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The Effect of an Academic Enhancement Program on Student Performance

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Abstract*: This study examines the utility of an academic enhancement program on the grade-point-averages of incoming freshman who enrolled at a historical black university in Texas. The value of the academic enhancement program, as shown by differences in the grade-point-average and academic performance of incoming freshmen who attended the program and those who did not attend the summer academy program,isevaluated as is the effect of demographic and school related factors of gender, ethnicity, SAT, enrollment status onstudent performance.*

Key Words*: Summer Bridge Program, GPA, Demographic Factors*

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I. Introduction

Colleges and universities have played a crucial role in providing access to a postsecondary education to underprepared high school graduates. The fact that those incoming first time freshmen students do not possess the necessary academic and social skills to be successful in college, has forced colleges and universities to be creative in retaining, progressing and graduating them, often applying various types of educational developmental programs. One of these programs, Summer Bridge Programs have demonstrated success in helping students make the transition from high school to college (Murphy et al., 2010; Strayhorn, 2011).

Earlier studies found little change in students' GPA by Summer Bridge Programs (Santa Rita and Bacote, 1991). However, more recent studies showed correlations between a Summer Bridge Program and students' GPA (Barnett, 2009). Since Grade Point Averages for incoming freshmen is a determination of academic achievement and student success, it is also known that effective learning and cognitive strategies are key factors that determine academic performance (Kleijn, Ploeg & Topman, 1994). Some of these strategies include proper time management, improved study strategies, better competency in taking examinations, and overall competency in academic course work. Those strategies are often extensively used in Summer Bridge Programs. Sansgiry, Kawatkar, Dutta and Bhosle, (2004) noted that in order to excel in academics at the college/university level, one must first learn how to study effectively. There are many effective ways to acquire information. It is then a matter of self-assessment to understand what works best for a specific person. In terms of students attending historically black colleges and universities (HBCUs), information regarding the impact of a Summer Bridge Program on students' GPA and their subsequent graduation rates are critical for the University as well as for the higher education community to better plan their resources and promote overall educational outcomes.

Despite numerous evaluating outcomes of Summer Bridge Programs, systematic and experimental data are still lacking simply because many of these studies don't follow students into the regular academic year(s), and such studies are even rare in HBCUs. Thus, there is a need of quantitatively studies evaluating the factors that are most relevant to Summer Bridge Programs with respect to their actual impact on student college success, especially in a HBCU setting.

Statement of the Problem

Universities and colleges have been faced with receiving students that are not academically prepared for college level courses, which results in remediating the underprepared population, developmental educational students. Given that universities and colleges are faced with one to three years of offering and funding non-credit courses and offering summer bridge type programs to advance the developmental education students administrators and faculty have to understand the needs of these students. This study, therefore, will address the following questions:

1. Is there a statistically significant difference between the grade point average of students who participated in the Summer Academy Program and those that did not participate in the Summer Academy Program?
2. Is there a statistically significant relationship between the demographic and school related factors of gender, ethnicity, SAT, enrollment status and the academic performance(GPA) of students who participated in the Summer Academy Program and those students who did not participate in the Summer Academy Program?

II. Literature Review

Various studies have been conducted (Barnett, Bork, Mayer, Pretlow, Wathington, and Weiss, 2012, Murphy, T. E., Gaughan, M., & Moore, R. H., 2010, and Strayhorn, 2011), examining and analyzing developmental education bridge programs, but the results are not consistent. This study will compare students at The University who were enrolled in the Summer 2010 Academy Program to students that did not participate in the Summer Academy and are enrolled as regular incoming freshmen in the Fall 2010 semester. It is hopeful that this research study will assist The University administrators and other institutions with this type of program in evaluating the effectiveness and quality of an academic enhancement program such as the Summer Academy program and its continuing utility to the University in future years.

This study is focused on a summer academy's impact on student academic achievement as illustrated by grade-point-average. According to Taylor (2012) few theoretical models are available to explain the purpose of bridge programs and academic enhancement programs. Theories explaining student success in postsecondary education (Kuh, Kinzie, Buckley, Bridges, & Hayek, 2006) are often confined to the postsecondary education context and arguably do not adequately address a program intended to bridge two educational levels. Summer Bridge programs exist because incoming first time freshmen are not prepared for college level courses and will need to spend their first college courses in developmental education courses. These developmental education courses are generally not credit based courses. The developmental education courses are designed to prepare the incoming freshmen for basic skills that they did not master in high school, these courses are also referred to as transition courses. Karp and Hughes (2008) developed a conceptual model for credit-based transition programs that is intended to explain program structures and interaction among the components of programs. Although bridge programs are not always (or often) classified as credit-based transition programs, this conceptual model is useful to consider variables and mechanisms that contribute to college persistence. Karp and Hughes (2008) claim their conceptual model "hypothesizes that student participation in college coursework and support services, along with the attendant growth in academic skills, knowledge of the social aspects of college, and motivation, will lead students to matriculate into postsecondary education" (p.838-839). It is relevant to note that their model was developed using five case studies of programs enrolling middle- and low-achieving students. Thus, the credit-based transition model may not be applicable to all bridge contexts; but does seem helpful to identifying mechanisms that facilitate matriculation and persistence to postsecondary education for students who have been underrepresented and underserved in the past.

Ely (2000) notes, multiple learning and instructional models are available to developmental educators, each offering a different and unique approach and framework. The most noteworthy of these cognitive models of learning include (a) the Factorial model, (b) the Developmental Stage model, (c) the Heuristic model, (d) the Taxonomic model, and (e) the Integrative model. While each model has its own strengths, each is narrowly focused in its approaches and instructional framework toward student learning and developmental education, except for the Integrative model. In reviewing the five models, Mickler (1988) explains, "The Integrative may provide developmental educators with a theoretical and philosophical framework that can be broadened to accommodate for learning as a complex human endeavor that encompasses many variables, not just those directly associated with the learner." Furthermore, this model "provides developmental educators with a conceptual framework with which to unravel the complexity of relationship among students, teachers, texts, and tasks." Instead of viewing the instructional surroundings through a confined lens providing limited exposure of those inherent characteristics associated with students, "educators can widen their perspective to a view that permits an accounting for all of the variables that are influencing the degree of success experienced by students." In short, this model takes on a holistic approach.

In discussing learning theory, Boylan (1986) explains, that most developmental programs were structured using at least three schools of learning theory including behaviorist, developmental, and humanistic. As noted by McMillan, Parke and Lanning (1997): Behaviorist theories of learning underlie the concept of programmed instruction, with the basic assumption that learners respond to external variables that can be programmed in particular ways that lead to mastery of the subject matter. Programs founded on behavioral theory usually feature self-paced, computer assisted instruction and, quite often, an open entry—open exit format, (p. 25). In many instances, this format is used in serving large numbers of students using a minimal number of faculty and staff, thus making the program inexpensive to operate.

In comparison, programs based on developmental theories of learning focus on students moving from one level of knowledge to the next after mastery (Boylan, 1986). In this format, the instructor, in addition to

providing a supportive and encouraging environment, provides challenges to the student at appropriate levels to stimulate learning (McMillan et al., 1997, p. 26). Due to heavy instructor involvement and small class size, this type of program is much more costly to operate (p. 26).

As noted by Boylan (1986), most developmental programs are a combination of behavioral and developmental models (p. 5). In many cases, the design of the developmental program is based on developmental theory, but the actual mode of delivery is associated with behavioral theory (p. 5). This combination format, while providing an element of cost effectiveness, also supplies the support required by most developmental education students.

In other instances, developmental programs are based on a humanistic model. This approach assumes that individuals are "naturally and intrinsically motivated to learn as part of the human need for personal growth and development" (Boylan, 1986). While this model relies heavy on instructor involvement, the role of the instructor is shifted to that of manager/facilitator, responsible for "creating an environment where learning will occur" (McMillan et al., 1997. Interestingly, the major responsibility for learning is shifted to the student. "Few remedial/developmental programs use this model because underprepared students are generally not ready for the responsibility of such a self-directed approach". When considering this approach, intellectual maturity should be a major consideration.

In addition to evaluating models, researchers have also examined the effectiveness of teaching methods used in developmental education programs. Dr. James Kulik, Senior Research Scientist for the Center for Research on Learning and Teaching at the University of Michigan, reports being impressed by "the favorable evaluation findings on individualized mastery-oriented teaching methods, such as Bloom's (1968) Learning for Mastery (LFM) and Keller's (1968) Personalized System of Instruction (PSI)" (as cited in Bonham, 1990, p. 17). Apparently, more than 100 evaluation studies have been conducted examining the results of these teaching methods. Remarkably, more than 90 percent report significant gains in student learning using an individualized mastery-oriented approach versus a conventional classroom approach (p. 17).

The art of designing a development program can be a complex and often frustrating task since there are so many models from which to select. Mickler (1988) warns educators to take a cautionary view when adopting an instructional system—some promise more than they can deliver (p. 5). In order to develop or maintain a successful remedial program, developmental educators need to be currently knowledgeable in all areas associated with developmental education, especially in the area of student learning.

According to Harr (2009), developmental education theories undergirding this study are based on three theorists' works that have guided developmental education since the 1960's: Arthur Chickering, William Perry, and Alexander Astin. Chickering's (1969) model built on *The Student Personnel Point of View's* emphasis on the whole student and identified seven vectors of college student development: (1) achieving competence, (2) managing emotions, (3) developing autonomy, (4) establishing identity, (5) freeing interpersonal relationships, (6) clarifying purpose, and (7) developing integrity (Chickering & Reisser, 1993). These vectors are applicable for traditional as well as non-traditional students and are useful in assisting students in managing time and the demands of school.

Harr (2009) and Perry (1970) believed that the idea of ethical and intellectual development is another student development theory that assists developmental educators in understanding student behavior. He argued that when students enter college, they are likely to view the world from a dualistic perspective and to look at faculty as authority figures that have the "right" answers. Thus, following Perry's theory that educators must work to move students beyond such a dualistic perspective, it is important that developmental educators facilitate students' ability to think for themselves, evaluate the relative qualities of different points of view, and make decisions accordingly (Higbee, Arendale, and Lundell, 2005).

Astin's (1984, 1985) theoretical work has also been fundamental to the understanding of college student development. He proposed that instead of viewing higher education as a place to produce "knowledge and trained manpower," educators must embrace a "talent development model," being aware that where students begin along the educational continuum is less important than how much they learn and develop (1985, p. 14, 16). Astin says, "Under this model, the major purpose of any institution of higher education is to develop the talent of its faculty and students to their maximum potential" (1985, p. 16). Astin's research urges educators to focus on enhancing access and retention while stressing the role of developmental education in encouraging students' individual talents (Harr, 2009).

Harr (2009) notes, the field of developmental education has embraced transformative theory. Transformative theory is a combination of Democratic Theory and Multicultural Education Theory, taking into consideration social justice issues associated with providing students with developmental education. Transformative Theory is an adult education based theory that suggests ways in which adults make meaning of their lives. It looks at "deep learning," not just content or process learning, as critical as those both are for many kinds of learning, and examines what it takes for adults to move from a limited knowledge of knowing what they know without questioning (usually from their cultures, families, organizations, and society). It looks at

what mechanisms are required for adults to identify, assess and evaluate new information, often sources that may look at how adults can identify, assess and evaluate new information, and in some cases, reframe their world-view or belief system. Transformative Theory encourages students to "evaluate both new information and the frames of reference through which the information acquires meaning" (Higbee, Arendale, and Lundell, 2005). This theory coincides well with the higher education movement in the 1990s to focus more on learning rather than teaching, and scholars within developmental education have embraced this paradigm shift.

III. Data Analysis

This study consisted of 202 first-time freshmen who were enrolled during Fall 2010 of which, 101 were Summer Academy participants during the Summer 2010 at The University. The samples were systematically selected from 300 Summer Academy participants and 800 freshmen who did not participate in the Summer Academy. Data for this study was obtained from the University's Office of Institutional Effectiveness. Frequency tables, descriptive statistics, F-test for the homogeneity of variances, two-population t tests and Multiple Regression and ANOVA for Regression were the statistical techniques employed in the analyses. The first section of the data analysis addresses the demographics of the fall 2010 cohort, as exhibited by the participants sampled. The second section evaluates the hypotheses, formulated earlier in the study. The final section summarizes the analyses.

Demographic Characteristics of the Sample

There were 202 students who participants in the study. Table 1 displays the ethnicity of the participants. Ninety-eight (97%) Summer Academy participants and 90 (89%) Non-Summer Academy participants were African American.Three (3%) Summer Academy participants and 7 (7%) Non-Summer Academy participants were Hispanic, 0 (0%) Summer Academy participants and 1 (1%) Non-Summer Academy participants were Caucasian, 0 (0%) Summer Academy participants and 3 (3%) Non-Summer Academy participants were American Indian, and all other ethnicities were at zero.

Table 1: Frequency Distribution of Subjects by Ethnicity

Variable	Number		Percent	
Ethnicity	SA	NSA	SA	NSA
African American	98	90	97	89
Hispanic	3	7	3	7
International	0	0	0	0
Asian or Pacific Islander	0	0	0	0
Caucasian	0	1	0	1
American Indian	0	3	0	3
Unspecified Ethnicity	0	0	0	0
Total	101	101	100	100

Table 2 displays the gender of the participants. Forty (39.60%) of the Summer Academy participants and 50 (49.50%) of the non-Summer Academy participants were male and 61 (61.40%) of the Summer Academy participants and 51 (50.50%) of the non-Summer Academy participants were female.

Table 2: Frequency Distribution by Gender

Variable	Number		Percent	
Gender	SA	NSA	SA	NSA
Male	40	50	39.60%	49.50%
Female	61	51	60.40%	50.50%
Total	101	101	100.00%	100.00%

Evaluation of Hypotheses

Ho_1: There is no statistically significant difference between the grade point average of students who participated in the Summer Academy Program and those who did not participate in the Summer Academy Program.

A Two-population t-test (Table 3) was performed for differences in the GPA, as the measure of academic performance, between Summer Academy (SA) participants and non-Summer Academy (NSA) participants. A statistically significant difference was not found in the grade point average of students who participated in the Summer Academy Program and those that did not participate in the Summer Academy Program at the 5% significance level. The results produced a t-value of -1.40745 and a P-value of 0.160845. Equal variances were assumed since the F-value equals .7665 with a corresponding p- value of 0.092702, which is not significant at the 0.05 level.

Table 3: Two Population t Test

F-Test Two-Sample for Variances

	Variable 1	*Variable 2*
Mean	1.12362	1.367518
Variance	1.316053	1.716948
Observations	101	101
df	100	100
F	0.766507	
P(F<=f) one-tail	0.092702	
F Critical one-tail	0.718536	

Correlation coefficient = -0.0041

T-Test: Two-Sample Assuming Equal Variances

	Variable 1	*Variable 2*
Mean	1.1236197	1.3675185
Variance	1.3160532	1.7169485
Observations	101	101
Pooled Variance	1.5165008	
Hypothesized Mean Difference	0	
df	200	
t Stat	-1.407453	
P(T<=t) one-tail	0.0804227	
t Critical one-tail	1.6525081	
P(T<=t) two-tail	0.1608454	
t Critical two-tail	1.9718962	

Ho_2: There is a statistically significant relationship between the demographic and school related factors of gender, ethnicity, SAT and enrollment status of the academic performance (GPA) of students who participated in the Summer Academy Program and those students who did not participate in the Summer Academy Program.

Multiple Regression (Table 4) was used to determine if there was a statistically significant relationship between student demographics and school-related independent variables, gender, ethnicity, SAT and enrollment status, and the academic performance (GPA) students (dependent variable) who did and did not participate in the Summer Academy. There is a statistically significant relationship between academic performance (as expressed by GPA) and the demographical and school related factors of gender, ethnicity, SAT and enrollment status at the 5% significance level ($F= 40.58$, $p\approx 0.0$ (1.72E-50)). Only English Grades, term gpa, cumulative hours earned as of Fall 2011, class sp11 and cumulative GPA as of Spring 2011 were significant predictors of academic performance at the 5% significance level (p-values<0.05). Additionally, there is also strong evidence of a linear relationship given that R^2 is 76.6%. 76.6% of the variation in performance can be explained by the demographical and in-school variables.

Table 4: Multiple Regression-GPA by Demographical and School-Related Factors

Regression Statistics	
Multiple R	0.875184
R Square	0.765948
Adjusted R Square	0.747073
Standard Error	0.620835
Observations	202

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	15	234.613	15.64087	40.57961	1.72E-50
Residual	186	71.69121	0.385437		
Total	201	306.3042			

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	0.02124	0.6257	0.033946	0.972956
Eng Grade Conversion	0.101268	0.046629	2.17179	0.031137
Math Grade Conversion	0.00936	0.041677	0.224588	0.822546
Gender	-0.09814	0.092453	-1.06149	0.289841
Ethnicity	-0.07468	0.111652	-0.66886	0.504417
TIME	0.302328	0.234221	1.290782	0.198381
inoutsta	-0.011	0.115289	-0.09542	0.924082
Term GPA	-0.36312	0.077151	-4.70655	4.91E-06
cum_earned_hours_Fall2011	0.050586	0.005137	9.84706	1.12E-18
alldevel	-0.16544	0.134971	-1.22577	0.221836
hsgpa	0.068768	0.095515	0.719977	0.472443
SAT Converted	0.000147	0.000487	0.301268	0.763546
Summer_Academy	0.033924	0.124151	0.273247	0.784966
first_generation	-0.15914	0.091397	-1.74124	0.083295
classsp11	-0.56717	0.14598	-3.88524	0.000142
CumGPA_Spring2011	0.524934	0.090189	5.820358	2.53E-08

IV. Conclusions

This study was conducted to examine the influence of a selected academic enhancement program on the academic performanceof incoming freshmen who enrolled at The University. Specifically, this study was concerned with the differences in the grade point average, retention and progression rates of incoming freshmen who attended the Summer Academy program and those who did not attend the Summer Academy program. Additionally, this study ascertained the relationship between selected demographic and school-related factors on the academic performance, retention and progression of incoming freshmen students who attended the summer program.

Frequency tables, descriptive statistics, F-test for the homogeneity of variances, two-population t tests, Multiple Regression and ANOVA for Regression were the statistical techniques employed in the analyses. Based on the results of this study, the following findings have been noted.

- There was not a statistically significant difference in the academic performance of students who participated in the Summer Academy Program and those who did not participate in the Summer Academy Program;
- There is a statistically significant relationship between the demographic and school related factors of gender, ethnicity, SAT, enrollment status and the academic performance (GPA) of students who participated in the Summer Academy Program and those students who did not participate in the Summer Academy Program.

One of the most significant findings of this study was the absence of significant differences in the academic performance of the Summer Academy and non-Summer Academy participants. Students thatparticipated in the Summer Academy program had similar grade point averages to the students that did not participate in the Summer Academy program as of Fall 2011. This finding is consistent with Adelman (1999) and Horn & Nunez (2000) in stating the positive impact of summer bridge programs on the grade point averages of its participants.

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