sturtz A. and Bermúdez, G. (2005b) Addressing the Realities of Student Access and Success: Higher Education as a Multilane Highway. Presentation at the 2005 Annual Conference of the American Association for Higher Education.

McCormick, A.C. (2003). Swirling and Double Dipping: New Patterns of Student Attendance and their Implications for Higher Education in J.E. King, E.L. Anderson and M.E. Corrigan (eds.) *New Directions for Higher Education*: *Number 121*. *Changing Student Attendance Patterns: Challenges for Policy and Practice* (Spring 2003, pp. 13-24). San Francisco: Jossey-Bass.

Pusser, B. and Turner, J.K. (2004, March/April) Student Mobility. *Change Magazine*, pp. 37-43.

Rab, S. (2004, May) *Social Class and the Swirling Student: Exploring the Role of Social Stratification in Postsecondary Pathways*. Paper presented at the 44th Annual Forum of the Association for Institutional Research.

Sturtz, A.J. (2004, November) *Changing Lanes on the Educational Superhighway: A View of Student Swirl.* Proceedings of the 31st annual meeting of the Northeast Association for Institutional Research, Portsmouth, NH, November 2004, 135-142.

Sturtz, A.J. (2005, June) *Toward a New Paradigm of Student Attendance: A View of Student Swirl.* Paper presented at the 45th annual forum of the Association for Institutional Research, San Diego, CA, May 31, 2005.