



Strategies for Improving the Retention of Engineering and Technology Students at Historically Black Colleges and Universities (HBCU)

Walter O. Craig, III^{a*}

^a College of Engineering, Southern University, Baton Rouge, Louisiana, USA

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ABSTRACT

Retention is a major factor in an institution's credibility and financial stability. A greater emphasis is being placed on retention and attrition in higher education in the United States. While lack of persistence behavior and withdrawal are problems with all undergraduate students, this is particularly the case for African-American students. The barriers to minority student retention continue to be: the cost of education, isolating campus environments, a lack of peer and faculty engagement, inadequate math and science preparation, heavy work schedule hours versus class preparation.

To minimize the impact of this disturbing trend of students not pursuing an engineering or technology degree, a priority must be set to generate student interest in graduation with these degrees.

The objectives of this paper are: (1) to define an effective retention program, (2) to discuss general retention strategies, (3) to identify challenges or barriers to overcome a lack of retention of engineering and technology students, (4) to discuss retention strategies used at an HBCU or Southern University (SU), and (5) to provide recommendations for improvement of retention in the College of Engineering at SU.

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1. Introduction

The retention of minority students is widely acknowledged as one of the most challenging problems in higher education. The national average retention rate of African-American students is 45% within five years as compared to 57% for white students according to the Frederick D. Patterson Institute. The retention rates for freshman African-American male students in HBCUs are lower compared to female students [1].

The literature reveals that enrollment, retention, student development, and graduation of African-American students is contingent on six factors:

1. Active recruitment
2. Flexibility of admission requirements
3. Availability of sound financial aid packages
4. Favorable institutional climate
5. Mentoring programs
6. Attitudes of the African-American student

It has been theorized that because of the history of oppression and discrimination in higher education, African-Americans have adopted coping strategies. African-Americans place a great deal of importance on social bonding and group cohesiveness. It is important to recognize HBCUs are connected to the issue of continuance in higher education for many students—in particular African-Americans. The sufficiency of data in the literature supports the contention that the HBCU environment is a useful one for African-American students. HBCUs use their normal availability of support, encouragement, and acceptance in their college environment to enhance the retention of their students [1].

African-American freshman student retention must be a priority for HBCUs. Effective strategies for reducing low attrition and achieving high retention rates must be developed, implemented, and evaluated by HBCUs to improve retention rates at their institutions. It is appropriate to acknowledge the critical role that HBCU institutions have played in higher education despite the lack of resources and funding.

The current six-year graduation rate at SU is 26.8% compared to the college of engineering rate of 28%. Such poor outcomes are mainly due to an estimated first-year attrition rate of 40%

and subsequent yearly drop-out rates of 20%. In order to be successful, new academic models that focus on student success must be developed. In light of performance funding concepts being considered by the Louisiana legislature, SU must become much more focused on the importance of not only admitting students but also having them graduate [2].

2. Rationale

According to Tinto (1993): “More students leave their college or university prior to their degree completion than stay.” Approximately 41 out of every 100 freshmen depart a higher education institution without obtaining a degree. The first year of college has been identified as the most critical for student success. It is no secret that a majority of students choose to leave college their first year of study. Most of the freshmen leave within the first two years of study. Understanding why students leave college involves a complex number of factors. Tinto’s research found that most students leave voluntarily [1].

Shrinking academic budgets focus more attention on retention while cost analysis indicates that it is more expensive to recruit a new student than to retain an enrolled one. Increasingly, student retention has been used as a measure of institutional effectiveness, with educational stakeholders and prospective students making university comparisons based on widely published retention rates [3].

Student retention is important for the following reasons [4].

- Student retention activities enhance student academic performances and lead to a more competent graduate of the university
- Enhanced student performance leads to an increase in enrollment by reducing the overall drop-out rate for the institution
- Higher student retention leads to a stabilized enrollment and greater financial stability for the institution
- Growth in the student population allows the university to strategically and selectively develop new programs and expand existing programs as deemed appropriate

Factors affecting attrition and retention rates

Factors influencing retention and attrition of engineering students at HBCUs, particularly SU, include [5]:

- Students working long hours brought on by insufficient financial aid
- Difficulty of the curriculum
- Poor academic performance
- Poor teaching styles
- Self-advisement of courses resulting in insufficient prerequisites

Top challenges and/or barriers identified by college students for effective retention goals include:

- Students are able to register for classes with few conflicts.
- Students seldom get the “run around” when seeking information.
- The institution/college shows concern for students as individuals.
- Faculty provides timely feedback about student progress in a course.
- Students are notified early in the term if they are doing poorly.
- Academic advisor is concerned about students as individuals.
- Academic advisor is knowledgeable regarding major/program requirements.
- Classes are scheduled at times convenient to students.
- There are services to help students decide upon a career.

In order to improve retention of minority students, both the unique and general challenges must be addressed [6].

3. Strategies for retention of engineering and technology students at SU

A retention program is a conceptual framework of strategies or components, operating with an administrative mindset of retention, fully mandated and supported by the dean of the College of Engineering. It is a comprehensive plan involving action steps designed to meet the needs of the student [7].

3.1 Key Strategy

Improve student achievement through enhanced advisement, tutorial, and mentoring activities.

3.1.1 Implementation activities

- Assign an academic advisor to all engineering and technology students and ensure that the advisor list is posted online and in each department.
- Maintain an advising file on each student in their department within the College of Engineering.

- Encourage engineering faculty to attend a university-sponsored workshop series on advising and mentoring to help understand the rules and regulations of the campus.
- Provide regular and structured academic advising and counseling to students.
- Record student-faculty advisement interactions.
- Advise students experiencing difficulty to attend tutorials provided by academic departments, Housing and Residence Life, and the comprehensive tutorial program provided by the Center for Student Success.
- Attend the Facilities Retention Workshop Series (study skills, time management, etc.) offered by the Center for Student Success and the University Counseling Center.
- Identify “at-risk students” based on academic performance at mid-term and develop an improvement plan in an advisor/advisee session.
- Meet with students during New Student Orientation and Welcome Week activities.
- Assist new students with their transition into the university experience with Peer Advising Leaders (PALS) in each academic department and Campus Life Mentors.
- Institute freshmen orientations as credited course requirements (for example, ENGR 120 or Freshmen Engineering I).
- Engineering organization members (IEEE, NSBE, ASME, ASCE, E-TECH) will be expected to provide tutoring and mentoring to freshmen and sophomore students.
- Funds will be requested to hire tutors for basic engineering courses and to provide need-based scholarships.
- Students in early engineering core courses will be asked to provide their contact information. Those dropping out will be contacted to determine the reasons for leaving and use that information to reduce the drop-out rate.
- Incorporate more practical application exercises with class assignments.
- Integrate a variety of instructional methods to support student learning (i.e., active learning).
- Introduce mini-design projects in first- and second-year capstone courses.
- Encourage engineering organizations to host student mixers so that new students feel welcomed and have a sense of belonging within the engineering culture.

3.2 Specific SU College of Engineering Retention Strategies

Strategies are used to increase the retention rate of first- and second-year students by providing them with academic, peer, and mentoring support to facilitate their transition into the College of Engineering.

- College orientation programs for new freshman and transfer students.
- Design competitions or a quiz bowl during Engineering Week representing the four disciplines in the college of engineering.
- During career fair week, industry recruiters come to speak to students about the importance of co-ops and internships. In addition, they describe the qualifications they seek in terms of marketable skills from the college graduate.
- Upperclassmen from the student engineering organizations (i.e., NSBE, ASME, IEEE, and E-tech Society) provide tutoring for students.

- During Homecoming, alumni are invited to speak to engineering students and stress the importance of both staying in their major and obtaining an engineering degree.
- Engage faculty in mentoring and advising of students in their curriculum.

4. Recommendations for retention

A recent study indicated a comprehensive retention program which encompasses more effective retention strategies is needed at SU. The major thrusts of the program should be to:

- Inform naïve undergraduates by effectively managing the transition of freshmen into the engineering environment.
- Assist students in acquiring sufficient financial aid obviating their need to work long hours.
- Enhance student support services to mitigate both the difficulty of the engineering curriculum and the insurmountable academic unpreparedness of freshman students [5].

Although tutoring is available to students, most students who indicated a need for tutoring did not take advantage of it. They preferred peer tutoring offered by their friends instead. Other students who had to work a great deal during the week claimed that they did not have time to attend the study sessions. It is essential that more students take advantage of the availability of tutoring. Its only value is in “its use.” The retention center for engineering students needs to be re-activated and housed in the College of Engineering.

Some engineering students were not taking advantage of an advisor in the advisement process. Academic advising (faculty advisor and mentor) is considered to be an essential component of any retention program. These students resorted to self-advising of courses for registration. Steps need to be taken to make it mandatory to contact their faculty advisors for class advisement before registration.

In addition, the College of Engineering should not be satisfied with only preparing students intellectually. There should be a high priority given to producing a well-rounded person who happens to possess the intellectual ability to be an engineer. Therefore, a comprehensive retention plan should include a component to enhance personal and professional development.

Several workshops should be organized to prepare students for the future. Students should be taught important oral and written skills to communicate effectively and also how to become

leaders in a group environment. Too often, students secure internships and must acquire these skills on the job [5].

5. Conclusion

If education is the key to securing the future of any populous, the HBCUs must find a way to ensure that African-American students are successful in completing their program of study. The philosophical basis of a policy on student retention must be the idea that each institution in higher education should make every effort to retain their students who are capable of doing satisfactory academic work. HBCUs must work towards providing students with a meaningful learning environment and to empower students to be connected to the institution by developing a sense of belonging with the student body.

Given the significance of a college degree, African-American freshman student retention must be a priority for HBCUs. Effective intervention strategies for reducing low attrition and high retention rates must be developed, implemented, and evaluated by HBCUs to change the growing rates of retention at their institution. It is appropriate to acknowledge the critical role in higher education that HBCU institutions have played despite the many obstacles in the lack of resources and funding [5].

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Walter O. Craig, III is currently an Assistant Professor in the Electronics Engineering Technology department at Southern University in Baton Rouge, LA. He earned a B.S.(in Physics, from Southern University, in 1972), an M.A.(in Physics, from the University of Texas, Austin, Texas, in 1975), and a Master of Material Science and Engineering (from North Carolina State University, in 1993). Professor Craig’s specialty is in the area of processing solid state devices and electronic materials.

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