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AUTHOR Bailey, Brenda L.; Bauman, Curtis; Lata, Kimberly A.
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ABSTRACT

This study used system-wide student satisfaction data from the 14-university Pennsylvania State System of Higher Education (SSHE) to develop a model for predicting student retention, to identify individual students who could be retained with appropriate intervention, and to target factors which may be useful in the intervention process. A student satisfaction survey of 5,558 students was conducted in fall 1996, and this data was linked to fall 1997 enrollment data. Although 87 percent of the freshmen interviewed in the student satisfaction survey indicated plans to reenroll in fall 1997, only 75 percent of these students did in fact persist. Cross-tabulations and chi-square tests found a strong relationship with retention on 40 of the 68 student satisfaction survey questions, and principal component analysis found that 14 of these factors accounted for 56.2 percent of the variance in reenrollment. The five most important factors included major, overall experience, campus community, faculty, and advising. Analysis of variance indicated that although there were no significant differences between persisters and nonpersisters in regard to the first factor, significant differences were found in regard to the remaining four factors. The results are discussed in light of efforts to improve retention on SSHE campuses. The student satisfaction survey questions and a map and list of the campuses comprising the SSHE are appended. (Contains 17 references.) (MDM)

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Brenda L. Bailey, Assistant Director of System Research,
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Curtis Bauman, Director of Institutional Research, East Stroudsburg University

Kimberly A. Lata, Institutional Research Analyst, Shawnee State University

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Introduction

An increasingly important part of institutional accountability is student retention. Although the issue of student retention has been studied extensively, much of the literature is helpful in understanding the problem in general but provides little benefit to individual institutions in improving retention efforts with their own students. Most studies are conducted on unique populations at a single institution, and the results are not generalizable to other institutions. The goal of this study is to utilize system-wide student satisfaction data spanning fourteen universities to begin to develop a model for predicting student retention, to identify individual students who could be retained with appropriate intervention, and to target factors which may be useful in the intervention process.

In recent years many colleges and universities have conducted student satisfaction studies. Research studies found that satisfaction interacts with and is a component of goal commitment, institutional commitment, student integration at both the academic and social levels, student's perceived value of their education, institutional characteristics, and student characteristics (Tinto, 1975, 1982, 1985, 1986, 1987; Metzner & Bean, 1987; Cohen, 1996; Aitken, 1983; Pascarella, Smart, & Ethington, 1986; Cabrera, Castaueda, Nora, & Hengstler, 1992; Getzlaf, Sedlacek, Kearney, & Blackwell, 1984). The specific goals and structure of the studies cited above vary but the motivation for this research rests on the call for greater accountability by colleges and universities that is occurring nationwide.

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Background

Total undergraduate enrollment in Pennsylvania's State System of Higher Education was 82,839 in the semester of the study with undergraduate enrollment on the individual campuses ranging from 1,076 to 12,144 students. This was the first system-wide study of student satisfaction conducted by the State System. A telephone survey of 5,558 undergraduate students was conducted by Millersville University's Center for Opinion Research in fall 1996 to determine student satisfaction with the fourteen comprehensive universities in the State System. A random sample of approximately 400 undergraduate students was interviewed from each university.

This assessment showed that State System students were overwhelmingly satisfied with their experiences with their respective university. More than four out of every five students would attend their university again if they could start college over, and only one in twenty planned to transfer before the following fall. Nine in ten students rated the overall quality of their school either "excellent" or "good". Most said the university they are attending was their top choice. Students believe that the quality of instruction, and the ultimate value of their education, is very good. Most students are also satisfied with the overall quality of life on the State System campuses. Students are satisfied with the quality of advising, although they are least satisfied with the process of registering for classes. Most students believe that their universities are doing an excellent or good job in those areas they consider most important.

Individual student responses were linked with demographic student data maintained on a central database. This allowed for both the analysis of the student satisfaction survey data and for subsequent retention studies. The database includes grade point averages, majors, county of origin, gender, racial/ethnic category, credits toward degree, degrees awarded, enrollment patterns and other descriptive information.

An analysis of the Student Satisfaction Survey data by the Center for Opinion Research shows that very few (5%) State System students planned to transfer before fall 1997, with most students planning to re-enroll (73%) or graduate (20%). Students who intended to transfer had on average fewer credits and spent on average less time involved in university-sponsored activities. These students were also more likely to disagree that they enjoyed being a student at their university.

Statistical Analysis

While the Student Satisfaction Survey project provided valuable information for assessment purposes, the data has numerous other applications including the analysis of student retention and satisfaction. Fall 1997 enrollment data from each of the individual universities was merged with the Student Satisfaction Survey database. Although 87% of freshmen interviewed for this study indicated plans to re-enroll in fall 1997, the actual enrollment data revealed that only 75% of these students did in fact persist. This retention rate is similar to the State System retention rate of 74% for the fall 1996 cohort of first-time, full-time, degree-seeking, baccalaureate freshmen.

Using the merged file of the Student Satisfaction Survey database and the fall 1997 enrollment database, an analysis was completed using the two study groups of persisters and nonpersisters to determine significant differences between the two groups. Excluded from the study were students other than freshmen and those freshmen who indicated plans to graduate before fall 1997. Of the remaining 2,315 freshmen included in the analysis, 590 did not persist to fall 1997 while 1,725 did persist. See table below.

Plans for Fall 1997 * ENRD971 Crosstabulation

Count		ENRD971		Total
		NO	YES	
Plans for Fall 1997	plans to re-enroll	401	1619	2020
	plans to transfer to another college	147	81	228
	DK	42	25	67
Total		590	1725	2315

Using the Statistical Package for the Social Sciences (SPSS), crosstabulations and chi-square tests were run for all 68 questions on the survey. A strong relationship with retention was found on 40 of the Student Satisfaction Survey questions. All questions can be found in the Appendix.

The file was then sorted and split by university to determine if any questions were significant for all 14 universities. The number of students from each university in the analysis ranged from 139 to 207. This attempt to examine questions by university was problematic. If certain assumptions are not met, the significance level can be distorted or misleading. It is recommended that no cell have an expected value less than 1 and not more than 20% of the cells have expected values less than 5. These guidelines were violated when crosstabulations were split by university and no further analysis was made at the university level. A solution would have been to combine cells into fewer categories, but this option was not examined at this time. The following table shows the number of students from each university in the State System included in this study.

Freshmen by University

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bloomsburg	182	7.9	7.9	7.9
	California	156	6.7	6.7	14.6
	Cheyney	165	7.1	7.1	21.7
	East Stroudsburg	172	7.4	7.4	29.2
	Edinboro	155	6.7	6.7	35.9
	Kutztown	143	6.2	6.2	42.0
	Lock Haven	169	7.3	7.3	49.3
	Mansfield	151	6.5	6.5	55.9
	Millersville	159	6.9	6.9	62.7
	Shippensburg	194	8.4	8.4	71.1
	Slippery Rock	139	6.0	6.0	77.1
	West Chester	157	6.8	6.8	83.9
	Indiana	207	8.9	8.9	92.8
	Clarion	166	7.2	7.2	100.0
	Total	2315	100.0	100.0	
Total		2315	100.0		

Factor analysis is a statistical tool which can be used to identify a small number of factors which represent relationships among many interrelated questions in a survey. Factor analysis extracts as many significant factors from the data as possible. A large number of variables can then be reduced to a more manageable number of factors. Using SPSS, data reduction was performed with a factor analysis to find inter-relationships among the 68 questions and to organize groups of questions into factors based on those relationships. Factor analysis using a varimax rotation was conducted. Varimax rotation is generally the most commonly used in institutional research. Only those questions using a Likert response scale were included in the analysis. To determine the dependent variables constituting a factor, factor loadings were computed. By convention, those questions failing to load .40 or above on any factor were not included in the computation of the scores.

A principal components analysis showed 14 factors with eigenvalues greater than one. The strength of a factor is indicated by its eigenvalue. These 14 factors accounted for 56.2% of the variance. Typically, the first two or three factors are the strongest, accounting for the most variance. The first five factors are shown in the following tables: major, overall experience, campus community, faculty, and advising.

The first factor focuses on the quality and content of major courses. The second factor addresses the overall experience of being a student at the university. The third factor deals with the campus community and includes issues such as a sense of community and belonging, campus activities and safety. The fourth factor focuses on faculty interaction with students. The fifth factor includes interest and availability of advisors.

Factor 1 Major	Factor Loading
Q29. The quality of major courses	.88
Q27. Quality of instruction in major	.88
Q52. The instruction in my major is excellent	.88
Q51. The content major courses will help in my career	.82

Factor 2 Overall Experience	Factor Loading
Q55. I enjoy being a student at university	.68
Q4. Would still attend if starting over	.67
Q35. Overall satisfaction with university	-.62
Q41. Overall college experience	.59
Q9. Overall quality of university	.54
Q37. Overall quality of instruction	.42

Factor 3 Campus Community	Factor Loading
Q38. Sense of community on campus	.66
Q25. How well university provides a safe campus environment	.64
Q26. How well university provides campus activities	.63
Q62. Incidents of racial prejudice seldom occur on campus	.59
Q48. Most students feel a sense of belonging	.59
Q61. I feel free from harassment on campus	.45

Factor 4 Faculty	Factor Loading
Q54. Faculty are fair and unbiased	.67
Q47. University staff is helpful	.64
Q57. Faculty are available when I need them	.56
Q56. Quality of instruction in most classes is excellent	.52
Q49. Faculty care about me	.50

Factor 5 Advising	Factor Loading
Q50. My advisor is interested in my progress	.85
Q46. My advisor is available when needed	.84
Q34. Providing an academic advisor interested in your progress	.81

Factor analysis identifies factors based on the responses, but does not attempt to determine differences in responses in any known groups within the data, such as persisters and nonpersisters. An analysis of variance was completed

with an Anova Table for these five factors to determine if there were significant differences between persisters and nonpersisters. The first factor (major) showed no significant difference between these two groups. However, there were significant differences on the remaining four factors (overall experience, campus community, faculty, and advising) at the .05 level.

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Major	Between	(Combined)	.581	1	.581	.581	.446
	Within Groups		2302.419	2302	1.000		
	Total		2303.000	2303			
Overall Experience	Between	(Combined)	75.694	1	75.694	78.232	.000
	Within Groups		2227.306	2302	.968		
	Total		2303.000	2303			
Campus Community	Between	(Combined)	27.012	1	27.012	27.321	.000
	Within Groups		2275.988	2302	.989		
	Total		2303.000	2303			
Faculty	Between	(Combined)	5.960	1	5.960	5.973	.015
	Within Groups		2297.040	2302	.998		
	Total		2303.000	2303			
Advising	Between	(Combined)	9.110	1	9.110	9.142	.003
	Within Groups		2293.890	2302	.996		
	Total		2303.000	2303			

Implications

The goals of this study were to begin the development of a model which would predict attrition, identify individual students who could be retained with appropriate intervention, and target factors that may be useful in the intervention process.

There were significant differences in student satisfaction ratings between persisters and nonpersisters. Can these differences be utilized to identify students at risk of leaving the university so as to target them for intervention? This study

did identify which specific questions in these satisfaction ratings were most highly correlated with retention. Although causality is not assumed in such linkages, individual students could be targeted for intervention designed to enhance retention based upon their responses to these specific questions. In addition, those factors accounting for the most variance could also be targeted for use in the intervention process and in enrollment management planning. For example, campus community, faculty, and advising factors were significantly different for persisters and nonpersisters and could be incorporated into intervention strategies.

Next Steps

The model presented here should be considered just one step in the evolution of a predictive model for this particular system of universities. While these findings are consistent with prior research, no single model can be expected to relate to all institutions of higher education.

One limitation of this model is that no attempt was made to exclude involuntary dropouts. Part-time and full-time students were included as were students not yet enrolled in a degree program and transfer students. In fact, all students included in the Student Satisfaction Survey were initially included in this study. Even though the retention rate of this group of freshmen is similar to the State System retention rate of first-time, full-time, degree-seeking, baccalaureate freshmen, a next step could be to examine only those students who were identified as full-time, first-time, baccalaureate program students.

This was the first system-wide study of student satisfaction conducted by the State System and the first time such data was available for an analysis of student retention and satisfaction. Not only do the findings shown here validate prior research, the findings also serve to validate efforts on individual State System campuses to improve retention. For example, one university has made committed efforts to foster a sense of community on campus. This study did identify significant differences between persisters and nonpersisters in the factor campus community. In addition to validating current efforts on campus, the findings shown here can also be used to provide direction for future efforts. The next step is to share these findings with the individual State System campuses. This is just the beginning.

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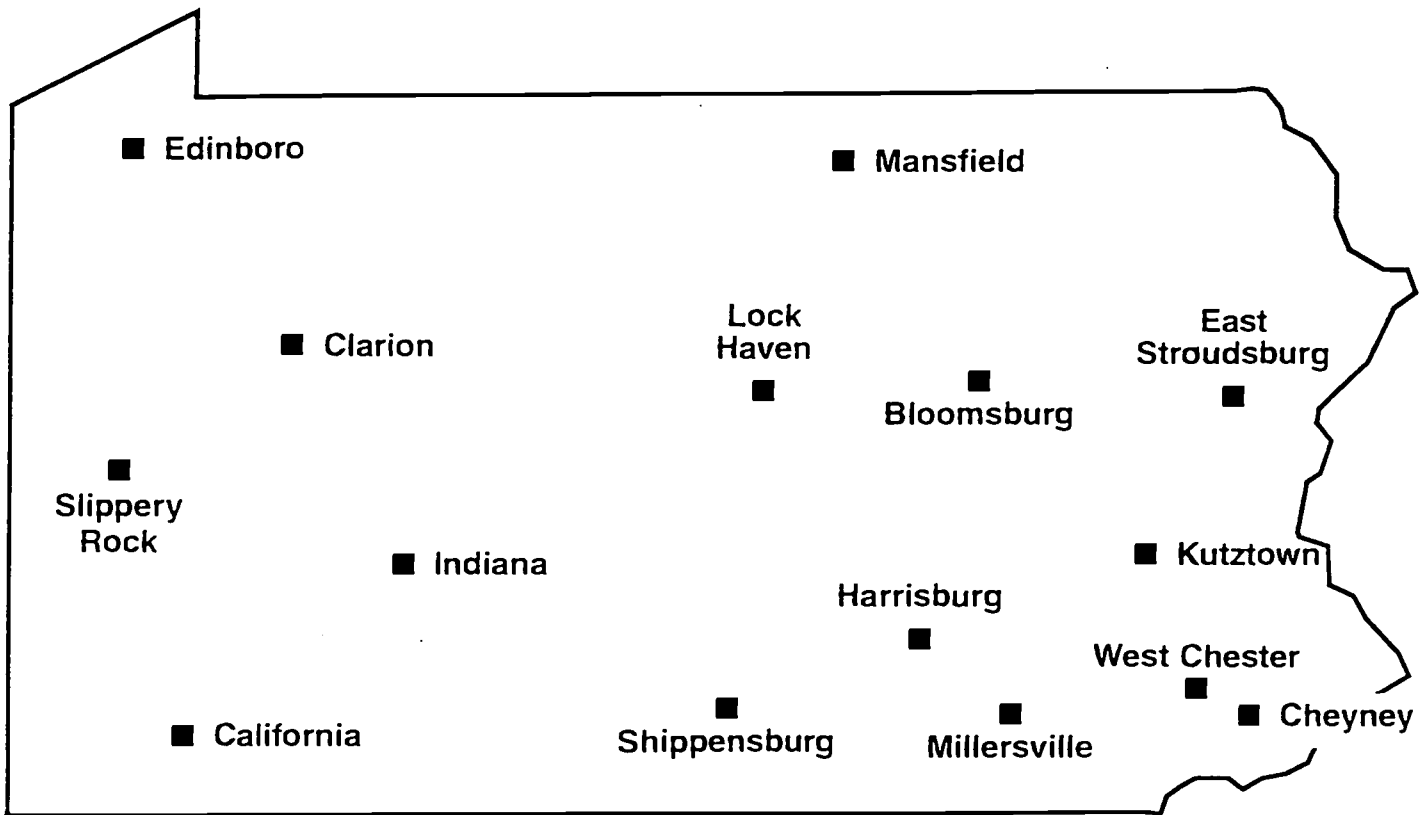
Appendix

Student Satisfaction Survey Questions	Significant at $p < .05$
Q1. Main reason for pursuing a college education	
Q2. Was university top college choice	X
Q3. Main reason for attending	
Q4. Would still attend if starting over	X
Q5. Why would respondent choose university again	
Q6. Why would respondent not attend university again	
Q7. Plans for fall 1997	X
Q8. Reasons for transferring	
Q9. Overall quality of university	X
Q10. Reasons for overall quality	
Q11. Is university teaching important things	X
Q12. Used Career Services Center	
Q13. Ever used Counseling Center	
Q14. Ever used Student Health Center	
Q15. Importance of preparing people for careers	
Q16. Importance of providing general education programs	
Q17. Importance of preparing people for graduate school	
Q18. Importance of providing an affordable education	
Q19. Importance of providing a safe campus environment	
Q20. Importance of providing on-campus activities	
Q21. University prepares people for careers	X
Q22. How well university provides general education programs	X
Q23. University prepares people for graduate school	X
Q24. How well university provides an affordable education	X
Q25. How well university provides a safe campus environment	X
Q26. How well university provides campus activities	X
Q27. Quality of instruction in major	X
Q28. Providing a wide range of courses	X
Q29. The quality of major courses	X
Q30. The value of general education courses	X
Q31. Having classes available when needed	
Q32. Providing knowledgeable faculty	X
Q33. Being concerned for you as an individual	X
Q34. Providing an academic advisor interested in your progress	X

Q35. Overall satisfaction with university	X
Q36. What could university do to make you more satisfied	
Q37. Overall quality of instruction	X
Q38. Sense of community on campus	X
Q39. The amount of contact with faculty	X
Q40. Satisfaction with class sizes	X
Q41. Overall college experience	X
Q42. Registering for classes is easy	
Q43. Can get classes in proper sequence	
Q44. University offers highest quality education	X
Q45. Most faculty respect students	X
Q46. My advisor is available when needed	
Q47. University staff is helpful	X
Q48. Most students feel a sense of belonging	X
Q49. Faculty care about me	X
Q50. My advisor is interested in my progress	X
Q51. The content major courses will help in my career	X
Q52. The instruction in my major is excellent	X
Q53. Student services are available at convenient times	X
Q54. Faculty are fair and unbiased	
Q55. I enjoy being a student at university	X
Q56. Quality of instruction in most classes is excellent	X
Q57. Faculty are available when I need them	
Q58. Tuition is a worthwhile investment	X
Q59. There is a wide range of courses offered on campus	X
Q60. Considering the costs and quality, university is a good value	X
Q61. I feel free from harassment on campus	X
Q62. Incidents of racial prejudice seldom occur on campus	
Q63. I have associated with persons from backgrounds different than mine	X
Q64. Hours per week spent studying	
Q65. Hours per week spent talking to other students about class	
Q66. Hours per week spent in a paid job	
Q68. Number of times during semester had conversation with faculty	

State System of Higher Education

Commonwealth of Pennsylvania



Bloomsburg University of Pennsylvania
Bloomsburg, PA 17815
(717) 389-4000

Kutztown University of Pennsylvania
Kutztown, PA 19530
(610) 683-4000

California University of Pennsylvania
California, PA 15419
(724) 938-4000

Lock Haven University of Pennsylvania
Lock Haven, PA 17745
(717) 893-2011

Cheyney University of Pennsylvania
Cheyney, PA 19319
(610) 399-2000

Mansfield University of Pennsylvania
Mansfield, PA 16933
(717) 662-4000

Clarion University of Pennsylvania
Clarion, PA 16214
(814) 226-2000

Millersville University of Pennsylvania
Millersville, PA 17551
(717) 872-3024

East Stroudsburg University of Pennsylvania
East Stroudsburg, PA 18301
(717) 422-3211

Shippensburg University of Pennsylvania
Shippensburg, PA 17257
(717) 532-9121

Edinboro University of Pennsylvania
Edinboro, PA 16444
(814) 732-2000

Slippery Rock University of Pennsylvania
Slippery Rock, PA 16057
(724) 738-0512

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Indiana, PA 15705
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West Chester, PA 19383
(610) 436-1000



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