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Historically Black Colleges And Universities: Undergraduate Research, Mentoring And The Graduate Pipeline

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The role of Historically Black Colleges and Universities (HBCUs) in educating underrepresented students, especially African Americans, is unparalleled by any other type of higher education institution. Those who have experienced these rare colleges have come to realize the unique value gained from being part of a great American institution. These institutions have been very instrumental in providing their students opportunities that have been denied to them in other arenas, including opportunities to partake in research at the undergraduate level (Hubbard, 2006). Mainstream research universities, research centers, and federal programs partnering with HBCUs provide excellent avenues for undergraduate students to be involved in the research process. Of course, numerous professors and departments take the initiative to support undergraduate research experiences (UGREs) at the HBCUs (Eagan, Sharkness, Mosqueda, & Chang, 2011). Students benefit not just from the professional knowledge they garner during UGREs but also the opportunity to be mentored by the faculty member. In addition, URGES yield tremendous value in the students' personal development which many times result in propelling them into the pipeline towards earning a doctoral degree (Upton & Tanenbaum, 2014; U.S. Commission on Civil Rights, 2010).

Birth of the HBCU and its Relevance to Research and the Academy

An HBCU is defined as “a college or university that existed before 1964 that has a historic and contemporary mission of educating African-Americans” (U.S. Commission on Civil Rights, 2010, p. 8). Contrary to their categorization as Black colleges, these institutions have never been exclusionary to any ethnicity with respect to enrollment; although, they were indeed founded to serve a population that was excluded by the dominant society's institutions (Brown & Ricard, 2007). Three universities claim to be the first Black college: Cheyney State University, Lincoln University, and Wilberforce University, all founded in 1837 prior to the Emancipation Proclamation of 1863. Today, there are over 100 Black colleges and universities situated from Michigan to Florida to Texas (U.S. Department of Education, 2014). Many of the colleges possess rich legacies of research and paved the way for the majority of African American professors.

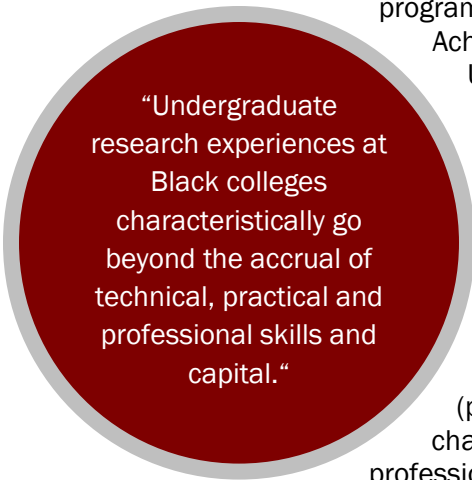
Although HBCUs have played such a significant role in research and diversifying the professoriate and the Academy (Allen & Jewell, 2002), HBCUs are currently experiencing extreme financial woes. Some HBCUs have already closed their doors while many others are considering drastic measures to keep their doors open (Dewan, 2009). Despite such challenges, these colleges continue to provide pertinent educational opportunities for thousands of African Americans and other underrepresented students. These institutions also play a critical role in the pipeline for African Americans to graduate school.

Without HBCUs, the face of the Academy would be drastically different. Hubbard (2006) claims that losing Black colleges would signify the extinction of African American professors from the Academy. HBCUs represent only 3% of all colleges and universities in the United States (Wilson, 2008) and enroll over a quarter million African Americans (NCES, 2010). Although this represents a mere 16% of all African Americans enrolled at an institution of higher education, it is extraordinary that 75% of African Americans who earn a Ph.D. receive their bachelor's degree from an HBCU (Betsey, 2009; Wilson, 2008). Czujko, Ivie and Stith (2008) state that HBCUs produce "fifty percent of the African American bachelor's degrees in physics and show similar numbers in the other sciences" (p. 1). In addition, "Spelman and Bennett colleges produce over half of the nation's Black women who go on to earn doctorates in all science fields" (Nealy, 2009, p. 19). HBCUs almost singlehandedly provide the Academy with doctoral students and African American faculty.

It is therefore vital that HBCUs continue to cultivate, support, and enhance their existing undergraduate research programs; seek avenues for the creation of new research opportunities; and reward their faculty who provide research outlets for their undergraduate population. These factors are all imperative for preserving the positive flow of African American and underrepresented students into the graduate school pipeline.

Fertile Environments for Undergraduate Research, Mentoring and Collaboration

Equipped with outstanding faculty members and driven students, HBCUs are prime environments to house UGREs. Partnering with external entities also enhances the environment in which their students can experience research. An excellent example exists at Texas Southern University's College of Science and Technology which houses TSU NASA University Research Center for Bionanotechnology and Environmental Research (TSU NASA C-BER). On smaller scales, federal grant programs such as the Ronald E. McNair Post-baccalaureate



Achievement Program and Historically Black Colleges and Universities Undergraduate Program (HBCU-UP), provide significant UGRE opportunities for students at HBCUs. Therefore, historically, empirically, and currently HBCUs are viable hubs for ongoing research and fertile ground for engaging the undergraduate student.

The Council on Undergraduate Research (2014) defines undergraduate research as an "inquiry or investigation conducted by an undergraduate student that makes an original intellectual or creative contribution to the discipline" (para. 3). Undergraduate research experiences at Black colleges characteristically go beyond the accrual of technical, practical and professional skills and capital. UGREs are crucial opportunities for faculty members to engage in mentoring situations with students and develop them socially within the academic community. Flowers (2002) theorizes that the environment at HBCUs promote increased levels of student learning and engagement because of the nurturing environment many times fostered by faculty members. Furthermore, African-American students develop cognitively and personally to a greater degree as a result of attending HBCUs according to DeSousa and Kuh (1996). The research has shown that these environments, the professors therein, and the missions and values of the institutions, all play crucial roles in the development of the African American scholar, and that research experiences and faculty mentoring are essential elements.

Faculty Mentoring

One of the most rewarding aspects of UGREs is that it provides the student an opportunity to be mentored by a faculty member. Concurrently, faculty members engaged in UGREs have the unique

forum to showcase the professoriate as a viable option for students and create opportunities to encourage doctoral level pursuits. It is indeed within the realm of the UGRE that faculty members can have the most impact on a student's life, usher them into graduate education, and mold future colleagues within their given field.

Mentoring also gives the student the avenue to be comfortable in their academic surroundings. Tinto (1993) states that students' perceptions of their integration into the college community, academic success, and persistence is closely linked with their experiences with mentoring, especially with respect to minority students. Students who feel connected with the academic community many times decide to pursue graduate education and enter the professoriate. Also, faculty mentors have the opportunity to propagate students' growth by instilling confidence within the students' own ability by providing "validating experiences and recognition" (Hurtado, Cabrera, Lin, Arellano, & Espinosa, 2009, p. 201). This also enables students to connect with course material and venture out to explore areas of interest independently, a crucial element in graduate study.

Intentional and meaningful interaction with faculty beyond the classroom is critical specifically to the retention of underrepresented students. Astin (1993) states that interacting with faculty, such as the interactions within a UGRE, increases a student's likelihood of remaining enrolled at their institution. Thus, the relationship created by faculty member through a common research activity can be the determining factor for a student's persistence through their collegiate program. It is quite possible that the mentoring aspect is the most important element of UGRES at HBCUs.

Collaborations with Neighboring Institutions

An innovative way in which HBCUs can develop research experiences for their undergraduate students is by designing and entering into research partnerships with neighboring predominantly White institutions (PWIs). When establishing a successful partnership with a neighboring PWI, there are many components to be considered: a) proximity; b) similar or complementing academic programs and offerings; c) graduate school preparation and the pipeline to the doctorate; d) faculty collaborations; e) funding.

Proximity

Proximity works in favor of these HBCU-PWI collaborations because it brings resources from multiple institutions together without cost. Many Black colleges are located extremely close to larger research institutions. For example, Fisk University, one of the preeminent HBCUs, is located less than two miles from Vanderbilt University. Close proximity allows for easier access for faculty meetings at both institutions to collaborate as well as give HBCU students easier access to facilities at the PWI.

Similar or Complementing Academic Programs and Offerings

In many instances, the neighboring PWIs are larger and have more expanded academic programs than their HBCU counterparts. These expanded academic programs usually take the form of types and number of graduate degrees offered and more extensive research agendas. This can benefit both institutions: HBCUs are granted access to the PWIs' resources and the PWI gains access to a more diverse graduate student population. For example, Fisk University and Vanderbilt University have collaborated on a nursing program. Fisk has created an undergraduate nursing program in which their students will have access to the teaching facilities at Vanderbilt's School of Nursing (Black Issues, 2004). This allows Fisk to have a nursing school for undergraduates and participate in UGRES without additional costs of hiring faculty and creating space. As a result, Vanderbilt can "attract nursing students for its graduate program from Fisk" (Black Issues, 2004, para. 3). The HBCU Digest (2013) reports that undergraduate students are exposed to research opportunities that they would not have had at their own institutions due to these cross-institutional partnerships. Thus, the HBCU-PWI collaborations can be an exciting, exploratory and innovative avenue for developing

research opportunities for undergraduate students.

Graduate School Preparation and the Pipeline to the Doctorate.

Collaborations such as the Fisk-Vanderbilt Masters-to-PhD Bridge Program have been highly successful in preparing students for graduate school and the Ph.D. The collaboration program is designed to attract specifically undergraduate students in the sciences and encourage these individuals to pursue graduate education. The program's website states that students will benefit from "[earning] a Masters degree at Fisk in physics or biology or chemistry... get valuable research experience with caring, dedicated mentors... fast-track admission to one of the participating Vanderbilt PhD programs, with full funding" (para. 4). Thus, the doctorate program at Vanderbilt provides funding opportunities through teaching and research assistantships or fellowships until the student finishes the Ph.D. (Stassum et al., 2011). Stassun, Burger and Lange (2010) posit that collaborations such as these provide necessary research and professional academic presentation opportunities for underrepresented students. PWIs benefit greatly from these programs since they can utilize these collaborations as mechanisms to recruit a well-prepared, research-experienced and diverse population of graduate students for their programs and universities. The HBCU-PWI collaboration is a positive endeavor and provides a clear and direct avenue to the doctorate for students. Having a graduate program closely related to a student's current academic activities presents the academic journey as one that is attainable and seamless.

Faculty Collaborations

HBCU-PWI collaborations can also enhance the landscape for UGRes by creating academic and professional incentives for professors. Creating cross-institutional collaboration widens the academic scope of faculty members and they may engage in research that is beyond their current agendas. Faculty members will also come to recognize the research potential and academic significance of these programs; thus, generating faculty buy-in and participation should not be a grave issue. The growth of faculty members' research agendas can increase the opportunity for UGRes.

Funding

Cross-institutional collaborations are viewed very favorably by Federal grantors and private research foundations; thus, the HBCU-PWI collaboration can provide the groundwork for developing grant writing. If acquired, these funds can be housed at either institution; however, if housed at an HBCU, the funding can assist the institution become more fiscally solvent and correspondingly justify the need for further funding of UGRes at an HBCU.

Recommendations and Call for Action of Constituents

Administrators

Administrators, which include department chairs, deans and provosts, should find ways to recognize and reward faculty who are actively engaged in UGRes. Although it may not be common practice within some universities, including faculty engagement with UGRes as a method for achieving scholarly credit in the tenure and promotion process would possibly urge many professors to become more open to offering research opportunities for undergraduate students. For example, Oregon State University (2014) includes "directing undergraduate research or projects" and "collaborating with and mentoring undergraduate students" as criterion for faculty promotion and tenure (para. 8). Also, administrators can develop ways to publicly recognize the work that professors do with their undergraduate researchers. The creation of academic awards, campus-wide news releases or featuring the research team on the university's website are simple ways in which both faculty and students can benefit and feel appreciated by their campus community for their work and efforts.

Reaching across the aisles is also important for universities if they are to develop research

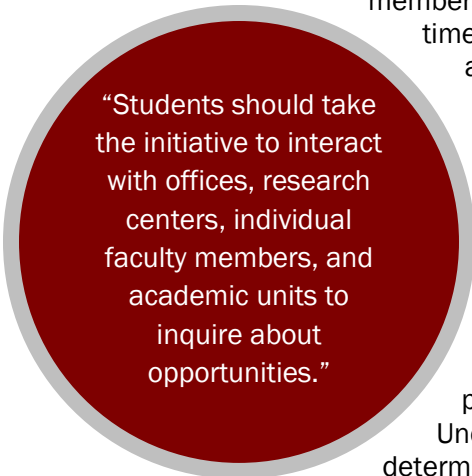
collaborations. HBCU and PWI administrations must regularly reach out to each other and explore ways which their respective institutions can collaborate. Generating inter-university understanding and trust are the outcomes of these interactions and many times are the precursor to initiatives when common ground is found by the parties. The tone and type of inter-university relationship is set many times by upper administration. If the academic communities recognize the bond, they may indeed follow suit and decide to venture into cross-campus collaborations in the classroom and the laboratories. Without the leadership, example, and support of university administration efforts in providing faculty with incentives and outlets for successful collaborations pursuing UGRE initiatives many times may be futile.

Faculty

Faculty members must also look within their own scope to initiate UGREs. Grant funding is a very important aspect of the portfolio for many faculty members and academic programs. When professors consider the development of grant proposals, they should also consider including research components for undergraduates within their framework. Express in the proposal the need for funding undergraduate students to work on specific aspects of the project; including concrete outcomes for the student and its benefit to the overall project. If the grant proposal is successful, the faculty principal investigator, academic department, undergraduates and field benefits from the endeavor.

Students

Students play a dynamic role as well when it comes to research experiences on any given campus. Students should take the initiative to interact with offices, research centers, individual faculty members, and academic units to inquire about opportunities. Many times the aforementioned entities may have knowledge of research activities occurring within or outside of their areas. They can direct students towards those opportunities or take note of future prospects for the student. The resourcefulness displayed by an inquiring student also encourages university officials to create and develop opportunities for the student. Although many students may be cash-strapped, they should be open to volunteering for a research team or on a research project. Gaining the experience and working with a professor in the field can prove to be more valuable than any amount of money. It also places the student in a positive situation if a paid position or unpremeditated funding becomes available. Undergraduate students' disposition, interest perseverance, and determination can be a major element in the increase in campus awareness for the need for UGREs.



Conclusion

In many ways, HBCUs are the silent progenitors of America's African American faculty, scientists and social leaders and significantly contribute to producing qualified educators and researchers in science, technology, engineering, and math (STEM) fields (Allen & Jewell 2002). They also provide educational opportunities to other underrepresented groups. However, HBCUs in the twenty-first century are experiencing financial difficulties and are facing closure. From an academic stand point, these closings could also mean the loss of rich histories of research and student involvement in research. Consequently, the pipeline to the doctorate and eventually the professoriate is direly threatened if HBCUs are not supported in their continued efforts to educate their students and provide vital and meaningful research experiences. Institutions such as Howard University "recently began to focus on identifying "Ph.D."-bound students and helping them go the distance" (Chew,

2004, p. 31) by targeting individuals early in their academic career and seeking opportunities to develop their skills. The development of innovative collaboration with neighboring universities, partnering with large research operations and continued funding of federal programs are avenues that can sustain UGREs at HBCUs. University administrators, deans and academic chairs should actively explore these avenues in an effort to maintain the relevancy of their academic programs. Making UGREs a central priority could possibly spawn interest within an institution's donor base and generate future funding for research projects, elevating the prestige and academic reputations of these institutions. Nonetheless, housed within these HBCUs are robust histories of scientists and professors and the promise of producing future scientist and professors. Fostering impactful undergraduate research experiences undergirded with nurturing mentor relationships and rewarding dedicated faculty members are important factors as academic units seek ways to bolster research efforts. The only result of the combined directed and tangible actions of university decision-makers, faculty members, and students to strengthen the presence of UGREs is the perpetuation of the pipeline of underrepresented students to graduate school. The existence of UGREs at HBCUs can only enhance the American Academy.

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