

AN ANALYTIC STUDY OF FIRST YEAR STUDENT RETENTION AT BGSU, SPRING 2001

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ABSTRACT

This report describes the results of an analytic study of the factors related to the retention of Fall 1999 BGSU main campus first year students to Fall 2000. A path analytic approach was employed to explore the effects of a variety of demographic, college environment and perception variables upon retention. The results showed that 1) student satisfaction; 2) students reporting that BGSU emphasizes academic and social engagement, and provides a supportive learning environment; 3) students reporting that they less often wrote papers of fewer than twenty pages in their classes; 4) student involvement in the college activities listed in the National Survey of Student Engagement; 5) student satisfaction with living arrangements; and 6) high school grade point averages were the strongest predictors of retention.

BACKGROUND AND METHODOLOGY

Improving student retention is one of the most important ongoing challenges facing Bowling Green State University. The percentage of new first year students entering the main campus in the Fall term of 1999 who returned for the Fall 2000 (78.0%) has improved from the low point of 75.5% in 1995-96, but remains considerably lower than the high point of 82.2% in 1986-87. In addition to altruistic reasons for wishing to improve the experiences of our students, financial concerns also force us to seek to improve retention; calculations have shown that for every 100 students who do not return to BGSU between their first and second years, the University loses \$1 million per year. Given a projected constant number of high school graduates across the state for the next several years, increased competition for students among higher education institutions, and Ohio's historically low rate of subsidization for its public colleges and universities, improving student retention remains one of our few viable options for improving revenue. Developing an improved understanding of the reasons why some students re-enroll and others do not is a key goal for the University and for the Office of Institutional Research in particular.

It is important to note that about 56% of the Fall 1999 full-time main campus first year students who did not re-enroll for Fall 2000 (i.e., over 400 students) had cumulative grade point averages above 2.00 and were in good academic standing. These students made a deliberate decision to leave Bowling Green State University. A better understanding of the reasons behind students' departure decisions would help to inform planning and policy formation.

Both conceptual and operational reasons exist for adopting a complex analytical approach to the study of student retention (i.e., for not simply surveying or interviewing students who do not re-enroll). A solid body of literature has demonstrated that student withdrawal from college is a dynamic process which involves numerous interactions between students and their institutions

over time. Multifaceted data collection and multivariate statistical analysis are necessary to adequately gauge retention/attrition. Secondly, single point of contact surveys and interviews (even if they ask the right questions in the right ways) are problematic because it is difficult to reach students who are no longer enrolled and to motivate them to respond to surveys and interviews.

Alexander Astin (1991) provides a framework for assessing effects upon a variety of college student outcomes. His I-E-O theory posits that student outcomes are jointly influenced by inputs (i.e., student background characteristics) and college environments (e.g., students' participation in various programs, enrollment in specific colleges, perceptions, in-class and out-of-class activities, etc.). This somewhat general assessment approach lends itself to a variety of research studies. Some more specific and very useful perspectives for understanding the process of students' voluntary departure from higher education have been developed over the past several years. Vincent Tinto's (1975, 1987) theory of individual student departure from higher education has been identified as the most mature among these by Braxton, Sullivan, and Johnson (1997), who provide the following description of the central tenets of Tinto's theory.

Characteristic of [Tinto's] perspective is the view [that] student departure is a consequence of the interaction between the individual student and the college or university as an organization. Important to such interactions is the meaning the individual student ascribes to [his or her] relationship with the formal and informal dimensions of the collegiate organization. (p. 108).

Pascarella and Terenzini (1983) provide the following further explanation of Tinto's theory:

Students come to a particular institution with a range of background traits (e.g., race, secondary school experiences, academic aptitude, family background). These lead to initial commitments, both to the institution attended and to the goal of graduation from college. Together with background traits, these commitments influence not only how well the student will perform in college but also how he or she will interact with, and subsequently become integrated into, the institution's social and academic systems. Other things being equal, the greater the individual's level of social and academic integration, the greater his or her subsequent commitment to the institution and commitment to the goal of college graduation, respectively. In turn, these commitments are seen, along with levels of integration, as having a direct, positive influence on retention. (p. 215).

Braxton, Sullivan, and Johnson's (1997) assessment of empirical support for Tinto's interactionist theory of college student departure concluded that only five of Tinto's thirteen hypothesized structural relationships seem to be supported at residential universities. Tinto's theory remains an important tool for providing perspectives on factors affecting college student departure in general, but institutional research studies which pay particular attention to hypothesized effects upon student departure which are of particular interest at the individual college or university level remain necessary for providing a richer and more informative understanding of retention/attrition within those specific settings.

With these ideas in mind, the Office of Institutional Research used Astin's and Tinto's theories as a framework for an initial analytic study of influences upon student retention at BGSU in 1997. The results showed that students who were more committed to graduating from BGSU; who were more satisfied; who reported more positive interactions with faculty, staff, fellow students, and the community; who were more likely to perceive that BGSU emphasizes educational and personal growth and to report that they had experienced such growth; and who had higher freshman year grades and ACT scores were more likely to re-enroll. The study was initial in the sense that many of the data elements (e.g., students' parents' education and income levels, pre-college expectations, etc.) which could be helpful for the study were not available at

the time this study was carried out. The Office of Institutional Research has since developed systematic data collection tools which allows these elements to be available for such analyses.

Given the availability of additional data as well as new questions about the effects of student participation in a variety of newly developed first year student programs upon retention, the Office of Institutional Research decided to update the 1997 study to provide a more comprehensive analysis of effects upon the retention of first year, full-time, main campus students to the following year. The results of the BGSU First Year Student Questionnaire (FYSQ, BGSU Office of Institutional Research, 1999) provide data to the current analytic study on students' parents' education and income levels, pre-college expectations, etc. The results of the BGSU New Student Transition Questionnaire (NSTQ, BGSU Office of Institutional Research, 1999) provide data upon how well these students are becoming acclimated to college life within their first two months at the University. The results of the National Survey of Student Engagement (NSSE, BGSU Office of Institutional Research, 2000) provide data upon first year students' college activities, opinions about their institution, and their learning and personal development as the outcomes of their college education.

Data for the current study were obtained from the BGSU Student Flow Model, the results of the three questionnaires noted above, and databases maintained by the Office of Institutional Research concerning first year students' participation in various first year programs. The study population was all new first year, full-time, degree seeking main campus students in Fall 1999 (N=3,516). Due to the fact that Tinto's theory concerns students' voluntary withdrawal, students who were academically suspended or dismissed following Spring 2000 (N=235) were eliminated from the data set. Among the remaining students, 2,677 (82%) re-enrolled for Fall 2000 and 604 (18%) did not. It should be noted that a full set of questionnaire responses was not available for all students in the study population; First Year Student Questionnaire responses were available for 2,646 (81%) of the population; New Student Transition Questionnaire responses were available for 1,261 (38%); and National Survey of Student Engagement responses were available for 209 (6%). Demographic characteristics of the population are available from the Student Flow Model (BGSU Office of Institutional Research, 1999). Specific data elements used in the study are listed below.

Variables Used in the Study

Student Background

from Student Flow Model:

ACT Composite Score (mean 21.9, SD 3.6)
Race/Ethnicity (student of color=1, White=0)
Gender (female=1, male=0)
High School GPA (mean 3.17, SD 0.49)

from First Year Student Questionnaire:

Father' Education Level (1-8 scale)
Mother' Education Level (1-8 scale)
Parental Income (1-5 scale)

Student Pre-College Perceptions

from First Year Student Questionnaire:

Highest Degree Planned Anywhere (1-6 scale)
Highest Degree Planned at BGSU (1-6 scale)
Among Colleges to Attend Is BGSU Your (First Choice, Second Choice, Less Than Second Choice)

How Concerned Are You About Your Ability to Finance Your College Education (1-3 scale)
What is your estimate of the chances that you will . . . (22 4-point scale items such as Change Your Major, Drop Out)
How important are each of the following to you? . . . (19 4-point scale items such as Being Very Well Off Financially)

College Experiences

from the Student Flow Model and first year program participant lists:

College First Semester (dummy coded (1 or 0) into 7 variables)
Credit Hours Enrolled 15th Day First Semester
Art Freshman Interest Group Participant (dummy coded 1 or 0)
BG Effect Participant (dummy coded 1 or 0)
Chapman Learning Community Participant (dummy coded 1 or 0)
Freshman Interest Groups Participant (dummy coded 1 or 0)
Honors Program Participant (dummy coded 1 or 0)
Health Sciences Residential Community Participant (dummy coded 1 or 0)
President' Leadership Academy Participant (dummy coded 1 or 0)
Springboard Program Participant (dummy coded 1 or 0)
UNIV 100 Participant (dummy coded 1 or 0)
UNIV 131 Participant (dummy coded 1 or 0)
University Program for Academic Success Participant (dummy coded 1 or 0)

Transition to College Perceptions

from the New Student Transition Questionnaire:

21 5-point scale items grouped into 5 scales:
Academic Adjustment (3 items, reliability=.75)
Academic Involvement (2 items, reliability=.21)
Satisfaction with Faculty (2 items, reliability=.37)
Satisfaction with Living Arrangements (2 items, reliability=.48)
Social Adjustment (7 items, reliability=.80)
University Involvement (2 items, reliability=.37)

Academic Engagement Perceptions

from the National Survey of Student Engagement:

College Activities (14 items, reliability=.74)
Institutional Emphasis (5 items, reliability=.79)
Educational and Personal Gains (12 items, reliability=.83)
Relationships with Other Students, Faculty, Administrative Offices (3 items, reliability=.58)
Satisfied with Educational Experience and Would Return Again (2 items, reliability=.75)
Number of Assigned Books Read Last Year
Number of Own Books Read Last Year
Number of Written Papers of 20 Pages or More
Number of Written Papers of Fewer Than 20 Pages
Type of Exams Taken (7-point scale ranging from mostly multiple choice to mostly essay)
Coursework Emphasizes Memorization (4-point scale)
Coursework Emphasizes Analysis (4-point scale)
Coursework Emphasizes Synthesis (4-point scale)
Coursework Emphasizes Making Judgments (4-point scale)
Coursework Emphasizes Application (4-point scale)
Hours/Week Spent Preparing for Class (7-point scale)
Hours/Week Spent Working On Campus (7-point scale)
Hours/Week Spent Working Off Campus (7-point scale)

Hours/Week Spent Participating in Co-Curricular Activities (7-point scale)
Hours/Week Spent Relaxing and Socializing (7-point scale)
Hours/Week Spent Caring for Dependents (7-point scale)
Completed/Plan a Practicum/Internship/Co-Op (3-point scale)
Completed/Plan Community Service/Volunteer Work (3-point scale)
Completed/Plan Interdisciplinary Coursework (3-point scale)
Completed/Plan Foreign Language Coursework (3-point scale)
Completed/Plan Study Abroad (3-point scale)
Completed/Plan Independent Study (3-point scale)
Completed/Plan a Culminating Senior Experience (3-point scale)

Retained for Fall 2000

from the Student Flow Model: Retained Fall 2000 (dummy coded 1 or 0)

A path analysis was performed using the variables listed above. As suggested by Astin's and Tinto's work, the studies cited by Braxton, Sullivan, and Johnson (1997), and procedures discussed by Knight and Coperthwaite (2000), the influence of each of the variables in the categories listed above upon the variables in the categories which follow them on the list was tested. For example, student background characteristics were hypothesized to influence pre-college perceptions, college experiences, transition to college perceptions, academic engagement perceptions, and retention, while academic engagement perceptions were hypothesized to influence only retention. Path analysis was used to determine statistically significant direct effects in the research model and to gauge its overall efficacy in predicting student retention. An initial path analysis was carried out using all of the variables listed above. Following this, non-statistically significant (at $p < .05$) influences were deleted from the path model. The subsequent final or 'rimmed' path model is shown below with effect sizes and error terms omitted for clarity.

RESULTS

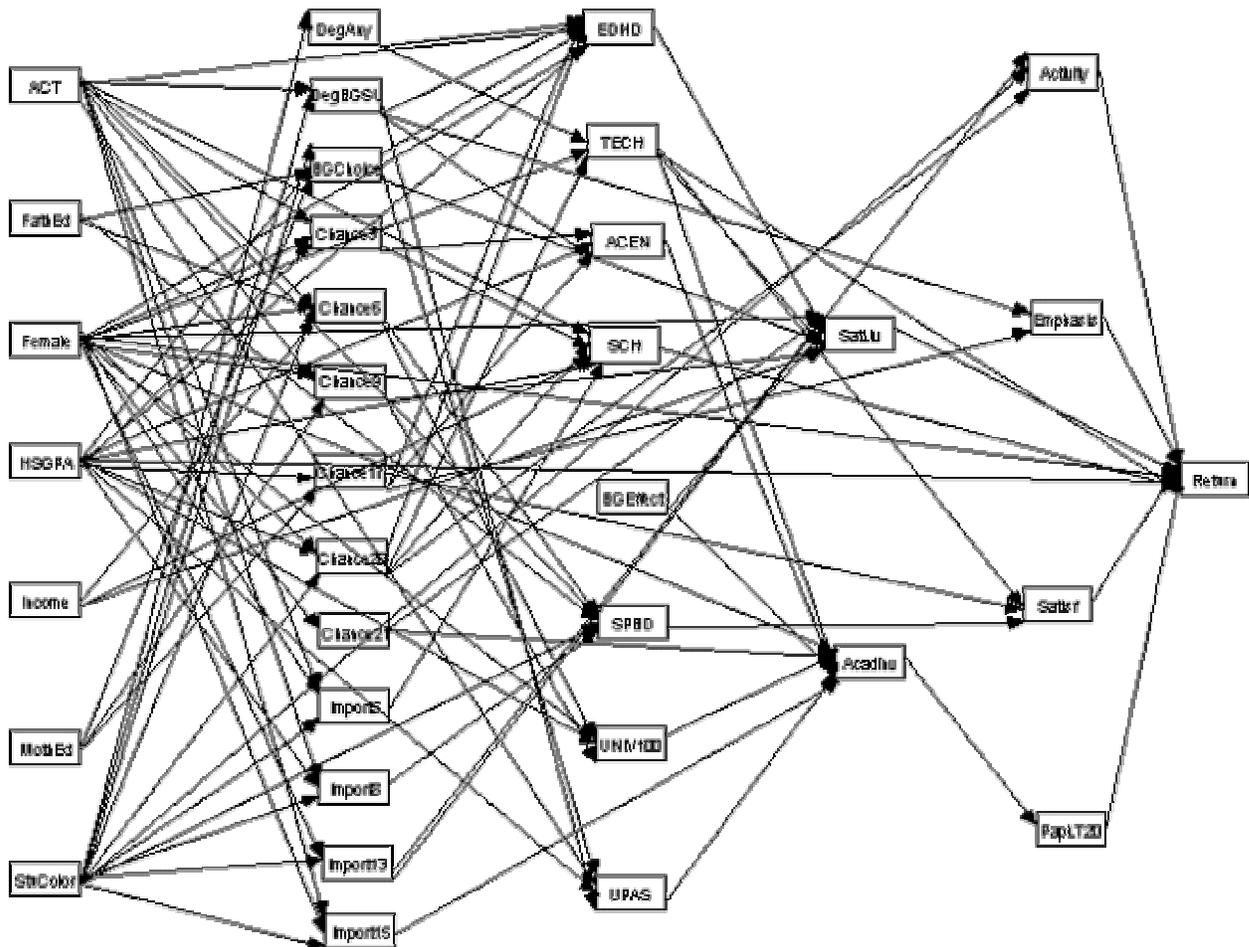
The overall goodness-of-fit of the path model to the data was judged to be appropriate since the ratio of the model's Chi-square statistic to its degrees of freedom was lower than 5:1 (it was 2.2:1) and since values for the Bentler-Bonett Normed Fit Index, Bentler's Comparative Fit Index, Bollen's Relative Fit Index, Bollen's Incremental Fit Index, and the Tucker-Lewis coefficient were all greater than 0.90; these guidelines are offered by Arbuckle & Wothke (1999) to assess the overall adequacy of path models.

The path model explained 33% of the variance in freshman retention. A rank ordered table of significant direct, indirect, and total effects of each of the variables in the study upon retention is provided below. Since standardized effects are shown, they are directly comparable (e.g., an effect of .502 is more than three and one half times as strong as an effect of .141). Six of the effects upon retention can be classified as moderate to weak and were primarily direct. The remainder of the effects, although significant, were very weak and were almost all indirect only.

Standardized Effects of Study Variables Upon Student Retention

Independent Variables	Direct Effect	Indirect Effect	Total Effect	Rank Order
Satisfaction (NSSE Scale)	.502		.502	1
Institutional Emphasis (NSSE Scale)	-.244		-.244	2
Number of Written Papers of Fewer Than 20 Pages (NSSE Item)	-.203		-.203	3
College Activities (NSSE Scale)	.180		.180	4
Satisfaction with Living Arrangements (NSTQ Scale)	.153		.153	5
High School GPA	.113	.028	.141	6
Student Credit Hours Registered for First Semester	.089		.089	7
Chance of Transferring (FYSQ Item "Chance17")		.084	.084	8
Gender (Female)	-.072	.016	-.056	9
Highest Degree Planned at BGSU (FYSQ Item "DegBGSU")		-.040	-.040	10
Springboard Program Participant		.040	.040	10
Academic Involvement (NSTQ Scale)		-.039	-.039	11
Chance of Participating in Volunteer/Community Service (FYSQ Item "Chance20")		-.035	-.035	12
Race/Ethnicity (Student of Color)		.034	.034	13
Parents' Income (FYSQ Item)		.022	.022	14
Importance of Keeping Up to Date With Political Affairs (FYSQ Item "Import13")		-.015	-.015	15
BG Effect Program Participant		-.014	-.014	16
Chance of Finding a Job in My Major After Graduation (FYSQ Item "Chance21")		-.013	-.013	17
College: Academic Enhancement		-.013	-.013	17
College: Education and Human Development		.013	.013	17
Chance of Playing Intercollegiate Athletics (FYSQ Item "Chance9")		-.013	-.013	17
Was BGSU your 1st, 2nd, etc, choice of universities? (FYSQ Item "BGChoice")		-.010	-.010	18
College: Technology	-.070	.080	.010	18
University Program for Academic Success Participant		.007	.007	19
Chance of Failing One/More Classes (FYSQ Item "Chance3")		.006	.006	20
Mother's Education Level (FYSQ Item)		-.005	-.005	21
Importance of Being Well Off Financially (FYSQ Item "Import5")		.005	.005	21
ACT Composite Score		.003	.003	22
Highest Degree Planned at Institution (FYSQ Item "DegAny")		-.003	-.003	22
Importance of Becoming Accomplished in the Arts (FYSQ Item "Import15")		.003	.003	22
UNIV 100 Class Participant		-.002	-.002	23
Chances of Getting a Job to Help Pay for College (FYSQ Item "Chance6")		.002	.002	23
Importance of Writing Original Works (FYSQ Item "Import8")		.002	.002	23
Father's Education Level (FYSQ Item)		.001	.001	24

Trimmed Path Model



SUMMARY AND CONCLUSIONS

The fact that research model explained 33% of the variance in student retention represents a desirable outcome in applied educational research and this result compares favorably with those of similar published academic studies (e.g., Pascarella & Chapman, 1983 [15%]; Pascarella & Terenzini, 1983 [18%]). The results generally confirm Tinto's contention that students' academic and social integration into college life have a stronger effect upon voluntary student retention than does their pre-college academic ability.

The strongest predictors of retention were found to be 1) student satisfaction; 2) students reporting that BGSU emphasizes academic and social engagement, and provides a supportive learning environment (the negative sign of the effect in the table of results is a function of the direction of the scale in the NSSE; the relationship is a positive one); 3) students reporting that they less often wrote papers of fewer than twenty pages in their classes; 4) student involvement in the college activities listed in the National Survey of Student Engagement; 5) student satisfaction with living arrangements; and 6) high school grade point average.

It is also important to note the study variables which did not show significant effects upon retention. These included most of the student-estimated chances of various college outcomes

and estimates of the importance of various personal goals listed on the BGSU First Year Student Questionnaire; membership in the colleges of Arts and Sciences, Business Administration, Health and Human Services, and Musical Arts; participation in the Chapman Learning Community, the Freshman Interest Groups, the Health Sciences Residential Community, the Honors Program, the President's Leadership Academy, and the UNIV 131 class; three of the scales formed from the results of the New Student Transition Questionnaire; and many of the variables from the National Survey of Student Engagement, such as educational and personal gains, relationships with faculty, staff, and other students, students' reading, writing, and examination activities, hours per week spent at various activities, and completion of various academic enrichment activities.

Two limitations must be acknowledged for the current study. These include the fact that not all students in the study population had survey results available and also the low reliabilities of the two scales formed from the results of the New Student Transition Questionnaire which were found to be significant predictors of retention.

The implications for practice and policy of this study for Bowling Green State University are that educationally purposeful activities that can enhance student satisfaction; provision of classroom and co-curricular activities which emphasize active learning, constructive engagement, and meaningful student-faculty and student-student interaction; continued attention to students' satisfaction with living arrangements; and continued emphasis upon the enrollment of academically well prepared students will all act to improve student retention. The finding that students who less often write papers of fewer than twenty pages in their classes were more well retained is both unexpected and counter-intuitive and invites further research. Exploration of influences upon satisfaction and upon provision of engaging academic and social college environments (which, in turn, most greatly affect retention) is hampered by the fact that the research model does a poor job of accounting for the variance in these factors. Nevertheless, Astin's (1993) research suggests that providing a sense of community on campus and facilitating meaningful student-faculty and student-student interaction are among the greatest influences upon student satisfaction. Kuh and his colleagues in their (1991) *Involving Colleges* study identified a number of practices to promote engaging learning activities on campus. Finally, Tinto (1987, pp. 138-140) suggests six principles of institutional action regarding student retention, all of which are validated by the current study:

1. Institutions should ensure that new students enter with or have the opportunity to acquire the skills needed for academic success.
2. Institutions should reach out to make personal contact with students beyond the formal domains of academic life.
3. Institutional retention actions should be systematic in character.
4. Institutions should start as early as possible to retain students.
5. The primary commitment of institutions should be to their students.
6. Education, not retention, should be the goal of institutional retention programs.

The Office of Institutional Research will continue to collect a variety of data on practices, policies, and perceptions which may affect student retention and will periodically update analytic studies such as this one. The office welcomes and invites comments and suggestions.

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