

Strategies for improving the retention of Engineering & Technology students at Historically Black Colleges and Universities (HBCU's)

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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 the lack of persistence behavior and withdrawal are problems with undergraduate students in general, they are particularly so, 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, and heavy work schedule hours verses 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 an engineering or technology degree.

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

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 is 45% within 5 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 HBCU's are lower compared to female students [1].

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

1. Active recruitment
2. Flexibility of admission requirement
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 for retention in higher education. African Americans place a great deal of importance on social bonding and group cohesiveness. It is important to recognize HBCU's 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. HBCU's 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 HBCU's. Effective strategies for reducing low attrition and high retention rates must be developed, implemented and evaluated by HBCU's to changing the growing rates of retention at their institution. It is appropriate to acknowledge the critical role in higher education that HBCU institutions has played despite the many obstacles in the lack of resources and funding.

Current six year graduation rates at Southern University is 26.8 percent, whereas for the college of engineering the graduation rate is 28 percent. Such poor outcome is 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 concept considered to be implemented by the Louisiana legislators. Southern University must become much more focused on the importance of not only admitting students, but also on having them graduate [2].

Rationale

According to Tinto (1993), " more students leave their college or university prior to degree completion than stay", approximately 41 out of every 100 entering freshman depart 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 who 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, and 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 is based on widely-published retention rates [3].

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

- Student retention activities will enhance student academic performance and lead to a more competent graduate of the university.

- Enhanced student performance will lead to an increase in enrollment by reducing the overall dropout rate for the institution.
- Higher student retention will lead to a stabilized enrollment and greater financial stability for the institution.
- Growth in the student population would allow the University to strategically and selectively develop new programs and expand existing programs as deem appropriate

Factors affecting attrition and retention rates

Factors influencing retention and attrition of students in the college of engineering at HBCU's and in particular Southern University Baton Rouge, LA.[5].

- 1) students working long hours brought on by insufficient financial aid
- 2) difficulty of the curriculum,
- 3) poor academic performance
- 4) poor teaching styles.
- 5) self-advisement of courses resulting in insufficient prerequisites.

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

- 1) Students are able to register for classes with few conflicts
- 2) Students seldom get the “run around” when seeking information
- 3) The institution/college shows concern for students as individuals
- 4) Faculty provides timely feedback about student progress in a course.
- 5) Student notified early in the term if they are doing poorly.
- 6) Academic advisor is concerned about students as individuals
- 7) Academic advisor are knowledgeable regarding major/program requirements
- 8) Classes are scheduled at times that are convenient to the student
- 9) 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].

Strategies for retention of Engineering and Technology Students at Southern University

A retention program is a conceptual framework of strategies or components, operating with an administrative mindset of retention, fully supported and mandated 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].

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

Implementation Activities:

- Assign an academic advisor to all engineering and technology students and ensure that the advisor list is posted on-line and in each department.
- Maintain an advising file on each student in their department within the College of Engineering.
- Encourage Engineering faculty to attend Advising and Mentoring Workshop Series facilitated by the University so they understand the rules and regulations of the campus.
- Provide regular and structured academic advising and counseling to students.
- Record student-faculty advising 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.
- Facilities Retention Workshop Series through (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 a Plan of Improvement 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 (e.g. ENGR 120, Freshmen Engineering I)
- Engineering organization members (IEEE, NSBE, ASME, ASCE, E-TECH) will be expected to provide tutoring and mentorship 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 find reasons for leaving, and the information will be used to reduce drop- out rate.
- Incorporate more practical application exercises with class assignments.
- Integrate a variety of instructional methods to support student learning (ie. Active learning.
- Introduce mini-design projects in first and second year capstone courses.
- Have engineering organizations put on student mixers so new students can feel welcomed and have a sense of belonging to the engineering culture.

Specific SU College of Engineering Retention Strategies

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

- 1) College orientation program for new freshman and transfer students.
- 2) During Engineering week, design competitions or a quiz bowl is given to students representing the four disciplines in the college of engineering.

- 3) During career fair week with industry, recruiters from each company come to speak to students about the importance of co-ops and internships. In addition, what things industry is looking for in terms of marketable skills from the college graduate.
- 4) Students are tutored by upper-classmen from the student engineering organizations, ie. NSBE, ASME, IEEE, and E-tech Society.
- 5) During homecoming, Alumni are invited to speak to engineering students in their major disciplines. They tell the student about the need for obtaining an engineering degree and staying in their major.
- 6) Engage faculty in mentoring and advising of students in their curriculum.

Recommendations for Retention

A recent study indicated a comprehensive retention program which encompasses more effective retention strategies is needed at Southern University. The major thrusts of the program should be to inform naïve undergraduates by effectively managing the transition of freshmen into the engineering environment, to assist students in acquiring sufficient financial aid obviating their need to work long hours, and to enhance student support services to mitigate 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 just did not have time to attend the study sessions. It is essential that more students take advantage of the availability of tutoring. It's 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 see their faculty advisors for class advisement before registration.

In addition, the College of Engineering should not be satisfied with 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 which prepare students for the future. Students should be taught important personal skills such as how to communicate effectively both orally and in writing and how to be an effective leader in a group environment. Too often students secure internships with industry and have to acquire these skills on the job [5].

Conclusion

If education is the key to securing the future of any populous, the HBCU's must find a way to ensure 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. HBCU's must work towards providing students with a meaningful learning environment, 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 HBCU's. Effective intervention strategies for reducing low attrition and high retention rates must be developed, implemented, and evaluated by HBCU's to changing the growing rates of retention at their institution. It is appropriate to acknowledge the critical role in higher education that HBCU institutions has played despite the many obstacles in the lack of resources and funding [5].

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Biography

WALTER O. CRAIG, III is currently an Assistant Professor in the Electronics Engineering Technology department at Southern University in Baton Rouge, Louisiana. 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 Master of Material Science and Engineering(from North Carolina State University, in 1993). Professor Craig's specialty is in the area of processing of solid state devices and electronic materials.