Challenges Facing Student Learning at HBCUs Today: An Exploratory Investigation

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Abstract

Our paper examines learning challenges that are facing students enrolled in a HBCU (Historically Black College or University) located in the southeastern United States. Our study looks at academic success as the outcome and the role played by gender differences in study habits, family and social background, and income equality differences at a historically black university. Special attention is paid to African-American students who represent the majority of populations of HBCUs, and the words "African-American" and "Black" are being used interchangeably throughout the article. A review of relevant literature is presented in Section 1. Primary sources, available statistical information, surveys (mainly Cooperative Institutional Research Program CIRP) and regression analysis were utilized in Section 2, which is the main quantitative part of this ongoing research. Comparisons, analysis of findings, evaluation of results, limitations and further research are presented in Section 3. Recommendations are provided in Section 4 followed by a set of conclusions.

Literature Review

Literature related to learning challenges of students in general, and African-Americans in particular, attending tertiary institutions of higher education focuses on four main areas: study habits, supplemental instruction, gender differences, and family income inequalities. These factors are discussed below.

Study Habits

Gender theory suggests that different behaviors, values, and attitudes of men and women influence their performance within the educational environment. These predispositions result from lifelong socializations that conform to socio-cultural standards of masculinity and femininity held within a society (Weaver-Hightower, 2003). The result is a growing gender gap in education along with a series of behaviors in males that interfere with educational and socialization success, such as engaging in disruptive conduct, challenging authority, and gaining the acceptance of peers (Epstein, Botvin and Diaz, 1998) in ways that are not constructive in academic settings. Previous research studies on the relationship between gender and study habits have displayed mixed results. Robinson, Drozd and Saarnio (1994) found that positive study habits were closely related to masculine characteristics, but were more useful predictors of behavior in females than males. A recent study by Rafi and Karagiannis (2013) found an increase in superior study habits by females in a HBCU environment as females have been outperforming males in the educational arena (also Aluja and Blanch, 2004).

Supplemental Instruction

Supplemental Instruction (SI) is an academic assistance program that utilizes peer-assisted, regularly-scheduled study sessions where students compare notes, discuss readings, develop organizational tools, and practice test items while working together. The sessions are facilitated by "SI leaders" — students who have excelled in these courses and who attend all class lectures, take notes, and act as model students (Rafi and Karagiannis, 2013).

SI was created in 1973 at the University of Missouri-Kansas City, an institution that had successfully transitioned from a small private school to a large state school with a diverse student body and high student attrition. SI was a program developed to promote academic assistance to the entire student body to help them improve their course work performance. As such, supplemental instruction is not remedial education but performance-assistance education. An influential article about SI, entitled "Breaking the Attrition Cycle: The Effects of Supplemental Instruction on Undergraduate Performance and Attrition", appeared in the Journal of Higher Education, popularizing the program nationwide (Blanc, DeBuhr and Martin, 1983). With the aid of Federal funding, the University of Missouri-Kansas City was able to widely disseminate the program whereby SI is now implemented in approximately 1000 institutions worldwide, in well over a dozen countries including Australia and the UK (Arendale, 2000).

Gender Differences

Educators and other social scientists focus on gender differences in learning to maximize teaching effectiveness. Although research reveals that gender differences exist between male and female students at every level of education and learning, these differences cannot be easily explained as studies have led to complex and inconclusive results. Other researchers (Hillman and Rothman, 2003; Rafi and Karagiannis, 2013) have found that gender differences exist in various educational outcomes, such as test achievement and retention rates across both Australian and American school systems. Furthermore, gender differences in learning have been linked to biological factors even though Halpern and Tan (2001) attributed much of the differences in visual-spatial ability to physical characteristics of height, weight, and lung capacity, not gender.

Family Income Inequalities

Palmer, Davis and Hilton (2009) identified challenges that impeded academic success of black males at an HBCU. One critical factor was the lack of adequate financial support. When these students are unable to meet their tuition and fee deadlines set by their university, they may not be allowed to return to classes and their schedules are dropped. Many students do not perform well in school because they are unsuccessful in their attempts to balance the requirements of working hours (usually 40hrs/week) while attending school on a full-time basis. These students frequently work full time to supplement their financial aid although most experts in the field caution that these students should work no more than 20 hours per week.

Tinto (1975) conducted a comprehensive review of factors involved with college dropout. He concluded that the family's socioeconomic status appears to be inversely related to dropping out. In other words, students hailing from lower socioeconomic backgrounds have a higher dropout rate. Blanden and Gregg (2004) conducted a comprehensive study of the effects of income inequality in Great Britain. They concluded that "it is clear from existing research that children from poorer backgrounds have worse educational attainments than their better-off peers" (p. i). Acemoglu and Pischke (2000) found that "a 10 percent increase in family income is associated with a 1.4 percent increase in the probability of attending a four-year college." Clearly, graduation rates are higher for those students coming from economically privileged backgrounds.

From the literature review above, the following propositions related to African-American students are posited:

#1 At the undergraduate level, African-American females will outperform African-American males in postsecondary education because of their better habits and higher positive attitudes toward learning regardless of their family structure and background.
#2 African-American females outperform African-American males in post-secondary education at the under-graduate level because they are more willing to seek help through Supplemental Instruction regardless of their family structure and background.
#3 Both African-American males and females who require supplemental coursework for academic discrepancies in their college preparation can benefit from participation in supplemental instructions.

Research Methodology

Research Subjects

The research subjects were first-year students from a HBCU located in an urban setting in the southeastern United States. The target population was limited to African-American students for this study. Students classified under other ethnicities were omitted. The classification "Black" or "African-American" adheres to the definition of demographic groups designated by the United States Census Bureau (U.S. Department of Commerce, 2014). The study was conducted at Winston-Salem State University (WSSU) from Fall 2007 through Fall 2010. The survey population or sample consisted of 4879 Black male and female students who were enrolled in seven consecutive semesters and registered for courses examined. Only 33% of the students in the sample were male while 67% were female. This sample composition by gender is in line with the trends of African-American undergraduate enrollment (Aud, Fox, and Kewal Ramani, 2010, p. 117).

Research Design

The study employs a mixed-method design (Greene, Caracelli, and Graham, 1989; Tashakkori and Teddie, 1998) that combines qualitative and quantitative techniques to address questions about academic preparedness of first-year students and, subsequently, retention and graduation rates. The mixed methods approach facilitates data collection sequentially and in parallel to measure the success of first-year students as they matriculate from First Year across the continuum of a four-year undergraduate program.

Through the mixed-method design, the study utilizes a multi-method data collection strategy to collect data and corroborate the data obtained. Data for this study were collected through Cooperative Institutional Research Program (CIRP) surveys, Accuplacer placement test scores (an assessment method used primarily by more than 1,000 high schools and colleges in the USA: James, 2007), and academic assistance acquired through the SI program. CIRP survey results were obtained from the Institutional Assessment and Research (IAR) group.

The primary instrument is the CIRP Survey that was developed specifically for this study. Other instruments were developed through a mixture of statistical data collection from primary sources within the University of North Carolina University System and the results from participation of Research Subjects in Supplemental Instruction.

The CIRP Survey was designed and used for descriptive data analyses in investigating student preparedness and attitudes/habits at the high-school level toward learning by gender and other socioeconomic factors. The CIRP instrument was also used to support quantitative statistical analysis in the calculation and comparison of the probabilities of retention and graduation of African-American students among the following demographical categories:

- Single-parent vs. two-parent households
- Female vs. male retention rates
- First-generation vs. second-generation students.

As a follow-up, a SI Program was established through identification of seven courses for first-year and second-year students. Students enrolled in one or more of these courses would be observed and recorded based upon their participation or non-participation in supplemental instruction as described in the literature review.

The seven courses identified for the SI program are:

1) Principles of Financial Accounting (ACC 2316)
2) Biological Concepts (BIO 1301)
3) Anatomy and Physiology I (BIO 2311)
4) General Chemistry I (CHE 2311)
5) Principles of Macroeconomics (ECO 2312)
6) World Civilization from 1600 to the Present (HIS 1302)
7) Elementary Statistics (MAT 2326)

The Supplemental Instruction courses mentioned above were chosen because of the high failure and withdrawal rates by the students. The criterion of "academic difficulty" was determined by the high percentage of D, F, and W grades (30% or greater) for these courses during previous semesters. The majority of students enrolled in these courses were freshmen or sophomores. Faculty members who had taught these difficult courses extensively before, and were teaching them again, were chosen for the purpose of the project.

Additionally, students who had performed well in the chosen courses during previous semesters were recruited as tutors for these courses.

The tutors were required to attend the lectures for their assigned courses: each tutor was assigned to attend and offer tutoring for one course only.

Tutors at Winston-Salem State University were trained based on the model developed by the University of Missouri at Kansas City (UMKC) known as Supplemental Instruction (SI), and were taught to engage students in the course content and to create an active learning environment. Research has clearly shown that active learning improves the understanding of course material among the students (Chickering and Gamson, 1987). SI sessions are review sessions facilitated by the trained tutors so as to improve student performance and retention. The sessions were scheduled twice per week for each course, 1.5 hours per session. Studies at other universities that have utilized SI have shown that students who participate in the SI sessions achieve higher grades than non-SI participants.

Furthermore, regression analysis is utilized. The logistics regression estimates the odds of being retained or graduated in a given year with regards to each independent variable in regression, holding all other variables constant. The following model is used:

$$\text{Prob(Retention/Graduation)} = B0 + B1\ \text{Demographics} + B2\ \text{Single Family} + E$$

where B1 is a vector of coefficient for the demographic characteristics (female, first generation student) and B2 is a vector of coefficient for single family characteristic.

Data Collection

All incoming First-Year students were required to take the CIRP Survey in the seven-consecutive semesters from Fall 2007 to Fall 2010. The survey was revisited after each year to measure the students' retention and where feasible, graduation rates. To complement CIRP, SI data with respect to participation and non-participation during the Fall 2007 through Fall 2010 period were collected utilizing independent variables for evaluation against the dependent variables' retention rate and graduation rate to measure the success rate of black male and female students.

Validity

The CIRP Survey relies heavily upon dimensions of attitude and behavior/habits. Specific indicators by measurement categories are given in Table 1. Face validity, while less systematic, is an important judgment which the researchers engaged in for this study because CIRP Survey responses are self-reported by the research subjects. This could introduce bias in the form of socially desirable responding (SDR) where respondents have a tendency to give answers that make them look good (Paulhus, 1991). Further, men and women have been found to differ in socially desirable responding (Ones and Visweswaran, 1998).

Reliability

One important type of reliability is "agreement" especially for a longitudinal study. Through Supplemental Instruction professors and tutors as well as Academic Counselors, the researchers were able to minimize bias in SDR through time-series analysis of consistency of male and female performance over the seven consecutive semesters. This determination of consistency in performance reflects strong reliability in the Survey measurement through consistency of observations and results (McMillan, 2000).

The CIRP Survey draws from strong theory in behavior, habit strength, and attitudes for many of its key variables built around the specific dimensions. For example, frequency of past behavior is a standard indicator of habit strength (Triandis, Adamopoulos and Landis, 1978; Triandis, 1977) and is the best predictor of future behavior (Ouellette and Wood, 1998). Ouellette and Wood confirmed that frequency of past behavior and habits are linked and have a direct impact on future performance.

Students who read for pleasure are likely to attribute their behavior to their love of the activity leading to intrinsic motivation (Bradley and Mannell, 1984). The socioeconomic factors listed do not automatically imply less income or lower economic status. However, most often, the student coming from a single-parent household, especially when that parent is female will struggle economically which, as observed from the literature, affects the student financially and subsequently academically (Aud, Fox and Kawal Ramani, 2010, p. 17).

Table 1: Sample of CIRP Indicators by Category

Category	Measure	Assertion
Preparedness	B or Better	Students with less than a B are not as prepared for a 4-year college that is expected to lead to greater success.
Attitude	Bored	Students who are not bored in class are expected to have a greater positive attitude toward learning, such as being more attentive to in-class instructions that can lead to greater success.
Behavior/Habits	Studied > 6 hours per week	Students who studied more than 6 hours away from class are expected to display better habits and possess a higher positive attitude to learning success.
Behavior/Habits	Watched TV > 6 hours per week	Students who watched less television are expected to put more emphasis (i.e., higher attitude) on their academic studies.
Behavior/Habits	Read $\geq$ 6 hours per week for pleasure	Students who read more simply for pleasure are expected to put more emphasis (i.e., higher attitude) on gaining new knowledge that will only enhance their academic success.
Family Structure	Single-parent household	Designed to measure the impact of a key socio-economic factor
Family Background	First-generation	Designed to measure the impact of a key socio-economic factor

Case Study and Results

Cooperative Institutional Research Program (CIRP)

The CIRP survey results (see Table 2) indicated that female students had a much higher percentage of positive attitudes/habits towards learning than male students.

Table 2: CIRP Survey Results across the Research Period, Fall 2007-Fall 2010

Measure	Gender	Percentages by Gender
High school average grade B or better	Male	57
	Female	70
Felt bored in class during senior year in high school	Male	41
	Female	35
Studied more than 6 hours outside of class per week during senior year in high school	Male	14
	Female	21
Watched television for 6 or more hours per week during senior year in high school	Male	41
	Female	28
Read for 6 or more hours per week for pleasure during senior year in high school	Male	4
	Female	11

Supplemental Instruction

All students enrolled in the SI courses had equal opportunities to seek additional help through the SI program. At the end of the semester, students' participation in the SI program and final grades of attendees vs. non-attendees were determined. These were then compared to the initial CIRP results.

On average, 29 percent of enrolled females and only 19 percent of enrolled males participated in the SI sessions (see Table 3). Female students participated in the SI sessions by more than a 50 percent higher rate than their male counterparts. T-test results indicated that female participation in the SI program was statistically significant over male participation at the 1 percent significance level.

Table 3: African-American Male vs. Female Enrollment and Participation in First-Year Courses in the SI Program, Fall 2007-Fall 2010

SI Course	Total Per Course Enrollment	Total Male Per Course Enrollment	Total Female Per Course enrollment	Percent of Enrolled Males Participated in the SI Sessions	Percent of Enrolled Females Participated in the SI Sessions
ACC 2316	800	415	385	8	5
BIO 1301	604	160	444	22	34
BIO 2311	560	109	451	23	45
CHE 2311	342	102	240	39	58
ECO 2312	596	313	283	15	24
HIS 1302	364	131	233	12	21
MAT 2326	1004	182	822	12	15
Averages	610	202	408	19*	29*

*P<0.01

In Table 3, it is observable that several courses had much higher student participation than others. BIO 2311 (Anatomy and Physiology I) course had the biggest difference in male vs. female participation, such that, only 23 percent of the males participated in the SI sessions as compared to 45 percent of female participants. MAT 2326 (Elementary Statistics) had the smallest percent difference in male vs. female participants such that, only 12 percent of the males participated in the SI sessions as compared to 15 percent of female participants.

The main reason for using the Supplemental Instruction method is to reduce the D, F, or W grades (DFW) for students in the above mentioned courses. For these selected courses, the DFW rates for both male and female attendees and non-attendees were computed (see Table 4). On average, female participants' failure rates (22% DFWs) were much lower than male participants' failure rates (34%). T-test results revealed that the difference in percentage of DFWs obtained by female students from male students was statistically significant at the 1 percent level.

The most prevalent difference in male vs. female DFWs rates occurred in MAT 2326, in which the average DFW rate for male SI session participants was 58 percent as compared to an average DFW rate of 28 percent for female SI session participants. The smallest difference between the DFW rates of male and female students occurred in ACC 2316 (Principles of Financial Accounting), in which male SI participants had the DFW rate of 22 percent as compared to the 21 percent DFW rate for the female SI participants.

Female students visited the SI sessions more often than male students, and this is a main reason why female students performed better than their male counterparts. On average, male SI participants visited the SI sessions three times per course during the period Fall 2007-Fall 2010. On average, female students visited the SI sessions four times per course. Overall, the DFW rates for African-American male and female students that did not attend the SI sessions were significantly higher than the DFW rates of male and female SI participants (see Table 4).

Table 4: African-American Male vs. Female Participants' Percentage DFW's Comparison, Fall 2007-Fall 2010

SI Course	Percentage of DFWs of Male SI Participants	Percentage of DFWs of Female SI Participants	Percentage of DFWs of Male non-SI Participants	Percentage of DFWs of Female non-SI Participants
ACC 2316	22	21	50	45
BIO 1301	51	41	51	42
BIO 2311	36	38	66	58
CHE 2311	32	9	57	47
ECO 2312	27	11	36	32
HIS 1302	14	8	34	21
MAT 2326	58	28	48	40
Averages	34*	22*	45*	37*

*P<0.01

The results of the CIRP surveys indicated in Table 2 show a similar pattern based upon indicators described in Table 1 to results for students measured within the overall first year retention rates at the WSSU as shown in Table 5. For example, the average first year African-American female retention rate between Fall 2007 and Fall 2010 is 79% compared to 75% for African-American male students for students with similar attitude and behaviors/habits toward learning who fall within the same family backgrounds and structure. Despite the fact that the first-year enrollment rate of African-American female students was more than twice the enrollment rate of African-American male students, retention rates for African-American female students remained significantly higher.

Table 5: African-American Male versus Female First Year Retention Rates, Fall 2007-Fall 2010

Year	Male Student Enrollment: Numbers for the First Year	Percent Male Student Retention Rates	Female Student Enrollment: Numbers for the First Year	Percent Female Student Retention Rates
2007	301	68.8	661	79.1
2008	467	77.3	886	78.1
2009	254	78.0	540	76.5
2010	225	76.9	465	82.2
Averages	312	75.3*	638	79*

*P<0.01
Source: http://www.northcarolina.edu/ira/ir/analytics/retgrper

The logistics regression estimates the odds of being retained or graduated in a given year with regards to each independent variable in regression, holding all other variables constant.

Results of the logistic regression for retention and graduation are reported in Table 6 in terms of the odds-ratio. If the odds-ratio is below 1, then an increase (decrease) in the independent variable would decrease (increase) the probability of being retained or graduating in four or less years. If the odds-ratio is greater than 1, an increase (decrease) in the independent variable causes the probability of being retained or graduating to increase (decrease). In Table 6, if the p-value is less than 0.05, then it indicates that the coefficient has a statistically significant impact on the probability of being retained or graduating in four or less years.

Table 6: Summary of Logistic Regression Model for Retention/Graduation Using Odds Ratio and *p*-value

	1-year	2-year	3-year	4-year	Graduation in four years
African-American Female vs. African-American Male	1.351 (0.037)	1.416 (0.014)	1.465 (0.000)	1.07 (0.000)	1.539 (0.039)
Second-generation vs. First-generation	0.767 (0.511)	1.239 (0.492)	1.279 (0.422)	1.185 (0.749)	1.513 (0.05)
Both-parent vs. Single-parent household	1.688 (0.05)	1.242 (0.68)	1.300 (0.58)	1.565 (0.12)	1.648 (0.15)

First year African-American female students are 35 percent more likely than male students to be retained. For the second, third, and fourth years, female students are 41, 46, and 7 percent more likely to be retained than male students. Female students are 54 percent more likely to graduate in four years than African-American male students.

A comparison of second-generation versus first-generation students revealed that during the first year, second generation students are 23 percent less likely than first generation students to be retained during year one, but the results are statistically insignificant since p value is greater than 0.05. However, for second, third, and fourth years, second generation students are 24, 28, and 19 percent more likely to be retained as compared to their first generation counterparts. The results also indicated that students from second generation households are 51 percent more likely to graduate in four or less years than students from single-parent households.

In comparing both-parents households vs. single-parent households, the results indicated that coming from both-parents households significantly increases the probability to be retained or to graduate in four or less years. First year students from both-parents households are 69 percent more likely to be retained than students coming from single-parent households. For the second, third, and fourth year, students from both-parents households are 25, 30, and 57 percent more likely to be retained than students from single-parent households. The results also indicated that students from both-parents households are 65-percent more likely to graduate in four or less years than students from single-parent households.

Evaluation of Results and Recommendations

Results of this study show that black female students are more serious about their studies and perform better than black male students. The findings also indicate that students who seek help in academic support programs earn higher grades than those who do not participate in such programs. The evaluations of CIRP survey results and students seeking help (SI participants) versus those not seeking help (non-SI participants) in historically difficult courses have emphasized the fact that not only do SI participants achieve higher scores (that is, they perform better) but also the gender issue has become a significant factor (that is, black female students achieve higher scores and outperform the black male students – in terms of obtaining a C or better grade). Moreover, the above figures are in the same vein with other similar studies that place emphasis on cultural and psychological factors in an attempt to thoroughly address these shortcomings and offer effective solutions (see also Rafi and Karagiannis, 2013).

Based on our analysis above, some straightforward recommendations include:

1. More attention and motivation should be given to black male students by both faculty and administrators to help them allocate more time and put more effort into their studies.
2. Black male students should seek academic support and assistance when they experience academic/educational difficulties.
3. Strategies for creating a helping environment are needed. Such academic support should be well-organized and accommodating to the needs and schedules of black male students, which means that the timing factor of this academic support is crucial.
4. Instructors should possess the necessary teaching and interpersonal skills, and should encourage students to seek help when their performance is unsatisfactory (same recommendations were also provided in Rafi and Karagiannis, 2013).

Assumptions, Limitations, and Future Research

Frequency of past behavior will not always yield consistent results leading to consistent performance if such behavior is not performed on a regular basis (Ouellette and Wood, 1998). For example, as the university forges stronger partnerships with preparatory community colleges, the effect of the Supplemental Instruction program may lessen. As the Supplemental Instruction program improves in gaining more acceptance and participation, one would expect a slight improvement in retention and graduation rates regardless of past behavior and study habits.

Some working and/or mature adult students may be less impacted by status of first generation as other more recent out of high-school students because the working adult student may be better socially prepared for the types of financial and academic commitments needed for success through their work experiences. This phenomenon is prevalent at Winston-Salem State University, so the built-in presence of specific demographics throughout the life-cycle of the research study minimizes the impact of the demographics around working and more mature students. While it is tempting to apply this study to other universities with similar demographics, differences in curricula and recruiting will undoubtedly produce different results. However, the preliminary study provides a framework for future research.

Conclusion

Several learning challenges facing African-American students enrolled in a HBCU were specified and tested in this paper. Female students' participation was higher than that of male students in the SI program, and female students were more successful in mastering the course content [Proposition #1]. On average, female students who participated in the SI sessions earned higher grades than male students [Proposition #2]. This also explains the reason behind female students earning significantly lower percentage of failing grades (DFWs) than male students as indicated in Table 4. To help better understand the reasons behind higher percent of female participation in the SI program than male students, CIRP survey was utilized. CIRP survey results indicated that female students took their studies more seriously in high school than male students.

The same trend continued when female students entered college and took their studies more seriously than male students [Proposition #1]. As a result, female students paid more visits to the SI sessions [Proposition #2]. Female students who enrolled at Winston-Salem State University had a history of allocating more time to their studies and enjoying their studies more than male students [Proposition #1]. This explains the reason behind higher retention rates of female students than the male students as mentioned in Table 6. Based on these results, WSSU and other HBCUs should specifically concentrate on increasing the retention rate of African-American male students by encouraging them to utilize academic support services [Proposition #3].

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