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Diversity of HBCUs' Institutional Human Capital: A Cross-Discipline, Longitudinal Analysis of Faculty Hiring and Placement at HBCUs

Erjia Yan[1] · Robert T. Palmer[2] · Jiangen He[3] · Chaoqun Ni[4] · Mat Kelly[1]

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Abstract

This study examines the diversity of institutional human capital at Historically Black Colleges and Universities (HBCUs) by analyzing faculty educational backgrounds using a large data set on faculty hiring and placement. The analysis includes approximately four thousand faculty members employed at 10 research-intensive R2 HBCUs between 2011 and 2020. The results reveal that the 10 R2 HBCUs primarily hired tenure-track faculty from predominantly White R1 institutions. In contrast, HBCUs hired approximately 20% of their own graduates, while less than 10% of hires came from other HBCUs. Regarding placement, about 60% of HBCU graduates sought employment at HBCUs, while only a small number found employment at R1 institutions. Notably, Howard University placed 30 graduates at R1 institutions. This downward placement pattern underscores a significant trend: most HBCU hires are from R1 institutions, while HBCU graduates primarily find employment at institutions with lower research intensity. Understanding these patterns is crucial for addressing disparities in faculty representation and supporting the growth of Black professionals in academia.

Keywords HBCU · Diversity · Faculty hiring · Graduate placement · Brain drain

✉ Erjia Yan
ey86@drexel.edu

[1] College of Computing and Informatics, Drexel University, Philadelphia, PA, USA

[2] Department of Educational Leadership and Policy Studies, Howard University, Washington, DC, USA

[3] School of Information Sciences, University of Tennessee, Knoxville, TN, USA

[4] School of Computer, Data, and Information Sciences, University of Wisconsin, Madison, WI, USA

Introduction

Historically Black Colleges and Universities (HBCUs) were established between 1837 and the passage of the Civil Rights Act of 1964 with the purpose of educating Black citizens (Gasman, 2013; Civil Rights Act, 1964). The designation of HBCUs is based on criteria outlined in the Higher Education Act of 1965, including the requirement that an HBCU's mission focuses on educating Black Americans. During the 19th and early 20th centuries, HBCUs were the only higher education institutions available to Black students and faculty, offering both valuable educational experiences and a welcoming environment (Hiatt et al., 2019). Predominantly White institutions (PWIs) severely restricted educational and employment opportunities for Black individuals during this time (Foster, 2001). As of the most recent data from the National Center for Education Statistics, there are 99 HBCUs in the U.S. and U.S. Virgin Islands, serving 289,000 students (NCES, 2022). Although HBCUs represent only 3% of U.S. higher education institutions, they play a critical role in the education and preparation of Black professionals, having educated 80% of Black federal judges, 85% of Black doctors, 75% of Black Ph.D. graduates, 46% of all Black business professionals, and 50% of Black engineers (Jackson & Nunn, 2003).

HBCUs have long prioritized diversity in faculty hiring, particularly with respect to race and religion. Initially, they had predominantly White faculty, many of whom were missionaries (Browning & Williams, 1978). In the 20th century, Black graduates—excluded from PWIs—found academic opportunities at HBCUs (Hiatt et al., 2019). In the 1930s–50s, European immigrants, including Jewish scholars fleeing persecution in Nazi Europe, found employment at HBCUs after facing discrimination at PWIs (Foster, 2001). Post-Brown v. Board, HBCUs faced competition from PWIs in retaining top Black faculty, leading to a "brain drain" (Seymore, 2005). This issue remains central for HBCUs today, as PWIs attract top Black scholars, while non-Black faculty rarely transition to HBCUs (Allen, 1991).

There is a substantial body of literature that discusses the status of HBCUs from legal, political, and economic perspectives (Allen et al., 2007; Palmer et al., 2023; Williams, 2018). Despite critiques, both supporters and detractors recognize HBCUs' significant contributions in preparing Black professionals. As HBCUs play a unique role in providing education to Black students, their elimination would result in a severe loss of educational opportunities for this population.

This paper focuses on faculty hiring and placement as critical components of HBCU human capital. Human capital, defined as the collective knowledge, skills, and expertise of faculty and staff, is a vital asset for these institutions (Luthans et al., 2004). HBCUs have a rich history of nurturing talent and providing opportunities for underserved communities, making their human capital particularly significant (Palmer & Gasman, 2008; Johnson & Jackson, 2024). This capital encompasses not only academic expertise but also cultural understanding, mentorship, and community engagement, which are essential for fostering inclusive learning environments.

Faculty hiring and placement reveals the ability of HBCUs to retain their own graduates and their impact on the broader academic labor market. By examining where HBCU graduates are placed and where HBCUs source their faculty from,

we gain insight into the institutional challenges and opportunities faced by these institutions in sustaining their human capital. HBCUs play a critical role in providing employment opportunities for Black scholars, shaping the diversity of the academic workforce, and contributing to the educational pipeline that supports the success of underrepresented groups in higher education. Investing in the development and retention of institutional human capital at HBCUs is essential for preserving their historical legacy, promoting student success, and driving innovation in higher education.

Literature Review

Hiring and Placement

Faculty placement is a form of academic mobility, focusing on graduates transitioning to new institutions ((Wu et al., 2024) in press). Early studies in this area primarily examined elite programs, but recent large-scale data collections, such as those from the Academic Analytics Research Center (AARC), have expanded the scope of research (Clauset et al., 2015; Wapman et al., 2022). Wapman et al. (2022) demonstrated a steep hierarchical structure in faculty hiring, with top-tier institutions dominating the supply of talent. This pattern perpetuates a steep hierarchy, where prestigious departments frequently hire their own graduates or graduates from similarly prestigious institutions, resulting in limited upward mobility for faculty trained at less prestigious universities. The findings highlight structural inequalities that directly impact HBCU faculty hiring and placement. HBCUs often operate outside the core network of elite institutions, which affects their ability to attract and retain top talent and increases challenges in placing their graduates in tenure-track positions at prestigious universities.

In the context of HBCUs, research shows that they trained most Black Ph.D. graduates (Jackson, 2002; Perna, 2001). However, desegregation led many Black faculty to seek employment at PWIs, resulting in a brain drain (Jackson, 2002). This issue remains a central challenge for HBCUs, as PWIs attract top Black scholars, while non-Black faculty rarely transition to HBCUs (Allen, 1991; Morris, 1972; Mommsen, 1973; Miller, 1981; El, Elmore & Blackburn, 1983). Brain drain in this context began as desegregation allowed Black students and faculty to enter PWIs where academic quality was seen as higher (Morris, 1972); it is arguably exacerbated by the fact that elite universities in the U.S. are keen to hire highly qualified Black faculty members to increase faculty diversity.

HBCU Faculty Diversity

Although HBCUs are “historically Black”, from their inception in the 19th century, they have always been open to students, faculty, and administrators of all races (Palmer & Maramba, 2015). HBCUs have a long history of valuing diversity, with some even arguing that “the only significant diversity in academic ranks

in the country exists in Black Colleges and Universities" (Noonan et al., 2013, p. 67). In their early years, HBCUs were primarily founded by White missionaries, often assisted by a small number of Black educators trained in Northern institutions (Browning & Williams, 1978; Bracey, 2017). Well into the early 20th century, HBCUs had predominantly White faculty and staff, while their student body was almost exclusively Black. It was not until the 1920s that the first Black president of an HBCU, Mordecai Wyatt Johnson, was appointed at Howard University (Foster, 2001). Over time, as more Black scholars earned advanced degrees, many were hired as faculty and administrators at HBCUs, especially as they were largely denied employment at PWIs (Hiatt et al., 2019).

During the 1930s to the 1950s, European immigrants, particularly Jewish scholars, who faced discrimination at PWIs due to their Jewish identity and suspicions of communist affiliations, found academic opportunities at HBCUs (Foster, 2001; Hiatt et al., 2019; Gasman & Nguyen, 2015). The Civil Rights Movement of the 1960s further transformed the faculty demographics at HBCUs, with "young, liberal, and idealistic" White faculty members, many of whom had participated in the movement, finding academic homes at these institutions (Foster, 2001, p. 619). This period also saw a significant influx of foreign-born scholars from the Caribbean, Africa, and parts of Asia (Hiatt et al., 2019), solidifying HBCUs' role as a beacon of faculty diversity (Gasman, 2021).

Studies have also examined the experience of White faculty as minorities at HBCUs (Closson & Henry, 2008; Foster, 2001). Some White faculty who had previously taught at PWIs had to adapt their static lecture style to a more dynamic, dialogic approach used at HBCUs (Closson & Henry, 2008). In certain cases, the hiring of White faculty led to the replacement of Black faculty at HBCUs, raising concerns about the implications for institutional identity and mission (Foster, 2001). Research has shown that some White faculty members who sought employment at HBCUs primarily viewed them as backup options, with their first preference being positions at PWIs (Foster, 2001). As a result, scholars recommend that HBCUs should "seek wider and more global markets for the educational experiences provided for students" ((Foster, 2001), p. 625), reinforcing the need for broader recruitment strategies and retention efforts that align with HBCUs' mission to serve underrepresented communities.

Research Questions

This paper addresses the issue of faculty diversity at HBCUs through an analysis of institutional profiles in faculty hiring and placement. Specifically, it aims to answer the following research questions:

1. What is the level of diversity, as measured by institutional profiles (e.g., PWI vs. HBCU, R1 vs. R2), among tenure-track faculty hired by HBCUs?
2. What is the level of diversity, as measured by institutional profiles, among Ph.D. graduates from HBCUs who secure tenure-track positions at other institutions?

3. What are the differences in institutional profiles between hiring and placing institutions at HBCUs?

The answers to these questions contribute to a broader understanding of the role HBCUs play in the academic labor market and their influence on human capital diversity in higher education. HBCU faculty hiring practices are integral to addressing broader issues of diversity, equity, and representation in higher education. HBCUs have historically been crucial for the education and development of Black professionals, including those in academia. By focusing on their faculty hiring patterns, we gain insight into how these institutions sustain their mission, retain talent, and contribute to the academic pipeline for underrepresented groups. Furthermore, HBCU faculty hiring and placement patterns illustrate broader systemic inequalities within the academic labor market.

Data and Method

According to the National Center for Education Statistics (NCES, 2022), there are currently 99 HBCUs in the U.S. and U.S. Virgin Islands. We obtained institutional profiles for these HBCUs using data from the Carnegie Classification of Institutions of Higher Education (CCIHE). Based on the Carnegie classifications (CCIHE, 2018), 11 of the 101 HBCUs are doctoral-degree granting institutions, 24 are master's-level institutions, and 66 are either associate-level or four-year institutions. Since the focus of this study is on academic job placement and faculty hiring, we limited our analysis to the 11 doctoral-degree granting HBCUs.

Collecting comprehensive data on faculty hiring and placement poses a significant challenge due to the fragmented and often incomplete nature of publicly available data. To address this gap, we utilized data from the Academic Analytics Research Center (AARC), which aggregates detailed information on higher education faculty in the United States. AARC compiles its data through a combination of manual data collection, archival extraction, and Freedom of Information Act (FOIA) requests. This dataset includes faculty information from approximately 400 higher education institutions, including all R1 and R2 institutions, as well as most master's-level institutions according to the Carnegie classification.

The AARC dataset documents the career trajectories of more than 300,000 tenured and tenure-track faculty members from 2011 to 2020. The dataset includes detailed information on faculty members' names, gender, institutional affiliations, academic ranks, publication histories, grant records, degree-granting institutions, and major academic awards. However, due to limitations in data coverage, Delaware State University was not adequately represented in the AARC dataset, reducing the number of HBCUs in our analysis to 10 doctoral-degree granting institutions (Table 1).

Using the 2018 CCIHE statistics on tenure-track faculty, we estimated that approximately 50% of tenure-track and tenured faculty across the 10 HBCUs are covered by the AARC dataset. Wherever possible, we relied on the most recent 2020

Table 1 Number of faculty and graduates of the 10 HBCUs

Institution name	No. of faculty	No. of graduates
Clark Atlanta University	316	92
Florida A&M University	783	105
Hampton University	83	16
Howard University	939	371
Jackson State University	220	67
Morgan State University	286	31
North Carolina Agricultural and Technical State University	167	26
Tennessee State University	91	33
Texas Southern University	96	27
University of Maryland Eastern Shore	206	15
Grand total	3178	783

version of the dataset. For faculty members not included in the 2020 version, we used the most recent year in which they were covered by AARC.

Table 1 provides a breakdown of the number of unique faculty members at each of the 10 HBCUs from 2011 to 2020, as well as the number of Ph.D. graduates from each institution who secured tenure-track positions at AARC-included institutions during the same period.

The AARC classifies each professor's research area based on their departmental affiliation and research output. To ensure consistency in our analysis, we categorized these research fields into eight broader domains using a taxonomy developed by Wapman et al. (2022), which allows for cross-discipline comparisons.

In addition to descriptive statistics and reporting, we also conducted a series of network analysis and visualization, employing classic network indicators including degree, closeness, and betweenness centralities (Yan & Ding, 2009) to reveal the most prominent institutions in the HBCU hiring and placement network. In this network, each node is an institution (can be either PWI or HBCU) that hired a graduate from an HBCU, or an institution (can be either PWI or HBCU) that placed a graduate to an HBCU. Two nodes were connected if they had a hiring or placement relationship, without considering the direction for simplicity of calculating network indicators. In total, 540 institutions were included, among which 1,260 unique relationships were formed.

Conceptually, degree centrality approximates how central an institution is by measuring how many institutions are connected to it. Closeness centrality measures the average topological distance of one institution to all other institutions in the network: the shorter the average distance, the more central an institution is to others. Last, betweenness centrality measures the frequency of an institution lying on the shortest paths of all other pairs of institutions' connections: the more frequently an institution is lying on the shortest paths, the more important it is to the connectivity of the entire network.

The network was finally visualized using Gephi and a modularity-based clustering algorithm (Blondel at al., 2008) was applied to the network to identify clusters of institutions based on the network structure.

Results

Placement of HBCU Graduates

In this section, we present the main findings from our analysis of faculty hiring and placement at HBCUs. First, we explore the number of HBCU graduates who successfully obtained tenure-track positions and were employed at AARC-included institutions from 2011 to 2020 (Table 2).

During the data collection period (2011–2020), a total of 13 HBCU graduates who completed their degrees between 1960 and 1969 were employed as tenure-track faculty at the 400 institutions included in the study. Among these graduates, six were employed at HBCUs, while seven were employed at PWIs. Although the number of HBCU graduates securing tenure-track faculty positions has been steadily increasing, the percentage employed at HBCUs has remained stable at around 60%. Table 3 displays the disciplinary distribution of HBCU graduates who secured tenure-track faculty positions at AARC-included institutions between 2011 and 2020.

HBCU graduates with tenure-track positions are primarily concentrated in Medicine and Health (34%), followed by Social Science (16%), Natural Sciences (12%), and Applied Sciences (12%). HBCU graduates are least represented in Math and Computing (5%) and Engineering (4%). When comparing employment at HBCUs and PWIs, it is notable that, except for Engineering, where more graduates secured positions at PWIs (69%), most graduates in all other fields found employment at HBCUs.

Table 2 Number of HBCU graduates who found tenure-track employment within the data reported by AARC

Year degree obtained	Employment at HBCU	Employment at PWI	Total number of employment	% of HBCU employment
1960–1969	6	7	13	46%
1970–1974	4	3	7	57%
1975–1979	17	8	25	68%
1980–1984	17	12	29	59%
1985–1989	30	18	48	63%
1990–1994	25	25	50	50%
1995–1999	40	26	66	61%
2000–2004	76	40	116	66%
2005–2009	83	60	143	58%
2010–2014	77	42	119	65%
2015–2019	33	25	58	57%

Table 3 Number of HBCU graduates who found tenure-track employment at different domains within the data reported by AARC

Domain	Employment at HBCU	Employment at PWI	Total number of employment	% of HBCU employment	Domain%
Applied Sciences	69	29	98	70%	12%
Education	39	25	64	61%	8%
Engineering	9	20	29	31%	4%
Humanities	46	29	75	61%	9%
Math and Computing	25	11	36	69%	5%
Medicine and Health	172	92	264	65%	34%
Natural Sciences	61	30	91	67%	12%
Social Sciences	74	52	126	59%	16%
Total	495	288	783	100%	100%

Extended lists of top suppliers and recruiters can be found in the appendix (Appendix A1). The appendix includes only those who were actively employed between 2011 and 2020. In terms of top recruiters of HBCU graduates, only two PWIs made it to the top 10: Middle Tennessee State University, with 12 hires, and George Mason University, with nine hires. Howard University and Florida A&M University stood out in the hiring market, with Howard hiring 150 HBCU graduates and Florida A&M hiring 103. The appendix provides a list of thirty-one universities that hired four or more HBCU graduates. Among them, 13 are HBCUs, which collectively hired a total of 490 graduates, accounting for 83% of the hires.

Table 4 presents the number and percentage of graduates from each HBCU who secured tenure-track positions at various types of degree institutions based on AARC data.

Table 4 Number of HBCU graduates based on types of hiring institutions

	Self-hire	R1	R2	Other HBCU	Other	Sum
Clark Atlanta University	62 (67%)	4 (4%)	12 (13%)	2 (2%)	12 (13%)	92 (100%)
Florida A&M University	81 (77%)	4 (4%)	16 (15%)	0 (%)	4 (4%)	105 (100%)
Hampton University	12 (75%)	1 (6%)	2 (13%)	1 (6%)	0 (%)	16 (100%)
Howard University	142 (37%)	30 (8%)	110 (30%)	39 (11%)	53 (14%)	371 (100%)
Jackson State University	37 (54%)	4 (6%)	21 (31%)	1 (1%)	5 (7%)	67 (100%)
Morgan State University	15 (48%)	3 (10%)	8 (26%)	0 (%)	5 (16%)	31 (100%)
North Carolina Agricultural and Technical State University	6 (23%)	3 (12%)	7 (27%)	9 (35%)	1 (4%)	26 (100%)
Tennessee State University	4 (12%)	2 (6%)	7 (21%)	17 (52%)	3 (9%)	33 (100%)
Texas Southern University	11 (41%)	1 (4%)	4 (15%)	7 (26%)	4 (15%)	27 (100%)
University of Maryland Eastern Shore	8 (53%)	1 (7%)	2 (13%)	2 (13%)	2 (13%)	15 (100%)

HBCUs' own graduates constitute a significant portion of their placement pool. For example, Howard University placed 39 graduates (11%) at other HBCUs, Tennessee State University placed 17 graduates (52%), and North Carolina A&T State University placed 9 graduates (35%) at other HBCUs. Howard University supplied 30 graduates (8%) to R1 institutions, while the remaining HBCUs provided fewer than 10 graduates each to R1 institutions. For placements at other R2 institutions (excluding HBCUs), Howard University was again notable, supplying 110 graduates (30%). Other contributors to R2 institutions included Jackson State University with 21 graduates, Florida A&M University with 16 graduates, and Clark Atlanta University with 12 graduates.

The two area charts in Fig. 1 illustrate the job placement trends of HBCU graduates between 2011 and 2020. The left chart shows the absolute number of HBCU graduates employed by institution type, while the right chart presents this data as percentages. The left chart reveals an overall increase in the number of HBCU graduates employed, particularly due to HBCU self-hires. On the other hand, the right chart normalizes the data by percentage, demonstrating that the proportion of graduates employed by different types of institutions has remained relatively stable over time, even as the absolute numbers have grown. Self-hire continues to be the primary source of employment, but R1 institutions also play a substantial role in placing HBCU graduates.

The orange bands represent self-hires at HBCUs, which is the most common destination for faculty placement among the 10 HBCUs. A previous study, based on the 1992 National Study of Postsecondary Faculty, found that 70% of Black faculty members with doctoral degrees from HBCUs worked at HBCUs, compared to only 41% of Black faculty members with doctorates from other institutions (Perna, 2001). Among the 10 HBCUs in this study, Howard University, Florida A&M University, and Jackson State University had the highest number of placements at R1 institutions. The third-largest destination for HBCU graduates was other HBCUs. Howard University had the highest number of placements in this category, followed by Clark Atlanta University and Texas Southern University. In terms of R2 placements, Howard University and Tennessee State University had the most graduates placed at R2

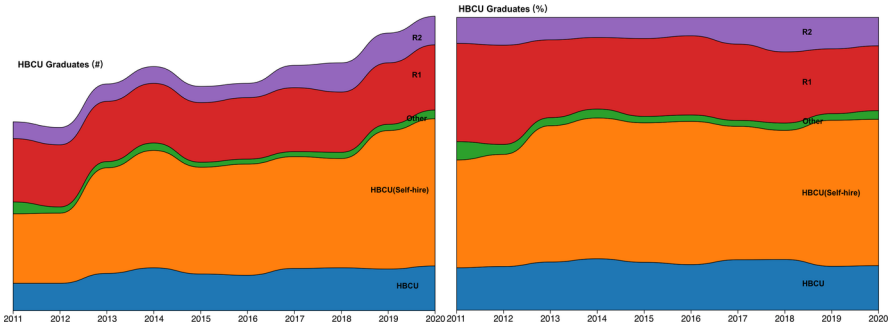

Fig. 1 Employment of HBCU Graduates by Institution Type, 2011–2020

institutions. The green bands in Fig. 2 illustrate the flow of graduates to other types of institutions, showing varying levels of representation across the 10 HBCUs.

Faculty Hiring at HBCUs

This section presents the results regarding the largest suppliers of talent to HBCUs, focusing on individuals employed between 2011 and 2020 based on AARC data. The top five universities that supplied graduates to HBCUs include three HBCUs (Howard University, Florida A&M University, and Clark Atlanta University) and two PWIs (Florida State University and University of Maryland, College Park). The appendix (Appendix A1) contains a list of 155 universities that supplied four or more graduates to HBCUs. Of these, 14 are HBCUs that collectively supplied 488 graduates (20%). When it comes to tenure-track faculty hiring, HBCUs predominantly hired their own graduates, while the majority of faculty hired from external sources came from PWIs.

Table 5 provides the number and percentage of faculty members from various types of degree institutions at each HBCU in this study.

On the hiring side, the majority of faculty at the 10 HBCUs graduated from R1 institutions, with representation ranging from 42 to 69%. HBCU self-hires also formed a significant portion of faculty hires, ranging from 4% (Tennessee State University) to 20% (Clark Atlanta University). Graduates from international institutions were also represented, with the lowest percentage being 4% at Clark Atlanta University and the highest 17% at Texas Southern University. Faculty hires from other HBCUs were less common, with the highest representation being 7% at Morgan State University.

The two area charts in Fig. 3 illustrate the hiring patterns of HBCU faculty from different institution types between 2011 and 2020. The left chart displays the total

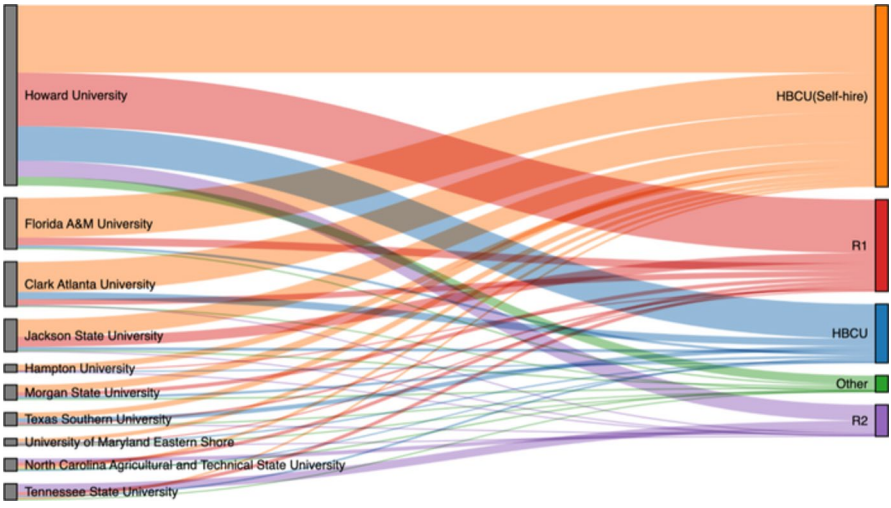

Fig. 2 Placement Network between the 10 HBCUs and Other Institutions

Table 5 Number of HBCU faculty based on types of graduating institutions

	Self-hire	R1	R2	Other HBCU	INL Institution	Other	Sum
Clark Atlanta University	62 (20%)	132 (42%)	10 (3%)	8 (3%)	14 (4%)	90 (28%)	316 (100%)
Florida A&M University	81 (10%)	497 (63%)	36 (5%)	22 (3%)	58 (7%)	89 (11%)	783 (100%)
Hampton University	12 (14%)	36 (43%)	5 (6%)	0 (%)	12 (14%)	18 (22%)	83 (100%)
Howard University	142 (15%)	542 (58%)	67 (7%)	11 (1%)	97 (10%)	80 (9%)	939 (100%)
Jackson State University	37 (17%)	133 (60%)	13 (6%)	11 (5%)	18 (8%)	8 (4%)	220 (100%)
Morgan State University	15 (5%)	183 (64%)	16 (6%)	21 (7%)	30 (10%)	21 (7%)	286 (100%)
North Carolina Agricultural and Technical State University	6 (4%)	91 (54%)	48 (29%)	2 (1%)	13 (8%)	7 (4%)	167 (100%)
Tennessee State University	4 (4%)	63 (69%)	8 (9%)	2 (2%)	6 (7%)	8 (9%)	91 (100%)
Texas Southern University	11 (11%)	49 (51%)	8 (8%)	3 (3%)	16 (17%)	9 (9%)	96 (100%)
University of Maryland Eastern Shore	8 (4%)	109 (53%)	26 (13%)	10 (5%)	20 (10%)	33 (16%)	206 (100%)

number of hires, while the right chart presents the data as percentages. The color-coded layers represent various institution types: R1 (red), R2 (purple), HBCU (blue), HBCU self-hire (orange), International (brown), and Other (green). The charts reveal that R1 institutions and HBCU self-hires are the primary source of faculty hires at HBCUs. Although the absolute number of hires from these sources has increased, their percentage relative to total hires has remained stable. International hires and hires from other types of institutions contribute to a smaller but consistent portion of the total faculty hires at HBCUs.

Figure 4 presents a visual representation of the hiring network between the 10 HBCUs and their faculty sources. The blocks on the left represent the different types of institutions that supplied faculty to the 10 HBCUs, while the blocks on the right represent the 10 HBCUs themselves. The width of the connecting bands indicates the number of graduates represented, with wider bands signifying larger numbers of hires. The color of the bands corresponds to the type of institution the faculty

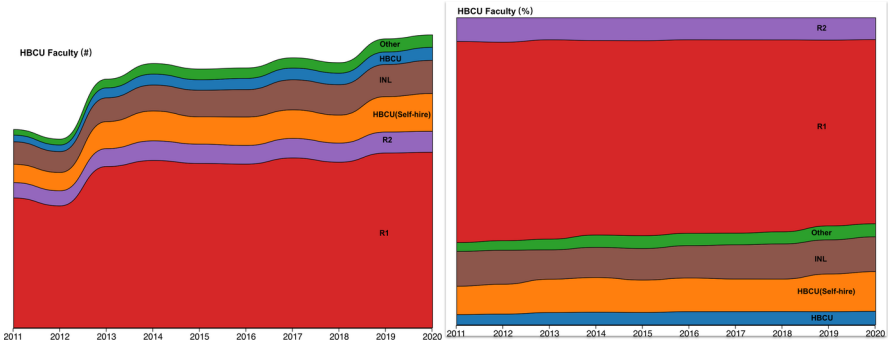

Fig. 3 HBCU Faculty Hires by Institution Type, 2011–2020

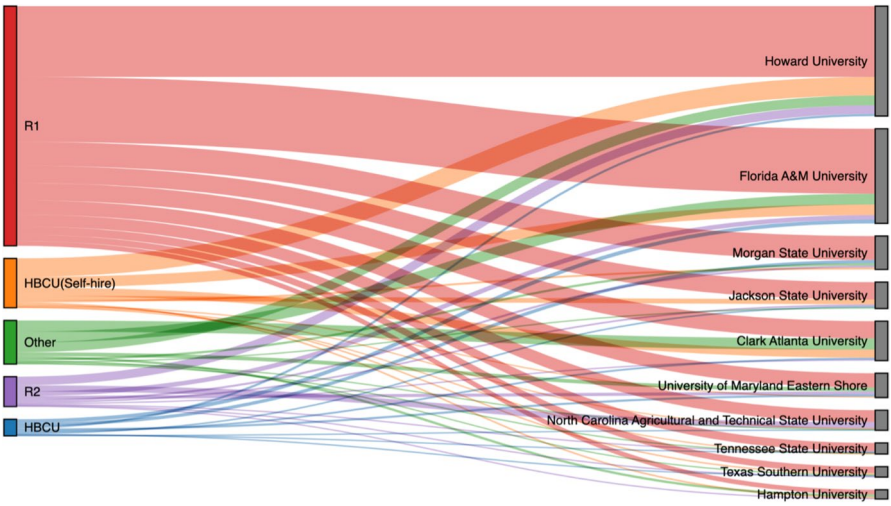

Fig. 4 Faculty Hiring Network between the 10 HBCUs and Other Institutions

members were hired from, arranged in descending order based on the number of hires.

Figure 4 shows that R1 universities (represented by red bands) were the primary source of faculty hires for all 10 HBCUs. The figure also indicates that self-hiring practices, where HBCUs hire their own graduates, were common across the institutions. This pattern aligns with previous research on self-hiring trends, particularly as evidenced by the 1990s data (Perna, 2001), represented by the orange bands in this figure. However, the extent of self-hiring varied across institutions. For example, Morgan State University, University of Maryland Eastern Shore, and Tennessee State University had fewer self-hires. Graduates from other R2 institutions (purple bands) and other HBCUs (light blue bands) also found employment at these HBCUs, although to a lesser extent than R1 hires or self-hires. The green bands, representing hires from other types of institutions, varied in their representation across the 10 HBCUs.

Hiring and Placement Network

This section reports the key results from the hiring and placement network analysis. Table 6 shows the top 15 institutions based on degree, closeness, and betweenness centralities. Full list of centrality measures for each institution can be found in Appendix A2. Figure 5 shows the network structure of the undirected hiring and placement network and its clustering patterns.

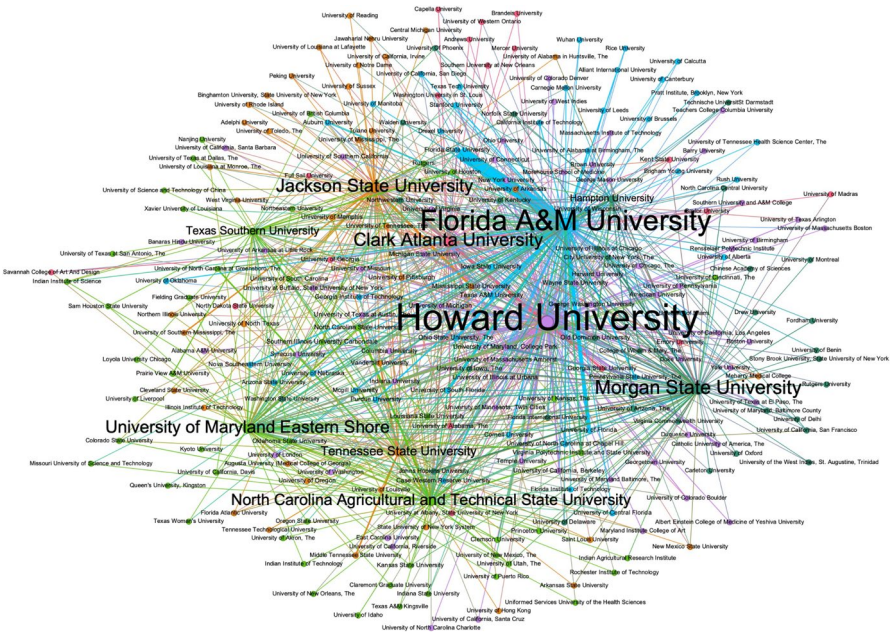

Fig. 5 visualizes the HBCU hiring and placement network among institutions. The size of each node and its label reflects the degree centrality of that institution within the network

Table 6 Top 15 institutions in the hiring and placement network based on centrality measures

Degree	Closeness	Betweenness
Howard University	Howard University	Howard University
Florida A&M University	Florida A&M University	Florida A&M University
Morgan State University	Clark Atlanta University	Morgan State University
Clark Atlanta University	Jackson State University	University of Maryland Eastern Shore
University of Maryland Eastern Shore	Morgan State University	Clark Atlanta University
Jackson State University	University of Maryland Eastern Shore	Jackson State University
North Carolina Agricultural and Technical State University	Tennessee State University	North Carolina Agricultural and Technical State University
Tennessee State University	University of Wisconsin	Texas Southern University
Texas Southern University	University of Michigan	Hampton University
Hampton University	Iowa State University	Tennessee State University
University of Wisconsin	Texas A&M University	University of Wisconsin
Texas A&M University	North Carolina State University	Texas A&M University
University of Michigan	Texas Southern University	University of Illinois Urbana-Champaign
Iowa State University	Old Dominion University	Rutgers University
University of Illinois Urbana-Champaign	University of Texas at Austin	University of Nebraska

Not surprisingly, HBCUs take top positions based on centrality measures as the network was constructed using them as the "egos". Howard University emerges as the most central institution across all three measures, indicating its significant influence and role as a hub within the hiring and placement network. This outcome is consistent with Howard's historic role as a leader in higher education, particularly among HBCUs. Florida A&M University consistently ranks second in all centrality measures. Other HBCUs such as Morgan State University, Clark Atlanta University, Jackson State University, and Texas Southern University also feature prominently in the rankings. Flagship PWIs such as University of Wisconsin, University of Michigan, Texas A&M University, and University of Illinois Urbana-Champaign are also central in the hiring and placing graduates in this network. PWIs such as Texas A&M University and University of Illinois Urbana-Champaign show higher betweenness centrality. This suggests that these institutions serve as critical bridges between distinct clusters or communities, including HBCUs and other PWIs.

Figure 5. The network structure of the undirected hiring and placement network and its clustering patterns. Figure created using Gephi. The figure only included institutions with a degree centrality higher than 2. Force Atlas layout algorithm was used to plot the network. Institutions were color coded based on one of the six clusters that one institution was clustered into based on a modularity-based algorithm (Blondel, 2008).

Howard University stands out as the most central and influential node in the network, as indicated by its large size and central position, reinforcing its critical function as a hub within the academic landscape. Other HBCUs, such as Florida A&M University, Morgan State University, Clark Atlanta University, University of Maryland Eastern Shore, Jackson State University, and Texas Southern University, also feature prominently. Their positions and sizes highlight their importance in the network, emphasizing that they serve as key connectors within the HBCU community. The presence of PWIs in this network demonstrates their engagement in hiring and placement networks.

Six clusters were identified (full list can be found in Appendix A3). Based on the cluster association, we can make the following observations: the first cluster (in purple), including HBCUs and prominent U.S. universities, form the core of the network. The second cluster (in pink) includes selective and specialized institutions, while the third cluster (in blue) includes nationally and internationally recognized research universities. The fourth cluster (in dark green) includes regional universities, and the fifth clusters (in light green) includes mid-sized institutions. Finally, the sixth cluster (in orange) includes small or regional institutions. While the association is not neatly aligned, it shows the general grouping structure in faculty hiring and placement activities.

Discussions

This study analyzed the diversity of human capital at HBCUs by examining faculty hiring and placement patterns. Using a dataset of nearly four thousand faculty members employed between 2011 and 2020, the study provided a much needed and

unique understanding of HBCU human capital diversity. Results indicated that out of the 10 R2 HBCUs analyzed, approximately half of the hires were graduates from R1 institutions, while around 20% of the hires were from their own institutions. Less than 10% of hires came from other HBCUs.

Regarding placement, approximately 60% of HBCU graduates sought employment at HBCUs. Only a small number of graduates found employment at R1 institutions, except for Howard University, which placed 30 graduates at R1 institutions. The data revealed a downward placement trend: while most hires at HBCUs were graduates from R1 institutions, HBCU graduates primarily found employment at less research-intensive institutions (R2 and others).

Institutional Diversity of HBCUs' Human Capital

HBCUs hired a significant number of graduates from R1 institutions, as well as from other PWI R2 and international institutions. This demonstrates that HBCUs serve as important importers of talent, contributing to their human capital diversity. Previous research has suggested that there is a stigma associated with HBCU hires, implying that they were unable to secure positions at PWIs or that they graduated from less prestigious institutions (Warnat, 1976; Foster, 2001). Additionally, negative attitudes have been noted among White faculty members' families and friends regarding employment at HBCUs (Smith & Borgstedt, 1985). This stigma persists into the 21st century. However, our findings suggest that HBCUs are hiring a diverse pool of graduates from elite institutions, refuting the notion that HBCUs primarily hire from less prestigious institutions.

Downward Placement of HBCU Graduates

Another significant finding of this study is the downward placement pattern of HBCU graduates. Although HBCUs hired many individuals from R1 institutions, their own graduates did not secure a significant number of positions at these elite institutions. This pattern can be explained by the fact that all 10 HBCUs analyzed in this study are classified as R2 institutions—the most research-intensive among HBCUs—but still less competitive than R1 institutions. This aligns with previous research showing that elite institutions dominate the faculty talent pool (Wapman et al., 2022). As a result, HBCUs face challenges in competing with elite R1 institutions when it comes to placing their graduates in top academic positions.

Limitations

This study is part of a larger effort to examine changes in human capital at HBCUs. Future research will include studies on faculty mobility using Internet Archive data, complemented by comprehensive surveys and in-depth interviews to understand the factors influencing faculty decisions to move or stay. However, the current study has several limitations. First, the study focuses exclusively on R2 HBCUs and relies on AARC data, which has limited coverage of faculty at these 10 HBCUs and even less

coverage for master's and baccalaureate-level HBCUs. Furthermore, the study examines only institutional profiles and does not consider factors such as race and gender. Conducting an intersectional analysis of institutional profiles, race, and gender could offer more nuanced insights into faculty hiring and placement practices at HBCUs.

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Data availability The authors confirm that the data supporting the findings of this study are available within the article and its supplementary materials. Raw data were generated at University of Wisconsin-Madison by Chaoqun Ni. Derived data supporting the findings of this study are available from the corresponding author Erjia Yan on request.

Declarations

Competing Interest Declaration Author Robert T. Palmer serves as an associate editor for *Innovative Higher Education*. The authors have no relevant financial interests to disclose.

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Erjia Yan holds a Ph.D. in Information Science from Indiana University. He currently serves as an Associate Professor in the College of Computing & Informatics at Drexel University. Yan's research primarily focuses on the dynamics of scholarly communication and the application of computational techniques to assess the impact and structure of science. His work often explores the intersection of informetrics and science of science, employing large-scale data analysis to uncover patterns within scientific publications and collaborations.

Robert T. Palmer earned his Ph.D. in Higher Education Administration from Morgan State University. Currently, Palmer serves as a Professor and Chair in the Department of Educational Leadership and Policy Studies at Howard University. His research primarily focuses on the influence of race, class, and gender on the educational outcomes and experiences of African American students in higher education settings. Palmer is widely recognized for his contributions to understanding the role of historically Black colleges and universities (HBCUs) in supporting academic success among minority students.

Jiangen He is holds a Ph.D. in Information Science from Drexel University. Currently, He serves as aassitant professor at the School of Information Sciences at University of Tennessee. His research primarily focuses on the development and application of computational methods to enhance information retrieval, data analytics, and knowledge management.

Chaoqun Ni is an Assistant Professor at the University of Wisconsin-Madison's iSchool. She earned her Ph.D. in Information Science from Indiana University. Her research primarily investigates scientific communication and collaboration patterns, along with the use and impact of scientific information. Her work contributes significantly to understanding the dynamics of scholarly communication and the development of policies to foster open science.

Mat Kelly is an Assistant Professor at Drexel University in the College of Computing and Informatics. He holds a Ph.D. in Computer Science from Old Dominion University, where his research focused on web science and digital preservation. His research interests include exploring the technical challenges and social implications of preserving the digital artifacts of our time.