

## **A focus on the future: Pathways for undergraduate student persistence at North Carolina public historically Black Colleges and Universities**

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### **ABSTRACT**

Undergraduate withdrawal is a problem for public historically Black Colleges and Universities (HBCUs) in North Carolina. Research indicates that many factors contribute to this problem, including student personal characteristics, family background, and high school academic achievement. The purpose of this study was to learn whether student developmental courses, financial aid receipt, and parental socioeconomic status are predictive of undergraduate student withdrawal in public HBCUs in North Carolina. A sample of participants included first-time, first-year students who entered four public post-secondary institutions in North Carolina during the academic period from August 1999 to May 2005. Findings of the study suggest that a significant relationship exists between developmental math scores, a financial aid award, parental income of students, and undergraduate student withdrawal. Although the study utilized HBCUs in North Carolina, the students studied included ethnicities other than Blacks. While the study is exploratory, a number of policy implications and interventions are suggested.

**Keywords:** Undergraduate Student Retention, Minority Student Persistence, Developmental Education, Undergraduate Student Withdrawal.

### **Introduction**

Almost half of all first-time, full-time undergraduate students entering postsecondary education will withdraw before degree completion (Braxton, 2000; DesJardins, Ahlburg, & McCall, 2002; Swail, Redd, & Perna, 2003). Traditional undergraduate students who come from stable socioeconomic backgrounds and whose parents have gained at least a college degree are less likely to withdraw, while students who lack these advantages are more likely to withdraw (Goldrick-Rab, 2006). Moreover, research suggests that institutional retention policies and campus-level programs have had little effect on students who decide to withdraw from college or university before graduating (Astin, 1975; Braxton, 2000; DesJardins, Ahlburg, & McCall, 2002; Pascarella, 1982).

The literature available on student retention and withdrawal (Astin, 1987; Braxton, 2000; DesJardins, Ahlburg, & McCall, 2002; Pascarella, 1985; Pascarella & Terenzini, 1991; Tinto, 1993) shows that undergraduate students' social and academic successes are attributable to a host of reasons, such as high school grade point average, SAT scores, educational level of the parent(s), ability to pay for post-secondary education, and integration into the campus environment (DeBerard, Spielman, & Julka, 2004). However, these are just some of the issues facing undergraduate students in colleges and universities in the United States. Despite the personal, social, and economic value of a college education, many students continue to withdraw (Bean, 1990; Braxton, 2000; Tinto, 1975, 1993).

Two theories provided the foundation for the theoretical framework for this study and the perspective by which the issue of public university undergraduate student withdrawal was evaluated. Bean's (1990) model of student departure, which examined the cognitive and behavioral characteristics that students gain during their 1st-year of college, characteristics that can set the tone for the remainder of the collegiate experience, and Tinto's (1975, 1993) theory of student integration theorized that students who perform well academically and who integrate into the social environment during their first year of college stand a better chance of persisting to graduation. Because of the gap in the literature on withdrawal theory with respect to undergraduate students, the present study was designed to focus on the issue of undergraduate student withdrawal in four public historically Black Colleges and Universities (HBCUs) in North Carolina.

The purpose of this study was to test a theoretical model using a combination of student data files. The data files include course grades, financial aid, parent income, and demographic variables, all of which were used in this study to predict withdrawal of undergraduate students. Bean's (1990) model of student departure and Tinto's (1975, 1993) model of student integration provided the theoretical basis for the study.

### **Methods**

The study employed a non-experimental, quantitative research design involving secondary data. The study

examined the possible relationship(s) between the identified independent variables that included developmental math, developmental reading, and a financial aid award, and the dependent variable which was undergraduate student withdrawal.

### Data Sources

This study utilized a secondary data set of first-time, degree-seeking undergraduate students who were enrolled during the August 1999 to May 2005 academic years at four public historically Black Colleges and Universities in North Carolina (Fayetteville State University, North Carolina A&T State University, North Carolina Central University, and Winston Salem State University). With respect to the sampling method, a nonprobability method-in particular, archival data-was used. This sampling procedure was appropriate for the study because the data were obtained from preexisting and readily available UNC system student data. Only students who are categorized in the data set as first-time, first-year students with an observable placement test score were included in this study. A sample size of 3626 was achieved for this study. The population for the study consisted of the data on 98,000 undergraduate students who were enrolled at public universities in North Carolina, and the sample for this study consisted of 3626 first-time, first-year students.

### Data Collection

The data set comprises student enrollment at the selected four universities and includes demographic characteristics such as gender and race/ethnicity. A longitudinal analysis provided for the examination of persistence and retention for the entire data set. The level of significance was 0.05 if the probability were less than or equal to the significance level, the null hypothesis was rejected and the result considered to be statistically significant.

### Data Analysis

Logistic regression was the technique used to analyze the degree of the relationship between the predictor variables and student withdrawal. Logistic regression can be used to predict a dependent variable because of continuous or categorical independent variable and to determine the percent of variance in the dependent variable expressed by the independent variable (Babbie, 2007). In addition, logistic regression allows for the ranking of relative importance of an independent variable and illustrates the effect of covariate variables.

### Findings

#### Descriptive Statistics

Frequencies and percents were calculated on enrollment data obtained from four North Carolina public HBCUs. The frequency explains the number of occurrences for each value. With respect to enrollment within the state institutions represented in the data set, the majority of participants were associated with North Carolina A&T State University 47.7% and Fayetteville State University 22.0%. The majority of participants were female 56.3%, while 43.7% of participants were male. In

addition, the majority of participants were either Black 70.0% or white 23.9%, while all other ethnic groups (American Indian, Asian, Hispanic, and Other, all of which students self-identified) comprised 6.1% of participants. With respect to the ethnicity of the participants, the majority were Black, 70.0%, while White students comprised 23.9% of participants.

For first-year student math placement, 20.1% of participants were placed into developmental math. For freshman reading placement 6.1% of respondents were placed into developmental reading. For financial aid awards received, the majority of participants, 80.1%, did receive federal financial aid or other financial aid, 78.2%, while 50.2% received state financial aid. For parental income/expected contribution, the majority of participants' families, 23.5%, were in the \$40,000-\$49,000 income range. For withdrawal, the majority of participants, 74.1%, returned to college.

### Inferential Statistics

The following hypothesis provides an example of the technique that was employed to test each hypothesis.

*Null Hypothesis (Ho1):* There is no significant difference failing a developmental math course, as measured by developmental math score, and it does not predict student withdrawal, as measured by student withdrawal status.

*Analysis (Ho1):* The logistic regression formula for developmental math and student withdrawal used in this study was:  $Z \text{ Withdrawal} = B_0 \text{ Intercept} + B_1X_1 \text{ developmental math score} + B_2X_2 \text{ developmental reading score} + B_3X_3 \text{ a financial aid award} + B_4X_4 \text{ parental income} + \text{independent } X \text{ variable}$ .

### Hypotheses

To examine the hypotheses, a binary logistic regression was conducted to assess if passing the developmental math course (yes vs. no) predicts withdrawal (yes vs. no). The results of the regression were significant  $\chi^2 (1) = 32.28, p < .001$ , and the predictor variable accounted for 0.1% of the variance in the criterion variable. The results of the regression in table 1 suggest that as participants tended to have failed a developmental math course, participants were 1.56 times more likely to withdraw. In addition, the odds ratio suggests that every unit increase or failure in developmental math, the odds of the withdrawal increases by a factor of .64. The results suggest that students who failed a developmental math course have a higher risk of withdrawal. The results of the regression initially revealed that there was a significant relationship between failing a developmental reading course  $\chi^2 (1) = 342.89, p < .001$ , and the predictor variable accounted for, 1.4%, of the variance in the criterion variable. However, the beta coefficients of the regression presented in Table 1, show the results are not significant. The odds ratio had a factor of .000, which suggests no effect.

The results of the regression as it relates to student receipt of a financial aid award (federal, state, and/or other) were

significant  $\chi^2(3) = 256.020, p < .001$ , and the predictor variable accounted for, 1.1%, of the variance in the criterion variable. The results of the regression suggest that as participants tended to answer no to federal financial aid award, participants were 1.11 times more likely to withdraw. Likewise, as participants tended to answer no to a state financial aid award, participants were 1.14 times more likely to withdraw.

Furthermore, as participants tended to answer yes to other financial aid, they were 1.71 times more likely not to withdraw. The odds ratio suggests that every no response to receiving a federal financial aid award increases by a factor of .90 the odds of the withdrawal, while every no response to receiving a state financial aid award, increases the odds of withdrawal by a factor

of .88. The odds ratio suggests that every no response to receiving a financial aid award other than federal or state increases by a factor of 1.71 the odds of the withdrawal, which suggests no effect.

The results of the regression regarding parental income (household income of \$35,000 or less) and withdrawal were significant  $\chi^2(1) = 41.800, p < .001$ , and the predictor variable accounted for, 0.2%, of the variance in the criterion variable. The results of the regression suggest that for every extra \$1,000 increase in parental income, participants were 1.06 times more likely to return to school. The odds ratio suggests that for every \$1,000 increase in parental income, the odds of the withdrawal decreased by a factor of 1.06.

**Table 1:** Binary Logistic Regression of Developmental Math, Developmental Reading Taken, a Financial Aid Award, and Parental Income/Expected Contribution Predicting Withdrawal

Variable	<i>B</i>	<i>SE</i>	Wald	Sig.	Exp( <i>B</i> )
Developmental Math Failed	-0.44	0.08	29.54	0.001	0.64
Constant	2.06	0.16	163.43	0.001	7.82
Developmental Reading Failed	-20.05	1595.73	0	0.99	0
Constant	41.25	3191.46	0	0.99	$8.23 \times 10^{17}$
Financial Aid Award Federal	-0.1	0.04	5.59	0.018	0.9
Financial Aid Award State	-0.12	0.03	14.64	0	0.88
Financial Aid Award Other	0.54	0.04	223.78	0	1.71
Constant	0.62	0.11	34.41	0	1.85
Parent Income/Expected Contribution	0.06	0.01	42.3	0.001	1.06
Constant	0.75	0.07	121.2	0.001	2.11

## Discussions and Implications for Practice

The findings of this study showed that three variables (developmental math score, a financial aid award, and parental income) were significantly related to student withdrawal. Moreover, the results of the study demonstrate that the aforementioned variables have an effect on all students, not just Black students. Theories of student withdrawal and student departure models were developed more than 30 years ago and have yet to be replaced. Although the Tinto (1975) and Bean (1990) models have expanded the boundaries of research on student retention, they lack inclusion of cultural variables that would make the theory applicable to the realities of a diverse post-secondary student body (Guiffreda, 2003). Consequently, new withdrawal concepts that include cultural variables such as ethnic identity, self-efficacy, and level of acculturation will expand the theories of Tinto and Bean.

The findings of this study are consistent with prior research (Bettinger & Long, 2005; Calcagno, Crosta, Bailey, & Jenkins, 2007; Levin & Calcagno, 2008). Bettinger and Long (2005) made a distinction between students who completed their developmental math courses from those who did not complete the courses. They found that those who completed the developmental math course were more likely to persist to degree completion than students who did not complete

developmental math. The results of the regression suggested that as participants tended to answer no to federal financial aid award, they were more likely to withdraw. Furthermore, as participants tended to answer no to state financial aid award, they were also more likely to withdraw. Lastly, as participants tended to answer yes to other financial aid, they were 1.71 times more likely not to withdraw. Consequently, the results are consistent with research, which suggests that students who received some financial aid are more likely to persist than those who received no aid, financial aid allows the student to dedicate his or her efforts to academic and social activities (Kerkvliet & Nowell, 2005; Nora, Barlow, & Crisp, 2006; Singell & Stater, 2006). All types of financial aid positively influenced the decision to persist and not withdraw and any reductions in financial aid options and packages could reduce the graduation rate of minority students (Nora, Barlow, & Crisp, 2006; Singell & Stater, 2006). Relative to student withdrawal and financial aid is parental income. The results show that students at public HBCUs in North Carolina whose parents earn \$35,000 or less are more likely to withdraw and are less likely to persist to degree completion.

The goal of this study was to test the four research questions to discover the answers to those questions and to encourage thought and reflection among public higher education

policymakers and university administrators regarding policy decisions that will affect undergraduate student retention at public historically Black Colleges and Universities in North Carolina. It is hoped that others will be able to take the study findings and apply them. When system institutional policies succeed, they support the efforts of the institution to provide the best academic and social environment for the student. Moreover, when institutional policies take into consideration the unique background of a diverse student body, better policies can be developed (Swail, Redd, & Perna, 2003).

### **Recommendations for Further Study**

Although further research must refine and develop a more inclusive model to improve the overall student experience, the preliminary findings in this study are hopeful because they demonstrate that the cited factors do contribute to student withdrawal. A number of researchers have studied the value of developmental education programs by assessing course completion rates and comparing the persistence rates of students who completed developmental course work with those who fail to complete it (Fong, Huang, & Goel, 2008; Leake & Lesik, 2007). While this study was aligned with the aforementioned studies, I suggest that a more purposive study be conducted with respect to the profile of students that require remediation. An understanding of the personal characteristics of students who need one or more developmental courses warrants further examination. Moreover, other factors associated with student withdrawal such as institutional support, tutoring programs, counseling services, and academic advisement should be studied further.

While this study provides a case-by-case logistic regression method to determine the influence of specified variables on withdrawal, future research regarding withdrawal should improve methods and research design. This study originally sought to implement a multiple regression technique. However, the composition of the data led to utilization of a different method. As a result, the study moved to a case-by-case study logistic regression technique. While the quantitative approach may be used effectively at analyzing large scale data, it does not reveal the underlying reason why an event occurred. Consequently, a qualitative follow-up study should be conducted using similar participants. With respect to student withdrawal, a second recommended study should examine the issue from a social integration perspective. Employing an ethnographic research study of a cohort of traditional and non-traditional first-year students at five public HBCUs in North Carolina is recommended. This would allow the researcher to observe the personal characteristics of students within their campus environment.

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developmental courses warrants further examination. Moreover, other factors associated with student withdrawal such as institutional support, tutoring programs, counseling services, and academic advisement should be studied further. It is also suggested that researchers interested in the effects of the four factors identified in this study should replicate this study utilizing a research sample and control sample of Black students only at similar institutions.

Lastly, it is recommended that the UNC system develop a policy that mandates subsidized or unsubsidized loans as a last resort option for Pell Grant eligible students. Consequently, to reduce the loan burden on low to middle income students, the UNC system should develop a policy that reserves student loans for the junior and senior year. This policy would be specific to in-state students whose tuition costs are covered by Pell grant and/or other student aid. Even though the awarding of Federal Pell grants is based on economic status, not ethnicity, students receiving Pell grants in public universities in North Carolina are disproportionately members of minority populations or of so called disadvantaged backgrounds.

The poverty rate of Blacks and other ethnic minorities versus Whites in North Carolina is very high. For instance, the North Carolina Rural Economic Development Center (2008) suggests that about half of those living in poverty are White, 8.4%, but poverty rates are much higher for Blacks, 22.9%.; taking into account that at public HBCUs in North Carolina approximately, 62%, of new first-time first-year students enroll in at least one developmental learning course, and approximately, 67%, of students are eligible to receive the Pell grants, additional studies should be performed to establish successful retention and persistence plans specifically for students identified as at risk of withdrawal (University of North Carolina, 2008).

### **Limitations of the Study**

Only data drawn from first-time, first-year students who entered the four public post-secondary institutions in North Carolina (Fayetteville State University, North Carolina A&T State University, North Carolina Central University, and Winston Salem State University during the academic period from August 1999 to May 2005 were evaluated for this study, and the study was limited in the following ways. First, the study concentrated on only four public post-secondary institutions in North Carolina, and data may not be able to be generalized to the other public or private post-secondary institutions in the state or to public or private post-secondary institutions in other states. The results of the study may not be applicable to students enrolled before or after this time period. In addition, the study employed secondary analysis of a large data set. However, the study was limited to the use of only those variables contained in the data set such as gender, ethnicity, credit hours earned, course grade, type of financial aid received, and enrollment status.

### **Concluding Statement**

Policymakers and university administrators who are data driven will find success in solving the student withdrawal problem. They must be committed to providing the necessary time and resources to implement policies and programs that are grounded in research and reflective of the student body profile. This study supports the need for evaluation of specific variables that will help to mitigate the student withdrawal problem that has plagued American higher education for more than 75 years. Moreover, this study specifically focused on variables that the literature suggested have an impact of student persistence to degree completion. While student withdrawal is a complex and persistent problem for university officials charged with effectively managing growing enrollments and graduation rates, they must be cognizant of the value and significance of data that are at their disposal. Public university policymakers must use the data collected by the institutional research component of their respective universities systems to guide policy and program development. Furthermore, they must reference these data to inform the decisions that shape public higher education policy. The ramifications of effective higher education policy support the long-term economic and social development of the U.S. population. Policies that have been developed center on issues of student withdrawal, graduation rates, and developmental education. The guiding mission, however, of public higher education policymakers, university presidents, faculty, and staff remain constant: increased access to higher education and success in the form of degree completion for undergraduate students.

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