DOCUMENT RESUME

ED 445 652 HE 033 342

AUTHOR	Volkwein, J. Fredericks; Valle, Sondra; Parmley, Kelli; Blose, Gary; Zhou, Ying
TITLE	A Multi-Campus Study of Academic Performance and Cognitive Growth among Native Freshman, Two-Year Transfers, and Four-Year Transfers. AIR 2000 Annual Forum Paper.
PUB DATE	2000-05-00
NOTE	24p.; Paper presented at the Annual Forum of the Association for Institutional Research (40th, Cincinnati, OH, May 21-23, 2000).
PUB TYPE	Guides - Non-Classroom (055) -- Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Achievement; Academic Records; Bachelors Degrees; *Cognitive Development; *College Graduates; *Evaluation Criteria; Grades (Scholastic); Higher Education; Nongraded Student Evaluation; *Outcomes of Education; Performance Factors; Predictor Variables; *Student Characteristics; Student Evaluation
IDENTIFIERS	*AIR Forum

ABSTRACT

This study examined factors that affect student learning and growth in four student populations: seniors who began as freshmen immediately after high school, students who transferred from two-year colleges, students who transferred from four-year colleges, and students who entered Bachelor of Arts programs after military service or work. The data examined 2,500 graduating seniors at 20 state colleges and universities in 1997; data was broken down into four categories: background and demographic information, including age; class year; sex; ethnicity; employment; major; financial aid; residence; admissions test scores; high school grades and class rank; student plans, goals, and reasons for attending; level of student satisfaction with campus services and facilities, as well as campus academic environment; and cognitive and noncognitive experiences and outcomes, including classroom experiences and self-reported growth. Results indicate that the best academic outcomes were among the group who enter Bachelor of Arts programs after work or military experience. Differences in outcomes between the two transfer populations were not significant. For all students the best predictor of cumulative grade point average was Scholastic Assessment Test score and student effort. The best predictor of cognitive growth across all four populations on the 20 campuses was favorable classroom experiences. (CH)

PENNSTATE

(814) 865-6346
FAX: (814) 865-3638

Center for the Study of Higher Education

The Pennsylvania State University
403 South Allen Street, Suite 104
University Park, PA 16801-5252

AIR 2000

A Multi-Campus Study of Academic Performance and Cognitive Growth among Native Freshman, Two-year Transfers, and Four-year Transfers

J. Fredericks Volkwein
Director and Professor
Center for the Study of Higher Education
Penn State University
<volkwein@psu.edu>

Sondra Valle
State University of New York at Albany

Kelli Parmley
State University of New York System Office

Gary Blose
State University of New York System Office

Ying Zhou
Penn State University

This is a Research Paper presented at the AIR Forum, May 2000, Cincinnati, OH.
Questions about the study should be directed to the first author.

A Multi-Campus Study of Academic Performance and Cognitive Growth among Native Freshman, Two-year Transfers, and Four-year Transfers

ABSTRACT

This study examines the different factors that affect student learning and growth among four student populations: seniors who began as freshmen immediately after high school, those who transferred from two-year colleges, those who transferred from four-year colleges, as well as those who entered BA programs after years of military service or work. The research analyzes data from an outcomes survey administered to almost 2500 graduating seniors at 20 state colleges and universities in 1997. Drawing upon outcomes models in the literature, the study develops measures for pre-college characteristics, campus climate, and undergraduate academic and social experiences. Student cognitive outcomes are measured from two perspectives: student self-perceptions of their own learning, and faculty perceptions reflected in the cumulative grade point average.

The results indicate that the best academic outcomes, on average, appear strongest among the group who entered BA programs after work or military experience. The differences in outcomes between the two transfer populations are non-significant. For native freshmen and transfers alike, the best predictor of Cumulative GPA is total SAT score accompanied by student effort. Across all four populations on 20 campuses, the best predictor of cognitive growth is favorable classroom experiences.

A Multi-Campus Study of Academic Performance and Cognitive Growth among Native Freshman, Two-year Transfers, and Four-year Transfers

INTRODUCTION AND NEED FOR THE STUDY

This is a multi-campus study that examines the different factors that affect cognitive growth among four populations of graduating seniors: those who began as freshmen at their current institution immediately after high school, those who transferred from two-year colleges, those who transferred from four-year colleges, and seniors who entered their BA program after years in the work force or military service.

1. Have the four populations of seniors each experienced the same amount of learning and cognitive growth? What similarities and differences are found among these groups of seniors?

2. What pre-college characteristics and college experiences are most associated with the learning and academic performance of these four populations of graduating seniors

The importance of assessing the cognitive growth of college students results from an increased interest in college student outcomes, reflected in several national commissions' reports, state legislative mandates, changes in institutional accreditation standards, and demands for greater accountability (Middle States, 1996; Sims, 1992). This intense interest on the part of external sources has forced many faculty, administrators, and institutional researchers to shift their attention away from admissions profiles and resources and toward outputs and outcomes, like student learning. This focus on student learning places the emphasis on the cognitive outcomes of college. Cognitive outcomes relate most closely to the educational objectives of students, faculty, administrators, trustees, parents and others concerned with higher education. (Astin, 1977, 1993)

At present, much of the research on transfer students consists of single institution descriptive studies that report on degree attainment, academic achievement, or the adjustment of community college transfer students at four-year institutions. Researchers have paid little attention to the teaching-learning environment at the four-year college or university level as it pertains to the community college transfer student (Townsend, 1995). Moreover, we found no multi-campus studies of transfer student outcomes.

In particular, this study seeks to fill the gap in the literature first noted b Volkwein, King, and Terenzini (1986). Their study was the first to investigate the intellectual development

of transfer students. Scholars and practitioners alike need a more comprehensive understanding about the cognitive development of transfer students from both two-year and four-year institutions as these students continue to make up a growing portion of the higher education population. Pascarella and Terenzini (1991) emphasize the need for future research to focus on non-traditional students and continually stress the importance of studying "conditional effects", or how different student subpopulations may be affected differently by college.

CONCEPTUAL FRAMEWORKS

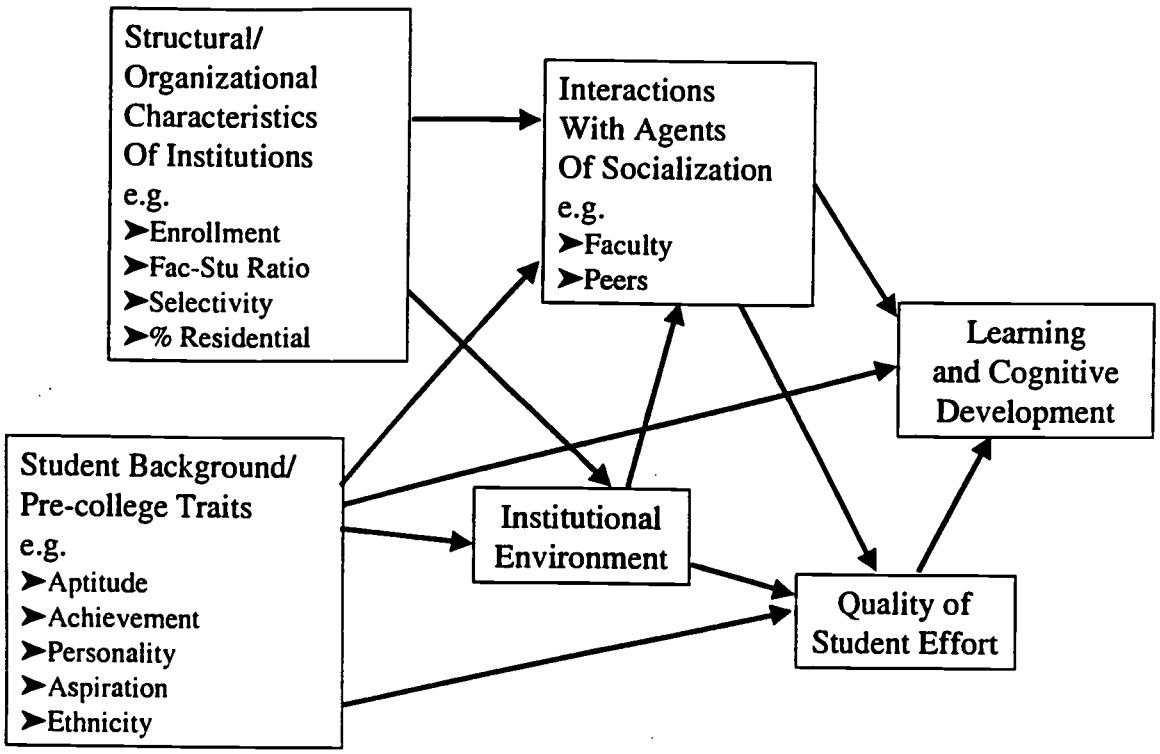
Structural/functional perspectives from the literature on organizations encourage researchers to give greater attention to those variables that reflect the influence of organizational structures (Hall, 1991). Studies of colleges and universities, as particular types of organizations, have shown that campus mission, size, wealth, complexity, and selectivity exert significant influences (ranging from small to large) on a variety of internal transactions and outcomes including student values, aspirations, educational and career attainment (Hall 1995; Pascarella and Terenzini, 1991; Volkwein 1986; Volkwein et al. 1998).

Student-institution fit models have been developed in the higher education literature largely to explain student departure. Although the separate models by Bean (1983), Tinto (1975,1987), and Cabrera (1993) were developed to study student persistence, several authors have demonstrated that the concepts and measures in such student-institution fit models can be applied to a variety of other college outcomes [Pascarella & Terenzini (1982), Pascarella et al.(1996); Terenzini, *et al.* (1984, 1987, 1995, 1996), Volkwein, *et al.* (1986), Volkwein (1991, 1998), Volkwein and Carbone(1994)].

Upon reviewing all the college impact models, two stand out. Cabrera's integrated model of student retention (1992, 1993) is especially valuable for increasing our understanding of the relationship among financial aid, family support, educational goals, academic integration, and academic achievement as influences on outcomes like persistence. Cabrera's integrated model contains many concepts relevant to this research, and combines the best elements from the earlier models by Tinto (1987) and Bean (1983) and incorporates many essential variables related to the research questions here.

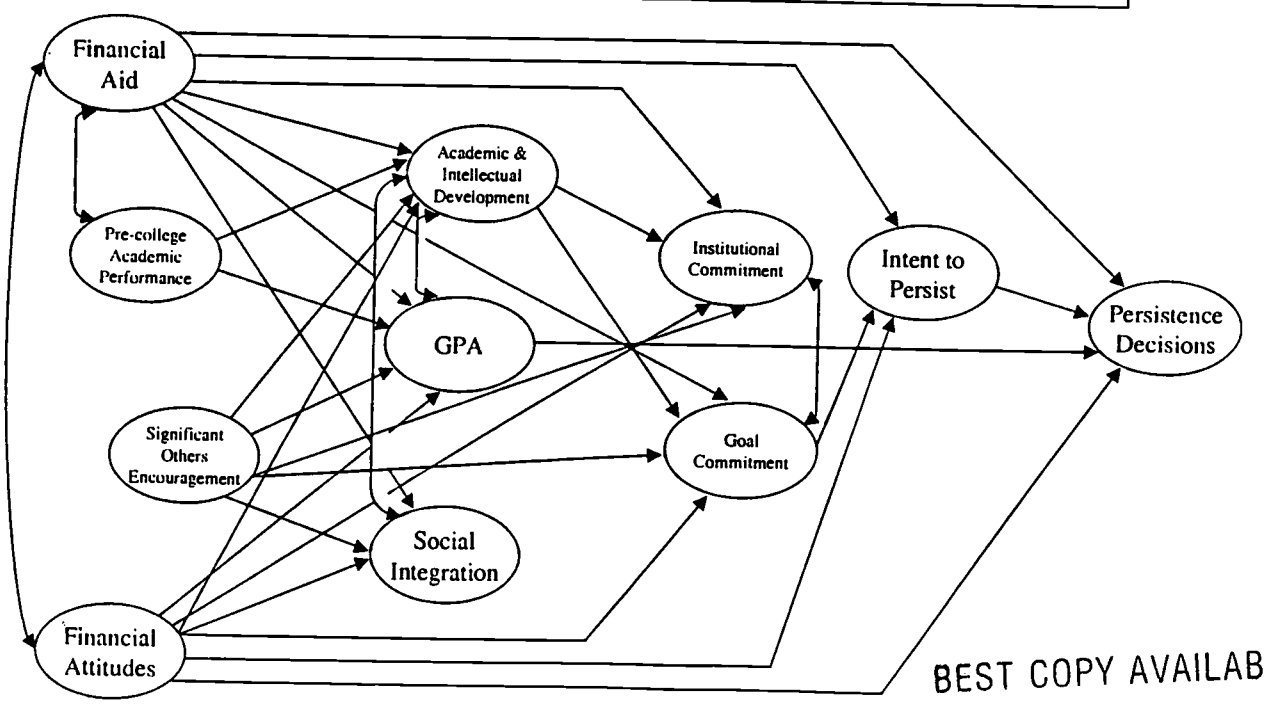
The second model is Pascarella's (1985). There is clear complementarity between the constructs of the Cabrera integrated retention model and Pascarella's outcome model. Both models take into account the influence of pre-college characteristics and interactions with facult and peers (academic and social integration), yet each model offers additional constructs worth of consideration. Pascarella developed his model in an attempt to identify potential influences found within the campus experience that affect student learning and cognitive growth, including organizational variables. Therefore, Pascarella's model serves as the essential theoretical base for

Pascarella's (1985) General Causal Model



Integrated Model of Student Persistence

(Cabrera, Nora, and Castaneda, 1992)



this study and all of its constructs are included. In addition, several constructs drawn from the Cabrera model also are included.

METHODOLOGY

This study's population consists of a representative sample of almost 2500 seniors at 20 state colleges and universities. "As compared to freshmen, seniors not only tend to know more but also to possess more highly developed reasoning and thinking skills" (Pascarella, 1985, p.10). Moreover, any study of the college impact on transfer students needs to allow as much time in the environment of the transfer institution as possible.

The multi-campus data base is unusually robust and includes information from thousands of seniors who entered BA programs during the 1990s. The data in our study contain measures that reflect an array of concepts from the above literature, including pre-college traits and achievement, academic and social integration, student effort, encouragement of family and friends, financial need and ability to pay, campus climates of diversity and tolerance, satisfaction with services and facilities, and campus structural characteristics. The data were collected in 1997 on a survey instrument that contains over 200 items of information in four categories:

1. Background information about age, class year, sex, ethnicity, employment, admissions status, type of enrollment, major, financial aid, and residence. In addition, we obtained information from admissions and financial aid systems on family income, SAT scores, high school grades, and rank in class.

2. Student plans, goals, and reasons for attendance.

3. Levels of Student satisfaction with an array of campus services and facilities, as well as with various aspects of the institution's academic, administrative, and social environments or climates. . These assessments are elicited on 5-point Likert-type agreement and satisfaction scales.

4. A variety of cognitive and non-cognitive experiences and outcomes, including classroom experiences, faculty contact, course taking patterns, graduation plans, loan indebtedness, college Grade Point Average (GPA), and self-reported growth.

The outcomes Instrument was developed by a committee of cooperating researchers and administrators at the participating institutions. The resulting instrument is grounded in the outcomes literature in general and the Pascarella and Cabrera models in particular. The surve was printed and scored by the American College Testing program. The variables used for the multivariate analysis in this study are shown in Table 1 and summarized here.

Dependent Measures

Student learning and cognitive development in this study is measured from two perspectives: students and faculty. First, this study will assess student self-perceptions of their own learning and cognitive development. Second, the study will examine the grades that students receive from faculty as indicators of student learning. Self-perception of learning is operationally defined as a student's response to survey items assessing the degree to which college experiences contribute to self-perceived intellectual growth (acquiring information, ideas, concepts and analytical thinking). This is measured by a 5-point scale with No growth (coded 1), Moderate Growth (coded 3) and Very Large (coded 5). The second measure of student learning and cognitive development, student academic performance, is operationally defined as the cumulative grade point average obtained from student records. Thus, we have one measure of student learning and cognitive growth based on the judgement of faculty, and the other is a measure based on the self-judgement of students.

While the research literature suggests that self-reported measures for individuals are positively but only moderately correlated with objective measures of growth and knowledge, when it comes to measuring the performance of groups of students, such measures have shown high reliability (Pace, 1985; Pike, 1995, 1996). Pike concludes that there is justification for the use of self-reports of student learning and academic development as general indicators of achievement. This conclusion agrees with the position expressed b Pascarella & Terenzini that "...student self reports provide a reasonable, if not totally adequate, indicator of cognitive growth" (1991, p.147).

Student learning and cognitive development also will be measured by the student's cumulative grade point average. Using college GPA as a measure of academic learning or achievement is not uncommon in the research literature (Astin 1993; Franklin, 1995; Terenzini, Pascarella, & Lorang, 1982; Pike, Schroeder, & Berry, 1997). Especially significant for this study is the consistent and significant correlation Astin found between GPA and the self-reported growth measures in his 1993 study. This finding supports the perspective that student perceptions of cognitive growth and actual cumulative GPA have a synergistic relationship, with each reinforcing the other. However, in light of the cautions expressed b Pascarella and Terenzini, (1991), this research will conduct separate regression analyses for the self-reported dependent variable with cumulative GPA **in** the model as a possible reflection of academic integration, and **out** of the model as a redundant aspect of the dependent construct.

Independent Measures

The independent measures in this study are more traditional in that they have been used in a large number of other higher education outcomes studies, and the exact wording of most survey items appears in Table 1. Thus, they will be summarized only briefly here.

Background and Pre-college Characteristics

Student background and pre-college characteristics are captured both from student

TABLE 1

CONSTRUCTS/VARIABLES	NATURE OF MEASURE	CRONBACH'S ALPHA	SURVEY ITEMS THAT COMPRISE EACH SCALE
DEPENDENT CONSTRUCT (OUTCOMES)			
Cumulative Grade Point Average	1 item		Cumulative GPA
Self-Reported Cognitive Growth	1 item		How large a contribution do you feel your educational experiences at this campus have made to your intellectual growth (acquiring information, ideas, concepts, and analytical thinking)?
Overall Growth / Development	6-item scale	0.86	1. Intellectual growth (acquiring information, ideas, concepts, and analytical thinking) 2. Personal growth (developing self-understanding; self-discipline; and mature attitudes, values, and goals) 3. Social growth (understanding others and their views, adapting successfully to a variety of social situations) 4. Preparation for further academic study 5. Preparation for career 6. Preparation for life-long learning (continued intellectual an personal growth after college)
Institutional Commitment	5-item scale	0.84	1. If you could start college over, would you choose to attend this college? 2. What is your overall impression of the quality of education at this college? 3. Indicate your level of satisfaction with the college in general. 4. Indicate your sense of belonging to this campus. 5. Indicate the college's concern for you as an individual.
Goal Clarity	3-item scale	0.72	1. I am certain of my career plans. 2. I am certain what I want to major in. 3. My purpose in going to college is clear.
Highest Degree Expected			
BACKGROUND AND PRECOLLEGE CHARACTERISTICS			
Age			
Se			Female or not
Race / Ethnicity			Minority or not
Total SAT Score			
High School Rank			
High School Average			
Family Income			24 categories (ranges) of income from Financial.Aid application
Pre-college Origins			Native frosh, 2-yr transfer, 4-yr transfer, work/military service
INSTITUTIONAL VARIABLES			
Size	1 item		Average annual FTE
Wealth	1 item		Total revenue / Average annual FTE
Complexity	1 item		No. of organizational units headed by VP or Dean or equivalent
Selectivity	2 separate items		1. The percentage of applicants admitted 2. The median SAT of students

TABLE 1 (Continued)

CONSTRUCTS/VARIABLES	NATURE OF MEASURE	CRONBACH'S ALPHA	SURVEY ITEMS THAT COMPRISE EACH SCALE
CAMPUS EXPERIENCES			
Academic Integration			
Classroom Experiences	8-item scale	0.89	1. How frequently have you been intellectually stimulated by th material covered in class 2. How frequently have you enjoyed your classes? 3. How frequently have you been satisfied with your academic experiences at this college? 4. How frequently have you had out-of-class assignments that were good learning experiences? 5. How frequently have you been in classes where you learned something? 6. How frequently have you had faculty members who came to class well prepared? 7. How frequently have you had instructors / professors who communicated effectively? 8. How satisfied have you been with the quality of instruction?
Faculty Contact	1 item		During the past year, how many times have you had discussions, meetings, or informal conversations with your instructors *outside* of the classroom
Faculty Interaction	4-item scale	0.78	1. Satisfaction with out-of-class availability of your instructors. 2. Satisfaction with faculty respect for students. 3. Satisfaction with availability of your advisor. 4. Satisfaction with value of the info provided by your advisor.
Student Effort	2-item scale	0.77	1. In general, I exercise good study habits. 2. At college, I give a higher priority to studying than anything else.
Social Integration			
Peer Relations	2-item scale	0.88	1. I have developed strong friendships with other students. 2. Relationships with other students have positively influenced my personal growth, values and attitudes.
Social Involvement	2-item scale	0.74	1. Satisfaction with opportunities for personal involvement in campus activities. 2. Satisfaction with opportunities for community service.
Family	1 item		My family has been a solid source of personal support for my academic efforts.
Friends	1 item		My friends have been a solid source of personal support for my academic efforts.

TABLE 1 (Continued)

CONSTRUCTS/VARIABLES	NATURE OF MEASURE	CRONBACH'S ALPHA	SURVEY ITEMS THAT COMPRISE EACH SCALE
Campus Climate			
Diversity	4-item scale	0.82	1. Satisfaction with racial and ethnic diversity of faculty. 2. Satisfaction with gender diversity of faculty and staff. 3. Satisfaction with gender diversity of student body. 4. Satisfaction with racial and ethnic diversity of students.
Openness / Tolerance	5-item scale	0.71	1. Satisfaction with the campus atmosphere of ethnic, political and religious understanding. 2. Satisfaction with freedom from harassment on campus. 3. Satisfaction with campus understanding of lesbian/gay/bisexual issues. 4. Satisfaction with racial harmony at this college. 5. Satisfaction with personal security/ safety on this campus.
Low Prejudice	3- item scale	0.89	1. In my experience, incidents of racial prejudice by faculty toward students seldom occur. 2. In my experience, incidents of racial prejudice by administrative staff toward students seldom occur. 3. In my experience, incidents of racial prejudice by administrative staff toward students seldom occur.
Academic Facilities	10-item scale	0.82	1. Satisfaction with classroom facilities. 2. Satisfaction with library facilities. 3. Satisfaction with library services. 4. Satisfaction with study areas. 5. Satisfaction with access to computing services & facilities. 6. Satisfaction with science laboratories. 7. Satisfaction with computing laboratories. 8. Satisfaction with learning labs (writing / language / math). 9. Satisfaction with general condition of buildings & grounds. 10. Satisfaction with campus bookstore.
Health Services	9-item scale	0.79	1. Satisfaction with health insurance program. 2. Satisfaction with health services. 3. Satisfaction with campus alcohol and substance abuse program and referral service. 4. Satisfaction with campus services for victims of crime. 5. Satisfaction with dissemination of campus crime statistics. 6. Satisfaction with campus efforts to address rape. 7. Satisfaction with campus response to needs of disabled students. 8. Satisfaction with campus AIDS education program. 9. Satisfaction with personal counseling services.
Financial Services	2-item scale	0.74	1. Satisfaction with registration procedures in general. 2. Satisfaction with billing and payment procedures.
Campus Recreation Services	5-item scale	0.71	1. Satisfaction with athletic facilities. 2. Satisfaction with recreational and intramural programs. 3. Satisfaction with college social activities. 4. Satisfaction with cultural arts programs (art/music/theater). 5. Satisfaction with student union-campus center.
Dormitory Facilities	2-item scale	0.85	1. Satisfaction with condition of residence hall facilities. 2. Satisfaction with residence hall services and programs.
FINACIAL STATUS			
Financial Need	1 item		It has been difficult to finance my college education.
Employment	1 item		No. of hours per week you are currently employed.

records and from student responses to survey items: age, male/female, race/ethnicity, famil income, pre-college work and military service, high school grade point average, rank, and SAT scores.

Institutional Structural and Organizational Characteristics

These organizational variables were drawn from the 1997 Integrated Postsecondar Education Database System (IPEDS). We selected the variables shown in Table 1 to reflect organizational size, wealth, complexity, and selectivity.

Academic Integration

This construct is measured by a student's response to survey items designed to assess the quality of his/her educational experiences: classroom experiences, faculty interaction and contact. These measures include: an eight-item classroom experiences scale, a four-item facult interaction scale, one item on the frequency of meetings with faculty outside of the classroom, and a two-item indicator of student effort.

Social Integration

This construct is measured by a student's response to survey items designed to assess the extent of formal and informal interactions with peers. These items include a two-item peer relations scale and a two-item social involvement scale. Other items in this category reflect the support of family and friends.

Campus Climate and environment

This construct is measured in a variety of ways that assess the student's perceptions of the institution's environment. These items include: multi-item scales reflecting openness and tolerance, diversity, low prejudice, health services, academic facilities, recreation, dormitory life, and financial services.

Finances

This construct is measured by a student's response to survey items designed to assess the degree of difficulty the student encountered in financing his/her college education. The surve items include one item on financial need and one on hours worked while pursuing the degree.

Goal Clarity

This construct is measured by a student's response to survey items designed to assess the extent of personal commitment to reaching educational and occupational goals.

Data Analysis

This study began by compiling descriptive statistics in preparation for multivariate analysis. A combination of principal components analysis, reliability analysis of constructed scales, and ordinary least squares regression was used successively. Principal components and reliability analysis were used to confirm the existence of key concepts and variables in the surve

Table 2
Mean Outcomes Scores for Seniors at 20 State Universities

Outcomes	Native Frosh (N = 1019)	2-year Transfer (N = 790)	4-year Transfer (N = 303)	Work/Militar (N = 344)
College GPA (on 4-pt scale)	3.03	3.02	3.19	3.36*
Intellectual Growth (on 5-pt scale)	3.95	3.85	3.82	3.98
Overall Growth/Development (5-pt scale)	3.80*	3.64	3.55	3.64
Institutional Commitment (5-pt scale)	3.51	3.48	3.40	3.54
Goal Clarity (5-pt scale)	4.23	4.23	4.18	4.40*
Highest Degree Expected (6-pt scale)	5.12	5.01	5.15	4.99

* = significantly different from the mean for all seniors at $p < .001$

instrument. We used a series of OLS stepwise regression models with each population to examine the influences of each variable controlling for all others.

RESULTS

Do these different populations of undergraduate seniors at 20 state universities exhibit different levels of educational outcomes? Table 2 displays the mean outcome scores for six outcomes – Cum GPA, intellectual growth, overall growth and development, institutional commitment, goal clarity, and highest degree expected. The mean scores across the four populations are remarkably similar, with only small between group differences on each scale. The few differences that are statistically significant reflect differences not only between native freshmen and transfers, as we expected, but more significantly between native freshmen and those who entered their B.A. programs after years of work or military service.

While the direct and the later entrants to college report similar levels of intellectual growth, institutional commitment, and ambitions for higher degrees, the two groups differ in that those with work or military experience report higher grades and greater goal clarity. Native Frosh on the other hand report significantly higher levels of overall growth than the other three groups.

For the population as a whole (N=2456), Table 3 displays the OLS regression results for the two outcomes that are the focus of this study – academic performance and cognitive growth. Each column shows the statistically significant beta weights for those variables that serve as predictors for the criterion, controlling for all other variables. The strongest predictor of Cum GPA is total SAT score, closely followed by high school rank and student effort. Also contributing to a significantly higher GPA are favorable classroom experiences, being female, and not entering the institution directly from high school. Controlling for all other variables, both transfer populations and those who entered after a period of work or military service report higher GPAs. Entering a selective college contributes to a lower college GPA. The model explains 34.8 percent of the variance in college academic performance.

The regression model for intellectual growth appears in the last column of Table 3. Controlling for all others variables, the classroom experiences scale is the strongest predictor – four times more important than any other variable. Student effort, peer relations, and attending a selective college also contribute positively to the intellectual growth reported by these students. The model explains 33.4 percent of the variance in self-reported intellectual growth. Thus, the two models in Table 3 are fairly robust, explaining over one-third of the variance.

Whereas Table 3 displays the multivariate results for the entire sample, in Tables 4 and 5 we examine the results of our analysis for each of the four separate populations of seniors. **Do**

Table 3
OLS Regression Results for GPA & Intellectual Growth
(N = 2456)

		CU GPA	INTELLECTUAL GROWTH
BACKGROUND VARIABLES	Female / Male	0.099*	
	Age		
	Race / Ethnicity		
	Total SAT Score	0.377**	
	High School Ran	0.211**	
	High School Average		
	Family Income		
Pre-college Origins	**Native Frosh (omitted)**		
	2-year Transfer	**0.182****	
	4-year Transfer	**0.131****	
	Work / Militar	**0.266****	
ORGANIZATIONA VARIABLES	Size		
	Wealth		
	Complexity		
Selectivity	% of Applicants Admitted		
	Median SAT Score	-0.102**	0.086*
CAMPUS EXPERIENCES / CLIMATE			
Academic Integration	Classroom Experiences	0.125**	0.473**
	Faculty Contact		
	Faculty Interaction		
	Student Effort	0.219**	0.110**
Social Integration	Peer Relations		0.133**
	Social Involvement		
	Family		
	Friends		
Campus Climate	Diversity		
	Openness / Tolerance		
	Low Prejudice		
	Academic Facilities		
	Health Services		
	Financial Services		
	Campus Recreation Services		
	Dormitory Facilities		
FINANCIAL STATUS	Financial Need		
	Employment		
TOTAL ADJUSTED R^2		**0.348****	**0.334****

*** = p < .01**
**** = p < .001**

these four different groups display different patterns of influence on academic achievement and cognitive growth?

The first column of figures in Table 4 displays the regression beta weights for the native freshman Cum GPA model (N=1019). Controlling for all other variables, the best predictors of Cum GPA are total SAT score, student effort, and high school rank, followed by age (which is a negative influence on Cum GPA). The second column of numbers shows the Cum GPA regression model for the 790 two-year transfers. Significant predictors, again, are total SAT, high school rank, and student effort, along with classroom experiences.

The third column of numbers shows that SAT Total and student effort are the only two significant predictors of Cum GPA for the population of four-year transfers. The regression models for the two transfer populations are less robust than the one for native frosh – the explain 20.8 percent of the variance (2-year) and 16.1 percent (4-year). The Cum GPA model did not work for the fourth population, perhaps because of the large number of cases with missing SAT scores and high school ranks.

In any case, the results presented in Table 4 indicate that SAT Total and student effort are the most significant, and almost equally important, predictors of Cum GPA in all three populations. Please note also that four important categories of variables turned out to be completely non-significant, when the four populations are analyzed separately. Despite the importance placed upon them in the higher education literature, none of the organizational variables (size, wealth, complexity, selectivity), none of the measures of social integration (peer, family, friends, involvement), none of the indicators of campus climate (diversity, tolerance, prejudice, services, facilities), and none of the financial variables (financial need, employment) are significant contributors to student CUM GPA across the 20 campuses.

Turning to Table 5, we see the beta weights for the four OLS stepwise regression models using student self-reported intellectual growth as the criterion variable. For the freshmen entering directly from high school, 32.1 percent of the variance in intellectual growth is explained by three measures – classroom experiences, student effort, and peer relations. For the two-year transfer group, only one variable – classroom experiences – accounts for the entire explained variance of 31.6 percent. For the four-year transfer group, again only one variable – classroom experiences – accounts for the entire explained variance of 28.9 percent. For the last group who entered the BA program after periods of work or military service, a robust 39.7 percent of the variance in intellectual growth is explained by four measures – classroom experiences, student effort, openness and tolerance, and campus selectivity (median SAT). Thus, attending a selective institution that contains a climate of openness and tolerance produces additional gains in intellectual growth for this group of seniors.

In the aggregate, Table 5 shows that for each of the four populations, the vitality of the classroom experience is the single most dominant influence on student intellectual growth. In the case of transfer students, the classroom experiences scale is the ONLY significant influence.

Table 4
OLS Regression Results for GPA

	NATIVE FROSH (N = 1019)	2-YEAR TRANSFER (N = 790)	4-YEAR TRANSFER (N = 303)	WORK / MILITARY (N = 344)
BACKGROUND VARIABLES				
Female / Male				
Age	**- 0.073***			
Race / Ethnicity				
Total SAT Score	**0.265****	**0.212****	**0.329****	
High School Rank	**0.196****	**0.155****		
High School Average				
Family Income				
ORGANIZATIONAL VARIABLES				
Size				
Wealth				
Complexity				
% of Applicants Admitted				
Median SAT Score				
CAMPUS EXPERIENCES/CLIMATE				
Classroom Experiences		**0.186****		
Faculty Contact				
Faculty Interaction				
Student Effort	**0.241****	**0.220****	**0.316****	
Peer Relations				
Social Involvement				
Family				
Friends				
Diversity				
Openness / Tolerance				
Low Prejudice				
Academic Facilities				
Health Services				
Financial Services				
Campus Recreation Services				
Dormitory Facilities				
FINANCIAL STATUS				
Financial Need				
Employment				
TOTAL ADJUSTED R^2	**0.337****	**0.208****	**0.161****	

*** = p < .01**
**** = p < .001**

Student effort is a significant contributor for the two non-transfer populations. None of the student pre-college and background variables are important influences, and likewise none of the financial variables (such as financial need and working) are significant. Additionally, the five measures of organizational size, wealth, complexity, and selectivity, as well as the four measures of social integration and the eight measures of campus climate are completely absent from three of the four models.

SUMMARY, CONCLUSIONS, AND SIGNIFICANCE

The present study of almost 2500 seniors at 20 state universities uses 1997 data to examine the academic performance and cognitive growth among four populations – those who entered their present bachelors degree institution directly from high school, those who entered after periods of work or military service, those who transferred from two-year institutions, and those who transferred from other four-year colleges. This is the first study to examine these populations with such a rich outcomes database. The only other similar research is the single-institution study of freshman and transfer populations conducted by Volkwein, King, and Terenzini, (1986) where constructs from Tinto's Student Integration Model were measured and applied to the dependent variable intellectual growth.

This study draws its research methods and measures from the models of college impact, (especially the models b Pascarella, 1985, and Cabrera et al., 1992, 1993), and uses a multi-campus population to enhance the generalizability of the findings. We examine academic outcomes among these four populations using an array of measures for college organizational characteristics (including campus size, wealth, complexity, selectivity), student pre-college background variables (including age, sex, race, high school performance, family income), student academic experiences (including classroom experiences, faculty interaction, effort), student social experiences (including peer relations, involvement, friends, family), campus climate and services (including measures of diversity, prejudice, openness and tolerance, and satisfaction with services and facilities), and financial variables (financial need and employment). We measure student cognitive outcomes from two perspectives: student self-perceptions of their own learning, and faculty perceptions reflected in the cumulative grade point average.

The results indicate that the best academic outcomes and goal clarity, on average, appear strongest among the group who entered BA programs after work or military experience. While we observed some statistically significant differences, the mean scores across the four populations are remarkably similar, with only small between group differences on each scale. The differences in outcomes between the two transfer populations are non-significant.

Thus, the first interesting finding is that by the senior year these four populations, who entered their institutions under very different circumstances, are remarkably similar in their demonstrated outcomes. In particular, the transfers and native freshmen exhibit almost identical

Table 5
OLS Regression Results for Intellectual Growth

	NATIVE FROSH (N = 1019)	2-YEAR TRANSFER (N = 790)	4-YEAR TRANSFER (N = 303)	WORK / MILITARY (N = 344)
BACKGROUND VARIABLES				
Female / Male				
Age				
Race / Ethnicity				
Total SAT Score				
High School Ran				
High School Average				
Family Income				
ORGANIZATIONAL VARIABLES				
Size				
Wealth				
Complexity				
% of Applicants Admitted				
Median SAT Score				**0.146****
CAMPUS EXPERIENCES/CLIMATE				
Classroom Experiences	**0.437****	**0.566****	**0.551****	**0.460****
Faculty Contact				
Faculty Interaction				
Student Effort	**0.135****			**0.168****
Peer Relations	**0.139****			
Social Involvement				
Family				
Friends				
Diversity				
Openness / Tolerance				**0.173****
Low Prejudice				
Academic Facilities				
Health Services				
Financial Services				
Campus Recreation Services				
Dormitory Facilities				
FINANCIAL STATUS				
Financial Need				
Employment				
TOTAL ADJUSTED R^2	**0.321****	**0.316****	**0.289****	**0.397****

*** = p < .01**
**** = p < .001**

levels of academic performance, growth, goal clarity, institutional commitment, and expectations for higher degrees. However, controlling for variations in background and talent, both transfer populations and those who entered after a period of work or military service report higher academic performance. Entering a selective college directly from high school contributes to a lower college GPA.

Second, we examined the four populations separately, expecting to find differential patterns of influence on academic achievement and cognitive growth. For native freshmen and transfers alike, the best predictor of Cumulative GPA in the senior year is student talent (total SAT score) accompanied by student effort. Across all four populations on 20 campuses, the best predictor of cognitive growth is favorable classroom experiences, and in the case of the two transfer populations, the ONLY predictor of intellectual growth is the vitality of the classroom experience. Thus, we find a good deal more similarity than difference among these groups, and no evidence that transfers from two-year and four-year institutions should be treated differently.

A third striking conclusion is the non-relevance of most organizational, financial, social, and campus climate variables for these academic outcomes. Moreover, even the student background variables are non-significant contributors to student cognitive growth.

These finding have significance for students, parents, faculty, and administrators alike. It appears that student age, race, sex, family income, financial need, and employment matter little in explaining student Cum GPA and cognitive growth. It also appears that campus size, wealth, complexity, diversity, facilities, and services have little impact on student learning. It could be that our enrollment management activities, our guidebooks, and our collective efforts to assist students make wise college choices are over-emphasizing the importance of these student and institutional characteristics.

What DOES matter most is the quality and vitality of the classroom experience combined with the student's own effort and study habits. In addition, student SAT scores and class rank are important predictors of Cum GPA. However, other variables appear to be important only for particular populations, but not generally. For example, strong peer relations is an important contributor to the cognitive development for those who enter college directly from high school and remain at one institution. However, peer relations is not an influential contributor to the intellectual growth of either transfer population, nor to those who delayed their entry until after a period of work or military service. For this "work/military" population, attending a selective institution that is characterized by a climate of openness and tolerance is more important to their growth than it is for the other three populations.

This line of research is important because of the current national interest in student success and faculty effectiveness. Our most consistently influential variable -- which we believe reflects classroom vitality -- is a scale of items that reflect the presence in the classroom of well-prepared and interesting instructors who give meaningful assignments, according to the students. Thus, our classroom scale emphasizes facult *behaviors*, rather than facult *characteristics*.

We believe these results suggest that faculty should realize the importance of providing a stimulating classroom experience and taking greater interest in student learning and growth. Moreover, enrollment managers should consider enhancing new student orientation to give greater attention to student academic, rather than social, adjustment. On the basis of this study, we suspect that one of the most important things an institution can do to improve student outcomes is to provide and protect a stimulating classroom experience and to help students develop good study habits. The faculty role may be crucial to the first, and academic support services may be crucial to the second, but campus leadership and budget priorities can also contribute. While investing in various academic support services is a valuable, even necessary, enrollment management strategy, the collective actions by faculty and student affairs staff to improve learning climates, both inside and outside the classroom, may have the greatest impact on student success.

REFERENCES

Astin, A. W. (1991). Assessment for excellence: The philosophy and practice of assessment and evaluation in higher education. New York: Macmillan.

Astin, A. (1977). Four critical years. San Francisco: Jossey-Bass.

Astin, A. (1984). Student Involvement: A developmental theory for higher education. Journal of College Student Personnel, 25, 297-308.

Bean, J. P. 1983). The application of a model of turnover in work organizations to the student attrition process. Review of Higher Education, 6,(2), 129-148.

Bowen, H. (1977). Investment in learning: The individual and social value of American higher education. San Francisco: Jossey-Bass.

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

Cabrera, A. F., Nora, A., & Casteneda, M. (1993). College persistence: The test of an integrated model. Journal of Higher Education, 64(2), 123-139.

Chickering, A., & Reisser, L. (1993). Education and identit . San Francisco: Jossey-Bass.

Feldman, K., & Newcomb, T. (1969). The Impact of college on students. San Francisco: Jossey-Bass.

Franklin, M. (1995). The effects of differential college environments on academic learning and student perceptions of cognitive development. Research in Higher Education, 36,(2)

Kearney, G. W., Townsend, B. K., & Kearney, T. J. (1995). Multiple-transfer students in a public urban university: Background characteristics and interinstitutional movements. Research in Higher Education, 36(3), 323-344.

Khalili, H. & Hood, A. (1983). A longitudinal study of change in conceptual level in college. Journal of College Student Personnel, 24, 389-394.

King, P. (1978). William Perry's theory of intellectual and ethical development. In L. Knefelkamp, C. Widick, & C. Parker (Eds.), Applying new developmental findings (New Directions for Student Services No. 4). San Francisco: Jossey-Bass.

Kraemer, B. A. (1997). The academic and social integration of Hispanic students into college. Review of Higher Education, 20(2), 163-179.

Kuh, G. (1995). The other curriculum: Out-of-class experiences associated with student learning and personal development. Journal of Higher Education, 66, 123-155.

Lacey, W. (1978). Interpersonal relationships as mediators of structural effects: College student socialization in a traditional and an experimental university environment. Sociology of Education, 51, 201-211.

Lehmann, I. (1963). Changes in critical thinking, attitudes and values from freshmen to senior years. Journal of Educational Psychology, 54, 305-315.

Lenning, O., Munda , L., Johnson, O., Vander Well, A., & Brue, E. (1974). Nonintellective correlates of grades, persistence and academic learning in college: The published literature through the decade of the sixties (Monograph No. 14). Iowa City, IA: American College Testing Program.

Mentkowski, M., & Strait, M. (1983). A Longitudinal study of student change in cognitive development, learning styles, and generic abilities in an outcome-centered liberal arts curriculum (Final report to the National Institute of Education, Research Report No. 6). Milwaukee, WI: Alverno College, Office of Research and Evaluation.

Pace, C. (1979). Measuring outcomes of college: Fifty years of findings and recommendations for the future. San Francisco: Jossey-Bass.

Pascarella, E., & Terenzini, P. (1980). Student-faculty and student-peer relationships as mediators of the structural effects of undergraduate residence arrangement. Journal of Educational Research, 73, 344-353.

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

Pascarella, E. (1984). College environmental influences on students' educational aspirations. Journal of Higher Education, 55, 751-771.

Pascarella, E., & Terenzini, P. (1991). How College Affects Students. San Francisco: Jossey-Bass.

Pascarella, E. T., Edison, M., Nora, A., & Terenzini, P. T. (1996). Influences on students' openness to diversity and challenge in the first year of college. *Journal of Higher Education*, 67, 174-195.

Perry, W. (1970). Forms of Intellectual and ethical development in the college years: A scheme. New York: Holt, Rinehart & Winston.

Pike, G.R. (1995). The relationship between self reports of college experiences and achievement test scores. *Research in Higher Education*, 36: 1-20.

Pike, G.R. (1996). Limitations of using students' self-reports of academic development as proxies for traditional achievement measures. *Research in Higher Education*, 37: 89-108.

Terenzini, P., Pascarella, E., & Lorang, W. (1982). An assessment of the academic and social influences on freshman year educational outcomes. Review of Higher Education, 5, 86-110.

Terenzini, P., & Wright, T. (1987). Students' personal growth during four years of college. Research in Higher Education, 161-179.

Terenzini, P. T., Springer, L., Pascarella, E. T., & Nora, A. (1995). Influences affecting the development of students' critical thinking skills. *Research in Higher Education*, 36, 23-39.

Terenzini, P. T., Springer, L., Yaeger, P., Pascarella, E. T., & Nora, A. (1996). First-generation college students: Characteristics, experiences, and cognitive development. *Research in Higher Education*, 37, 1-22.

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

Tinto, V. (1987). Leaving College: rethinking the causes and cures of student attrition. Chicago: Universit of Chicago Press.

Townsend, B. K. (1995). Community college transfer students: A case study of survival. Review of Higher Education, 18(2), 175-193.

Volkwein, J., King, M. & Terenzini, P. (1986). Student-faculty relationships and intellectual growth among transfer students. Journal of Higher Education, 57(4), 413-430.

Volkwein, J. F. & David Carbone (1994). "The Impact of Departmental Research and Teaching Climates on Undergraduate Growth and Satisfaction," Journal of Higher Education, 65:2 (March/April) 147-167.

Volkwein, J. F. and Lorang, W. G. (1996). Characteristics of extenders: Full-time students who take light credit loads and graduate in more than four years. Research in Higher Education, 37(1), 43-68.

Volkwein, J. F. and Malik, S. M. (1997). State regulation and administrative flexibility at public universities. Research in Higher Education, 38(1), 17-42.

Volkwein, J.F., Alberto Cabrera, Bruce P. Szelest, and Michelle Napierski-Prancl (1998) "Factors Associated with Student Loan Default among Different Racial and Ethnic Groups," Journal of Higher Education. 69: 2 (March/April) 206-237

Weidman, J. (1989). Undergraduate Socialization: A conceptual approach. In J. Smart (ed.), Higher education: handbook of theory and research Vol. 5. New York: Agathon.

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

☑ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").