Promoting Academic Achievement in College Students Through a Developmental Summer Program.

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Abstract

The academic achievement of a select group of first-year college students is examined. Students participated in a *Summer Bridge Program* for the purpose of developing basic academic skills while also being provided with an extended orientation to college life and expectations. A total of 67 students participated in the Program. Results show that significant improvement occurred in basic Math and English abilities. Significant correlations were observed between performance in the Summer Bridge Program and performance in Fall Term coursework as measured by GPA. Interestingly, females performed better than males academically, although males had higher scores on such pre-college predictors as HSGPA or standardized test scores. The benefits of special programs as they relate to higher education attainment and to fuller participation by minorities in American life are discussed.

Promoting Academic Achievement in College Students Through a Developmental Summer Program.

Efforts to diversify higher education in the United States have been underway for about thirty years now (Astone and Nunez, 1990). Although, the initial national impetus can be traced to the 1954 Supreme Court decision in Brown v. Board of Education which outlawed racial separation in education, the real changes began to occur in the 1960's and paralleled the civil rights movement with its focus on racial inequality in American life. Indeed, black college student enrollment more than doubled between 1970 and 1990 (Snyder and Hoffman, 2000). Today over 1.4 million black students are enrolled in colleges and universities in the United States. Hispanic, Asian-American and American Indian enrollment has also increased. However, the distribution of students by type of institution is uneven. That is, while about a third of white students attend two-year colleges, over 40 percent of black and Asian-American students do so, as do over 50 percent of Hispanic students.

Moreover, the drop-out rate for minorities is higher than for white populations at every level. The reasons for higher attrition rates are many, but include a lack of preparation for advanced coursework as well as family or community-based pressures such as poverty or violence. As Sims (1992) reported in a special edition of *Science,* black and Hispanic students were discouraged from taking tough science and math courses in high school by well-intentioned guidance counselors concerned that doing so might lower their GPA and lessen their chances for admission to college. Other reasons may include classroom disruption and the host of social ills that too often plague our central cities, such as violence, substance abuse, and unemployment, which cannot help but to affect adversely young people in the high school environment.

A relative lack of preparation for college level academic competition is often indicated by standardized test scores which show glaring gaps in achievement levels when broken down by race/ethnicity. For example, in 1994 the combined Scholastic Aptitude Test verbal and Math scores for white students was 938, while it was 799 and 740 respectively for Mexican American and black students (The College Board, 1994).

Similarly, the American College Testing Service scores for high school students revealed an average of 21.4 for whites and scores of 18.5 and 17.1, respectively, for Mexican Americans and blacks (Snyder and Hoffman, 2000).

Differential preparation for college level work, as reflected in standardized test scores or college-based placement tests, usually translates into distinct sequences of coursework. For example, calculus is generally deemed to be the appropriate first-year course in mathematics for college students, particularly at selective institutions, and any coursework below the calculus level is considered remedial. Yet, tens of thousands of American college students elect a pre-calculus course because they are not prepared for success in calculus. Many such students want to pursue majors in the sciences as well as other fields that require calculus and thus have little choice but to begin their college careers with a sequence other than calculus. Still other students come from homes in which English is not the primary language spoken or from high schools that have not prepared them for rigorous college-level writing and so begin with a remedial writing course. In fact, a recent report of the American Council on Education (Knoop, 1995) estimated that about 13% of American college students took at least one remedial course in college during the 1992-93 academic year, and estimated that among minority college students the figure was nearly twice as high (19 percent for black, Hispanic and Asian-American students).

Many such students are from lower-income families or were born outside the United States. Among the characteristics that lead admissions officers to accept these students is their potential for success, including a high degree of motivation for a college education. Motivation is necessary, but not sufficient for college success. Some students can succeed on the strength of their motivation not to give up. Conversely, every college professor can relate an experience of a student well-prepared academically for college work, but unmotivated to invest the time, effort, or commitment necessary to succeed. Yet, it is even more common, particularly at the more competitive institutions, for students to display enormous effort, but to encounter academic failure due to a lack of requisite skills involving quantitative and verbal abilities, precisely the areas where large discrepancies between groups are documented by standardized test scores. The “test score gap” is less an indication of future success in college, than it is reflection of past achievement, and as such

documents the degree of difference in preparation for college level work that different groups bring with them to the doors of the academy. Lessening that difference can only serve to level the playing field among differentially prepared groups of students.

An effort to improve the preparation of a select group of students for college-level work is made at the University of Michigan each year in the form of a Summer Bridge Program designed to improve basic skills in Math and writing as well as to provide an extended orientation experience to the academic community. Students selected for the program have high potential for success in college, but uneven performance on key predictors used by college admissions staff. Typically admissions staff will review students' grades in high school courses as well as performance on standardized tests such as the Scholastic Aptitude Test (SAT) or the American College Testing Service test (ACT). Uneven performance would be represented by a student with impressive high school grades, but modest test scores; or vice versa, high test scores and modest high school grades. The former situation might be characteristic of a student who excelled in a non-competitive high school, but who does not test well on standardized examinations. The latter situation might occur in the case of a student who attended a private selective high school and whose performance would not place him in the top tier of the school, but who's standardized test scores suggest the ability to succeed with college level work.

In its highly influential report entitled *One-Third of a Nation* (1988) The Commission on Minority Participation in Education and American Life observed that :

> "In education, employment, income, health, longevity, and other basic measures of individual and social well-being, gaps persist -- and in some cases are widening -- between minority groups and the majority population."

The Report went on to argue that promoting educational attainment would not only benefit minority populations, but the nation as a whole, citing the National Defense

Education Act of 1958, which noted that: “The security of the nation requires the fullest development of the mental resources and technical skills of its young men and women” and as a result legislated the provision of financial aid to promote college attendance as a matter of national importance. Such legislation implicitly acknowledged the strong link between educational attainment and such variables as income, employability, and life satisfaction.

The benefits of higher education that accrue both to individuals and to society are no less important today, although the reasons may have changed. One particularly important contributing change has to due with demographics, notably the aging of the United States population coupled with the reproduction rates for different segments of the population (Hodgkinson, 1985). One clear area of impact regards those who will comprise the workforce in the twenty-first century and as a result will contribute to the social security system. As summarized in *One-Third of a Nation,* in 1987, for every 100 workers contributing to Social Security, 30 individuals were be drawing benefits. By the year 2030, there will be about 50 beneficiaries per 100 workers. Furthermore, demographic projections indicate that a larger proportion of those potential workers will come from minority backgrounds. Thus, “anyone with a stake in Social Security also has a stake in the contributions that minority populations can make to it.” (ACE Report, 1988). The positive relationship between higher education attainment and employment, income, even longevity of life itself underscores the importance of continued investment in the promotion of education.

> “The plain and simple fact is that the full participation of minority citizens is vital to our survival as a free and prosperous nation.”
>
> *One -Third of a Nation* (1988)

The Summer Bridge Program is one of a much broader set of programs and initiatives that reflect institutional commitment to the ideals express in the report *One-Third of a Nation*. The Summer Bridge Program seeks to provide the opportunity for students with high motivation and potential for college success to participate in a program designed to improve their basic skills and provide an extended orientation to the University

community. Bridge Program students are placed in courses in Mathematics, Writing, Introduction to Computer Science, and study skills.

Purpose of study

The Summer Bridge Program has been offered since 1975, but few studies have rigorously examined the effects of the program or the correlates of achievement among students who participated in it. Thus, the purpose of this study is to report on the progress made by students in the 1995 Bridge Program and to assess their academic achievement upon fall enrollment.

Variables: A number of variables are examined for their effect on student performance, both during the Summer Bridge Program itself and also during the subsequent Fall term.
Among the variables examined were:

ACT - C composite score obtained by students on the standardized test (in some cases students took the Scholastic Aptitude test and not the

AAI an Academic Achievement Index (AAI) was established for each Summer Bridge students; selection to the Bridge program is sometimes based on the assessment by an admissions officer that a given student is weak in one of the standard predictors of college success, either High School Grade-Point Average (HSGPA) or standardized test scores; the AAI was created by combining the HSGPA with the standardized test score in order to balance the influence of these variables.

Math Test 1 Score obtained on Summer Bridge Mathematics Pre-test

Math test 2 Score obtained on Summer Bridge Mathematics Post-test

Engl Test 1 Score obtained on Summer Bridge English Grammar Pre-test

Engl Test 2 Score obtained on Summer Bridge English Grammar Post-test

SB Math Grade obtained in Summer Bridge Mathematics course

SB GPA Grade Point Average earned at end of Summer Bridge Program

GPA 1 Grade Point Average earned at the end of the first full Fall term

RESULTS

Student Progress in Summer Bridge

All participants in the Summer Bridge Program were administered diagnostic tests to assess skill ability in mathematics and grammar. Table 1.0 shows pre- and post-test data for the Summer Bridge students who took diagnostic tests in Mathematics and English grammar. The results of paired sample t-tests for both Mathematics and English test scores indicate that students improved their knowledge in each area as demonstrated by significantly higher scores on the post-tests.

Table 1.0
Scores obtained by Summer Bridge students on pre- and post-tests for Mathematics and English.

	Math Pre-test	Math Post-test	English Pre-test	English Post-test
N of cases	68	66	63	58
Minimum	5.0	20.0	45	50
Maximum	38.0	91.0	88	95
Mean	52.6	64.2	68.2	76.4
standard deviation	16.6	16.2	9.3	9.5

Results for Math t-test

Mean Difference = -11.79
SD difference = 11.12
degress of freedom = 65
T = -8.61; p < .001

Results for English t-test

Mean Difference = -8.22
SD difference = 7.59
degress of freedom = 57
T= -8.25; p < .001

Correlates of Achievement

Pearson correlation coefficients were calculated to determine the relationship between key variables. Table 2.0 shows the correlation coefficients for selected variables. No correlations were calculated for English grades because during the Summer Bridge program over two-thirds of students were enrolled in an English course graded as Pass/Fail and all but one student passed, resulting in virtually no variation on this variable.

Table 2.0 Correlations between selected variables

	ACT-C	AAI	SB Math	SBGPA	GPA1
ACT-C	1.0				
AAI	.372**	1.0			
SB MAth	.371**	.273*	1.0		
SB GPA	.397**	.300*	.454**	1.0	
GPA 1	.020	.179	.165	.332**	1.0

(n=68; df = 66) ** *p . < .01 ;* * *p. < .5*

Not all students who were enrolled in a Math course during the Summer Bridge program elected a Mathematics course during the Fall term. Thus, a separate correlation coefficient was computed for the 43 students who enrolled in Mathematics both during the Summer Bridge Program and during the Fall term. The correlation between grade earned in Mathematics during the Bridge Program and the grade earned in Mathematics during the Fall term yielded an $r = .489;\ df = 41;\ p . < .01.$

Fall Term Academic Achievement

Table 3.0 summarizes Summer Bridge student academic achievement across a number of variables. Summer Bridge students earned a mean GPA of 2.27 during their first full-time enrollment in the Fall semester, with 74% earning a GPA above 2.0; 18% had a GPA of 3.0 or higher; while 25% had a GPA below 2.0, the standard for good academic standing in the College. Closer examinations of these results show that female students outnumber males by a ratio of almost two-to-one and that although males had higher scores on pre-college predictor variables (such as HSGPA or SAT and ACT scores), females out-performed males on college academic achievement

variables such as SBGPA, CTP, and GPA. Analysis of Variance results indicated a significant gender effect for GPA 1 *(F=4.48; p < .05)* with females earning a GPA 1 of 2.42 while males earned a GPA 1 of 1.99. Females also earned slightly more credits than males during the first semester.

Table 3.0 Means and Standard Deviations for Male and Female Summer Bridge

	ACT-C	AAI	SBGPA	CTP1	GPA1
MALES (n=22)					
mean	20.3	50.5	2.42	9.32	1.99
s.d.	3.5	3.7	.76	4.12	.87
FEMALES (n=46)					
mean	19.4	49.6	2.55	10.46	2.42
s.d.	2.53	4.01	.79	3.03	.72

Predictors of Academic Achievement

Regression analyses were carried out to try to predict the academic achievement of Summer Bridge students. Standardized test scores, HSGPA, and SBGPA were used as predictors of first-term GPA. Neither HSGPA, nor ACT-C test score were effective predictors of first term GPA; nor was the combination of HSGPA and ACT-C as the AAI effective in predicting first-term GPA. However, both ACT-C and AAI were able to predict performance in the Summer Bridge Program as measured by SBGPA. HSGPA did not predict achievement in the Summer Bridge Program. Performance in the Summer Bridge Program as measured by SBGPA was a significant predictor of first-term GPA. These findings are summarized in Table 4.0.

Table 4.0 Summary of results of Regression Analyses for Predicting Academic Achievement as Measured by Summer Program GPA or First Term GPA.

For SBGPA

Predictor Variables	*Coefficient*	*Std. Error*	*T*	*p(two-tail)*
HSGPA	0.352	.240	1.46	.148 *n.s.*
ACT-C	0.125	.033	3.83	0.00 ***
AAI	0.060	.023	2.55	0.013 **

For GPA 1

Predictor Variables	*Coefficient*	*Std. Error*	*T*	*p(two-tail)*
HSGPA	0.406	.268	1.516	.663*n.s.*
ACT-C	0.026	.036	.706	.482*n.s.*
AAI	0.018	.025	.714	.478*n.s.*
SBGPA	0.313	.125	2.502	.015**

DISCUSSION

The attainment of a College education historically has meant a passport to a better life. Studies show that the college educated earn more, are healthier, and contribute more to society. Indeed, such attainment anchors that which is good in society. Yet, for significant segments of the population, the attainment of a college degree can seem out of reach. These may be the poor, the disadvantaged or ethnic minorities whose numbers are underrepresented among college students in relation to their numbers in the population at large. Despite the current dissatisfaction with affirmative action, it is still a legitimate and effective means of redressing generations old grievances and preparing for the future. Fortune 500 companies have indicated that they recognize the value of taking positive steps to create a more inclusive workforce. The future projects that an increased number of minorities will comprise the workforce of the future. Where are they now? In our schools, but many are achieving the kind of academic success that will make them competitive in the workforce of the twenty-first century. Attainment of a college education is still a major insulator against poverty and a catalyst for upward mobility. Academic success in the first year of college is the initial gateway through which students must pass if they are to achieve the benefits of higher learning in later life. This study has shown that a summer bridge experience can be a useful means of preparation for longer term college attainment.

These research findings support the adage that the best predictor of future academic success is past academic success. In particular, students with marginal credentials who participate in the Bridge Program with seriousness of purpose tend to perform well during the summer months and, as has been shown, such success seems to transfer to achievement during the fall semester as well. Interestingly, there was no correlation between standardized test score and success in terms of first-term academic achievement. One is left with the conclusion that more important to college success than standardized test score is what students actually do. Those who attend class regularly, are conscientious in completing coursework and who consult and heed the advice of knowledgeable counselors do well. This latter point may be of particular interest with respect to male students. The analysis of standardized test data showed that males achieved significantly higher scores than females, but males performed significantly worse than females in terms of academic achievement. Thus, what male students actually do, in contrast to what female students do, is likely to be the real determinant of academic success or lack thereof. Our program notes that female students, for example, are far more willing to seek out advice from counseling staff, or tutoring assistance from faculty than male students. Counselors report that males seldom simply check in to touch bases or to make connections with advising staff, a behavior that is rather common among female students. In fact, male students tend to see their advisors only for required meetings or in crisis situations, such as required consultations following poor academic achievement in a given semester. Yet, these male students are far from invisible on the campus. They tend to be active in social fraternities, intramural sports, political action and other student organizations. The male students may feel a need for such involvement and some of it may even have an altruistic motive, but it is hard to escape the conclusion that for many of them such activity amounts to a distraction from what should be their primary focus which is academic achievement.

Performance in the Summer Bridge Program courses was significantly correlated with performance in Fall term courses. Moreover, pre- and post-test results showed that students improved their skills in key quantitative and verbal ability areas. Thus, we may

conclude that participation in the Bridge Program, in general, has a positive effect in terms of leveling the playing field somewhat. Student evaluations also indicate that participants, in general, feel better prepared to handle the expected course-load of the fall semester. Taken together, these findings suggest that through participation in a developmental summer program, marginally prepared students can improve their preparation for college level work and go on to fulfill the potential for success recognized by admissions officers. Such programs represent one way in which we can improve the flow of minority students through the educational pipeline and in the process promote the full participation of minority citizens in American society.

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