

## **Exploration of Servingness across Virginia's Top Ranking HSI, HBCU, and PWI**

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## Introduction

### *Socio-political History of Virginia*

Virginia has a complex history where conservatism and progressiveness to move forward the commonwealth has often collided. Virginia is one of the oldest regions that has seen its socio-politics change from the American Revolution to being one of the central areas of succession and upholding slavery to its constituents' voting outcomes leaning more liberal (Tarter, 2007). This phenomenon of Virginia, once a region created from the displacement of Native Americans and its forefathers defending the need for Black chattel slavery, has been recognized in the modern era as "the most progressive southern state" (The Guardian, 2021). Many scholars have pointed out that this shift from Virginian's conservative to progressive socio-politics stemmed from the constituents being able to elect the first Black president of the United States (Tavernise et al., 2019). Though there is reminiscence of "the old south" with confederate flags and pro-Trump apparel, there has been a call to focus on racial and social issues from the macro level. After the public attention of Governor Northam's Blackface picture from his college years, he was challenged to make public amends and undertake an uncomfortable learning experience where he addressed his wrongful actions, learned more about anti-racism by confronting white-male privilege and worked with oppressed communities to meet their needs (Cole, 2019). As a result of this call to action in supporting the needs of Black and other underserved communities, there has been an increase in support of medical practices such as abortion and healthcare access, the elimination of the death penalty, and the implementation of stricter gun laws (Tavernise et al., 2019).

### *Virginia Today*

According to the 2020 Census, White, Black, and Hispanic residents have become the three dominant racial demographics in Virginia. The youth and young adults have reclaimed their power and are shifting the culture and politics away from far-right conservatism (Census, 2020). Each racial group experiences unique social issues that are targeted from the macro (i.e.: state-government) and meso (i.e.: high learning institutions) levels. For example, the low-socio-economic White people living within the Appalachia Mountains of Virginia traditionally come from small farming towns that are dehydrated from educational and occupational resources (Klutter, 1980). These areas remain economically disenfranchised and environmentally neglected. Virginia's higher education and health institutions acknowledge the plights of Appalachian communities and develop community-based projects embedded in their research and courses to serve and meet their needs as well as similar underserved communities (Gobbler Connect, n.d.). Similarly, institutions are embedding additional support structures for Black communities [especially along the coastal areas of Virginia] that are navigating anti-Black racism, environmental issues regarding rising sea levels, financial strain due to significant wealth gaps, and more (Kell, 2022). With a growing number of Hispanic immigrants in Virginia, institutions are recognizing the need to create more organizations and programs that celebrate and support Latin X cultures (VT Cultural and Community Centers, n.d.). Considering our positionality as engineering and computing education researchers, we are specifically interested in how the engineering and computing communities within the institutions (micro level) are

doing their part to engage and serve the communities they were intended to support as defined in Figure 1. In the context of engineering and computing education, we draw out the presence of servingness at three different types of top universities in Virginia: Hampton University, Virginia Polytechnic University, and George Mason University. The listed institutions are a Historically Black College/University (HBCU), a Predominantly White Institution (PWI), and a PWI working towards Hispanic Serving Institution (HSI) status, respectively. We will expand on our inclusion criteria in the methods section. We are interested in exploring how these universities' engineering colleges/departments (the micro level) connect the work that they do to the macro concerns of the communities they exist within. Thus, we employed a multi-source document analysis to answer the following research question:

How do engineering/computing colleges and departments conduct research in support of the institution's primary racial and ethnic groups as represented in the surrounding community?

**Figure 1:** Table of the levels of analysis in the studies of race and ethnicity

Level of Analysis	Typical Analytic Frames	Representative Features	Conflict Over
Institutional (Macro)	The racial state Institutionalized racism	State racial categorization Racialized laws (explicit or implicit) Expropriation	Group membership State resources National inclusion
Organizational (Meso)	Individual workplaces Schools Churches	Wage differentials Racialized tracking Racial segregation	Jobs, equal pay Equitable education Enforcement of anti-discrimination law
Individual Level (Micro)	Prejudice Racial attitudes Implicit bias	Stereotypes In-group favoritism	Interactions Exclusion Unequal treatment

## Positionality Statements

### *Simone Nicholson*

I, Simone Nicholson, am a Black American third generation HBCU graduate. In my family and community (Baltimore, Maryland), Black students pursuing a HBCU for higher education is a tradition. We value HBCUs to be the best higher learning institution environment where Black students have a personal evolution with their Black identity, passion developments, and connectedness with the Black community-- as this environment is one where one would have the most proximity to being in an all-Black environment within a country where Black people still have not reached racial parity. These Black institutions are where Black students begin to explore Black history in an in-depth lens, their own positionality as it pertains to the plights of the community and are taught how to use their time to serve the Black community through a tantamount of student-leadership activities and organizations. I am grateful for my time at my HBCU, I often look at the rich dynamic of HBCU education—what it offers Black students and the surrounding communities that other institutions cannot. However, as a Black feminist and a Black woman in technical engineering communities, I also can think about the areas in which HBCUs can improve in their servingness outside of patriarchal normatives. Though I recognize these normatives reflect the white supremacy that exists in society, at large. My hope is for HBCU stakeholders to not only acknowledge systemic issues but hold themselves accountable when these systemic issues show up in their learning environments so we can nurture all our

Black students and communities [including those with intersectional identities] in a way that overcomes all educational barriers.

*Morgan H. McKie*

I, Morgan H. McKie, am a first-generation Black Caribbean-American graduate student. For my family and community, going to a university was a rite of passage that exalted you to the very top of family hierarchy. In the eyes of my community, universities are places your parents dreamed you'll one day be accepted no matter the distinction of PWI, HBCU, or HSI. I never pursued education with the belief that the institution would serve me outside of providing me with the opportunity to learn my chosen discipline. Higher education was a vehicle in which I could make my family proud while pursuing my professional goals. In my undergraduate career I attended a PWI and at the graduate level I attended a HSI where both universities were geographically located in predominantly Caribbean populations. In each space my racial makeup was never the leading demographic of the institution. Thus, my personal expectations of how these universities would serve and represent me was low. Now as an administrator in educational technology, I have come to understand the inequality that the Black diaspora still faces in the American educational system. These inequalities can be circumvented by universities having a clear understand of the cultural makeup of the different racial groups to better serve its students and their surrounding communities.

*Stephanie A. Damas*

I, Stephanie A. Damas, am a first-generation Haitian American graduate student. Growing up my parents raised my siblings and I on three core values: faith, family, and education. Degrees were revered as points of pride and stature. My parents weren't aware of any college classifications, so they had no preference of HBCU, PWI, or HSI; they simply wanted all of us to go to college. I was in magnet programs throughout my K-12 public education, so I was always told I'd get into top universities which were always PWIs. I had little exposure to HBCU education and only looked to PWIs as the top educator. I attended a PWI that neighbored an HBCU and shared a college of engineering. When I became an upperclassman, I was heavily involved in university affairs as a student employee in the dean's office and as a member of many engineering organizations. In my community service, I was always in contact with the local community and aware of their needs. Most of my service to the community came from my involvement in organizations that were outside of my engineering involvement and mostly led by students from the neighboring HBCU. I have witnessed firsthand how my PWI fell short of prioritizing its role in the community. Outreach events were held every now and then, but community engagement was hardly ever a selling point in my college of engineering's recruitment. My core value of family was not stimulated at my PWI because the engineering culture was exclusive and competitive. Efforts were primarily made in developing cutting edge world or military solutions to continue to establish ourselves as one of the top institutions in the nation. Local community engagement was often led by student organizations rather than the college as a whole. I knew that my PWI needed to be more involved in the advancement of peoples in our local community, but I was consistently given reason to believe, that was simply not a priority.

## **Conceptual Framework**

In this paper, we draw on the work of Garcia (2017) to frame our study and analyze our data. Garcia sought to understand the ways in which organizational identity was portrayed at HSIs. Grounded in cultural and institutional theory, Garcia wished to focus on the organizational level because it was found to be the enactor of identity. Scholarship that has studied race and ethnicity has approached the construct from 3 levels: micro-, macro-, and meso- as defined in Figure 1 (Ray, 2019). In his analysis of existing scholarship on race and ethnicity, Ray (2019) found that neglecting the role of an organization led to a macro- and micro-level of understanding. Racialization enacts through the meso-level, positioning organizations as vehicles for reinforcing, challenging, or altering racial meanings. Building on this understanding, we view Garcia’s emergent typology for HSI organizational identity as a meso-level analysis. In this section, we aim to define Garcia’s typology for HSI organizational identity and adapt it to a micro-level construct, departments/colleges within an institution.

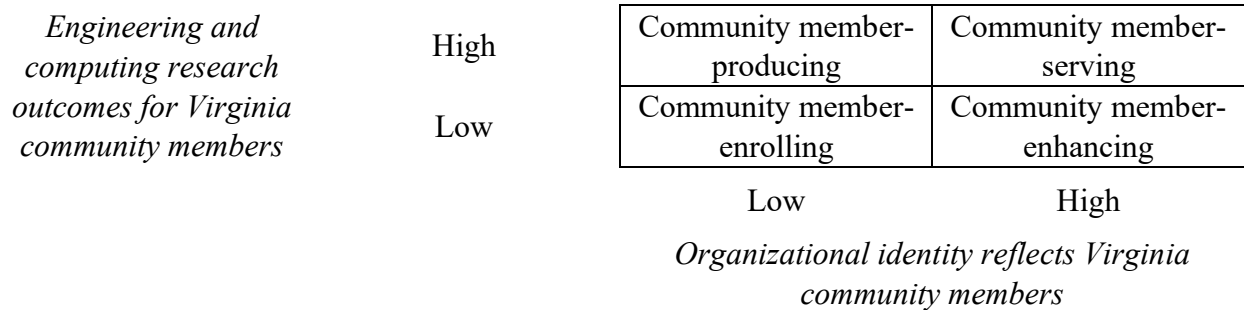
Garcia (2017) defines servingness as the extent to which a university serves a specific community. Servingness in scholarship emerged in response to federal designations of the title of HSI being given to select universities around the US dating back to 1992 (MacDonald et al., 2007) a Garcia provides a framework that universities and researchers could use to evaluate their efforts towards the Latinx community after being labeled as serving Hispanics as an HSI. Using interview and focus group data from 88 participants (administrators, students, faculty and student affairs staff) at an HSI along with documents and non-participant observations, Garcia situated four identities at the intersection of organizational culture that represented the Latinx community and organizational outcomes that enacted Latinx students: Latinx-producing, Latinx-enrolling, Latinx-serving, and Latinx-enhancing (Figure 2). Garcia’s goal was to understand how stakeholders within an HSI defined who they are as an organization and who they are as an HSI. Latinx-serving was defined by participants as the ideal university. Garcia found that six indicators characterized an institutional identity with regards to serving a specific community. Participants from the study identified graduation of Latinx students, graduate school enrollment, post-graduation employment, community engagement, positive campus climate, and support programs as indicators of a Latinx-serving identity (Garcia, 2017).

Organizational Outcomes for Latinxs	High	Latinx-Producing	Latinx-Serving
	Low	Latinx-Enrolling	Latinx-Enhancing
		Low	High
		Organizational Culture Reflects Latinxs	

**Figure 2:** Garcia’s HSI organizational identity typology (Garcia, 2017)

Garcia’s evaluative framework has been widely used to assess the efforts of HSIs as they continue to emerge across the nation. However, literature is limited in its application of servingness to other types of universities and to specific departments/colleges. Garcia’s study proved that a Latinx-serving identity includes community engagement, however, community engagement has also been found to be pivotal in STEM education across the board (Jamieson, Oakes, & Coyle, 2002; Youtie & Shapira, 2008). Youtie & Shapira (2008) highlight how modern universities have been widely known for training students for the workforce and conducting research. Significant consideration should be given to the role of the university in the advancement of the region they are located in. Thus, we extend the construct of community engagement (Garcia, 2017) to conducting research that benefits the region where a university is located.

We adapt Garcia’s Latinx-Serving typology to evaluate if the universities included in this study are serving their community by assessing their engineering and computing department’s research efforts and the organizational identity of the university. Through this adaptation we define the *y-axis as engineering and computing research outcomes for Virginia community members* and the *x-axis as organizational identity reflects Virginia community members*. We define *community member enrolling* as an institution that enrolls Black, Hispanic, and White students, has an engineering and computing department that does not produce an equitable number of research outcomes for the Virginia community, and whose institutional identity does not reflect the Virginia community. We define *community member producing* as an institution that enrolls Black, Hispanic, and White students and produces a significant number of research outcomes for the Virginia community, despite having an institutional identity that does not reflect the Virginia community. We define *community member enhancing* as an institution that enrolls Black, Hispanic, and White students, and whose organizational identity reflects Virginia community members but does not produce an equitable number of research outcomes for Virginia community members. We define *community member serving* as an institution that enrolls Black, Hispanic, and White students, has an engineering and computing department that produces an equitable number of research outcomes for the Virginia community, and whose institutional identity reflects the Virginia community.



**Figure 3:** Community servingness typology adapted from Garcia (2017)

### Research Method

To evaluate how three top universities in the Virginia Commonwealth serve the communities in which they reside, we conducted a qualitative research method called multi-source document analysis on Virginia’s top ranked HBCU, HSI and PWI within engineering and computing graduate programs. First, we identified the top universities using online ranking sources. Per Niche’s 2023 Best Colleges for Engineering in America, Virginia’s top HBCU is Hampton University and one of the top PWIs is Virginia Polytechnic University. The only HSI in Virginia is Marymount University, however, this institution was excluded from the study because it did not offer an engineering or computing graduate-level degree program. To best represent an HSI, we reviewed the demographic makeup of the top-ranked institutions to identify the ones that had a larger Hispanic population. According to Excelencia in Education, Virginia’s top institution enrolling Hispanic undergraduates is George Mason University with ~15% Hispanic students.

Through a convenient textual analysis sampling, the researchers sought to interpret these institutions’ easily accessible public records to give voice and meaning to how their organizational identities and research objectives reflect Virginia’s community memories (Bowen, 2009). Public records refer to the official, ongoing records of an organization’s activities.

Utilizing O’Leary’s planning process, the researchers first analyze documents that denote the institutional (macro-), organizational (meso-), and individual (micro-) levels of each institution. At the institutional level, the mission statement and vision of the university were evaluated. The mission, vision, and Diversity Equity and Inclusion (DEI) initiatives of the engineering and computing departments were evaluated at the organizational level. Department/college research targeting diverse populations was evaluated at the individual level. A second aspect of the research was considering how texts will be accessed, with attention to linguistic or cultural barriers. This allowed us to acknowledge biases in the text and address them. Having collected all relevant documents, we applied O’Leary’s evaluation process as follows:

1. Assessed authenticity of documents.
2. Explored document’s agenda, biases.
3. Explored background information (e.g., tone, style, purpose).
4. Asked questions about document (e.g., Who produced it? Why? When? Type of data?).
5. Explored content.

In document analysis, content is classified into thematic groups, such as in the analysis of focus groups or interview transcripts (Bowen, 2009). When reviewing the content of each document we used O’Leary’s interview technique. By treating the document like a respondent or informant we were able to gain relevant information (O’Leary, 2014). In doing so we created a type of interview protocol that allowed us to answer our research question:

RQ: How do engineering/computing colleges and departments conduct research in support of the institution's primary racial and ethnic groups as represented in the surrounding community?

The interview protocol consisted of the following questions:

1. What are the institutions and their subsequent departments overall mission? What do they value? Do they value diversity, equity, and inclusion?
2. How do the institutions and their subsequent department promote diversity, equity and inclusion?
3. What research projects center marginalized groups? What is the focus of these projects?

## **Findings**

Among our selected institutions, Virginia Tech and George Mason University hold a Carnegie classification of R1: Doctoral Universities – very high research activity, and Hampton University holds a Carnegie classification of R2: Doctoral Universities – high research activity. We present our findings in the next section by aggregating all engineering research for our R2 institution due to the limited nature of research carried out at the institution. We provide a detailed analysis of departmental research initiatives for our R1 institutions due to extensive research carried out at these institutions.

### ***Historically Black Colleges & Universities (HBCU)***

Hampton University was founded to educate emancipated Black slaves and the following generation of freedmen to meet the needs of our growing industrialized country (Virginia

Museum of History and Culture, 2022). To meet the demand of industrial needs, Black students who attend Hampton university [the meso level] are pushed to be trained in industrial sectors such as agriculture, home economics, and mechanics (USDA, 2020). Hampton University is geographically located in the eastern coastal areas of Virginia, where environmental and transportation systems are the immediate socio-economic-political macro focal points of the entire community (Hampton University School of Engineering, n.d.). Moreover, the demographic makeup where this institution is physically situated has a high concentration of Black American people. Media has pointed out that the major needs of the Black community within the Hampton area are employment and education access (Old Dominion University, 2011). These socio-economic needs of the Hampton Black community are perpendicular to Hampton University's College of Engineering and Technology's mission [the micro level] -- which is to connect students, specifically Black Americans, to hands-on engineering education that will lead to securing occupations in the civil service complex (Hampton University School of Engineering, n.d.).

Hampton University's College of Engineering and Technology makes its purpose for serving the Black community ubiquitous via public records from research initiatives to outreach. The engineering college emphasizes the importance of creating a learning experience where students are given research to practice pedagogies around environment, technology, and transportation. For example, students and faculty members have access to multiple major grants focused on impactful topics such as energy efficiency, pollution control from increased transportation systems in the Hampton roads area, and the intentional development of African American engineers through an experimental-centric curriculum (Hampton University School of Engineering, n.d.). Additionally, Hampton's College of Engineering and Technology has been in the spotlight for partnerships and technical competitions. Hampton engineering students won an aviation human factors competition where they could utilize creative insight and technical skillsets to design aviation solutions that connect to the broader issues of traveling in Virginia. Similarly, Hampton engineering and technology departments recently partnered with Amazon to expose Black students and the broader community to critical engagements with augmented reality in support of underserved communities advancing and creating their own digital worlds (Amazon, 2022). Furthermore, Hampton's college of engineering makes STEM education outreach an important focal point in giving back to the community it seeks to serve. The College of Engineering and Technology has developed K-12 engineering experiences to capture the interest of underserved students from local schools with a focus on showing these students "real world" applications of STEM and how coming to Hampton University can further their goals in becoming engineers and technologists that design for the improvement of society (Nare et al., 2016).

*"The School of Engineering and Technology is committed to insuring those higher educational opportunities in the Engineering and Technology professions are available to African Americans as well as to informing the community of significant contributions made to the profession by African Americans."*

-Hampton's School of Engineering and Technology

***Hispanic Serving Institution (HSI)***



Although George Mason University (GMU) does not have the government distinction of an HSI, it is Virginia's only four-year university with a thriving engineering department that has the largest Hispanic student population. Before forming its current identity, GMU was first established seventy-three years ago as an extension of the University of Virginia. As with many other public universities of this era, "George Mason College was conceived of, by, and for the white[s] . . . of Northern Virginia" (Richmond, 1971). The *Color of Law* references scholarship that analyzes how institutions like GMU expanded their footprints disruptively against the prevalent black community. Through gentrification practices, administrators systematically pushed out the largely black community that had resided in Fairfax County to build the university (Carton, 2022). GMU's motto of "Freedom of Learning" only referred to its white students.

Fast forward to 2022 the university's core values express that "diversity is [their] strength" (George Mason University, n.d). At the institutional level, GMU's values state that they are inclusive of a wide range of people and ideas, and they respect the differences between them in every aspect. Their mission gives the impression of a rapidly pioneering and inclusive university seeking to create a more just, free, and prosperous world (George Mason University, n.d). There has been a clear shift of perspective from the administration of the past to those now setting forth the goals of the university. This shift is revealed throughout institutional documentation. One of the top operating plan strategies of GMU's 2022-2024 Biennium Six Year Operating Plan Executive Summary is their Anti-Racism & Inclusive Excellence Initiatives. In the future, they wish to establish GMU as a national exemplar and beacon of anti-racism and inclusive excellence.

GMU offers 132 degree programs at the master's, doctoral, and professional levels, as well as more than 100 graduate-level certificates. Out of those 135 degree programs, twenty-five graduate programs focus on engineering and computing which include seventeen master's and seven Ph.D. programs. From our document analysis, we found that Volgenau School of Engineering College of Engineering and Computing (CEC) continuously endeavors to recruit, retain, and develop faculty, staff, and student talent from historically marginalized communities. At the organizational level, CEC promotes the modern innovative, and inclusive mission of the entire university.

*"The mission of the Volgenau School of Engineering is to provide a transformative learning experience that yields visionary stewards of society who are prepared to discover solutions to complex global challenges and make the world safer, cleaner, and more prosperous."*

-- College of Engineering and Computing

As of October 2021, CEC and the Office of Diversity, Outreach, and Inclusive Learning (DOIL) launched the Computing and Engineering Diversity Resource Information Center (CEDRIC) (Bushong, 2021). Alongside this center, there is an annual event called BLAST that fosters the ideas of belonging, leadership, access, success, and transformation. Within this week each day's event aligns with an idea.

CEC has 8 research centers that focus on issues ranging from healthcare, cybersecurity, artificial intelligence, and sustainability. Between all 8 centers, there is a total of 75 research projects. Each project embraces multi and trans-disciplinary technological investigation, creating an international network of scholars. Many of the projects are related to military and government operations. The *Center for Resilient and Sustainable Communities* is the only research institution that focuses on partnering with communities to build resilience with a concentration on DEI

efforts. There is no true research that centers the Hispanic population. At every level of the university Hispanic voices specifically are not uplifted.

### ***Predominantly White Institution (PWI)***

Virginia Polytechnic Institute and State University (Virginia Tech) was commissioned in 1872 as Virginia Agricultural and Mechanical College as a land grant university ("Virginia Agricultural and Mechanical College -- Its History and Organization", 1872). Virginia Tech was founded to produce a generation of educated individuals that would lead innovation and serve the local and state community. Although it established itself as a White university that provided engineering education to only men, the institution has transitioned into a multicultural serving institution over the years. Virginia Tech enrolls students from diverse demographic backgrounds. The Virginia Tech College of Engineering has grown to be the largest and most comprehensive engineering program in Virginia.

Our document analysis of the research efforts of Virginia Tech's college of engineering highlighted how the university prioritized benefits to the local community. The college of engineering houses 14 graduate research programs with seven primary research institutes. In the mission statements listed by research institutes and departments, the community was referred to as "the Virginia commonwealth," "the neighboring community," or implicitly as "the community." In some statements, it was unclear whether the community referred to the local community or the world. Thus, consideration was given to statements and initiatives that mentioned helping the world and serving society.

### ***Research Institutes***

The institutes specialize in specific areas that coincide with different research topics offered in the college. The institutes also have websites that display their missions, visions, aims, and more on home pages. We found that the institutes had a moderate to low consideration for their role in the grand scheme of benefiting the community. The primary purpose of research across most institutes is to become more competitive. The statements that mention serving the community (e.g., local, world, commonwealth, professional) are often followed by a specific mention of how they compete with cutting-edge research across the nation and worldwide. We found the location of information outlining community impact to be particularly interesting. For example, the Virginia Tech Transportation Institute highlights its theme of saving lives nationally on its home page and specifically on its "Who are We" page. This page excludes their local impact and contributions to the Department of Transportation in local and neighboring counties. They allocate space for this information in detail on a separate page secondary to the home page. The Institute for Creative Arts and Technology presented a similar separation. In their mission, they specifically mentioned outreach activities and the life sciences community and allocated a section on the home page and another in their projects tab to make note of their contribution to the Virginia commonwealth.

### ***Research Programs***

Virginia Tech houses 14 graduate research programs. We looked specifically into the information provided by the research pages linked on the Graduate Student Research page (only 12 links worked, and 1 was a duplicate page). Our primary focus was on the mission statements provided by the departments that housed the research programs, as 80% provided one. Many departments with mission statements mentioned their contribution to the local community. They referred to the community in multiple ways. They used society, the commonwealth, and the local community. A few departments focused on prioritizing their contributions to the field in their

mission statement and their dedication to their students. This can be seen in the following excerpts:

*“Through an innovative learning environment, and a hands-on approach, we fully engage undergraduate and graduate students in the learning experience. We have an ongoing dialogue between research and practice, and a commitment to continuous curriculum enhancement.”*

-- Engineering and Science Education

*“The mission of the ISE Department at Virginia Tech is to:*

*Prepare undergraduate and graduate students for life-long success and leadership in the profession, in industry, and in higher education;  
Conduct and disseminate research that advances knowledge; and  
Serve the profession, industry, and society.”*

-- Industrial and Systems Engineering

Although they do not explicitly refer to the community, we acknowledge their commitment to serving students as a step in the right direction. Nonetheless, there was significant inconsistency between the community engagement and contributions mentioned in the mission statements and the research conducted in the corresponding programs. Some departments explicitly mention serving the community in their missions:

*“Serving the citizens of Virginia, the nation, and the world by developing and transferring electrical and computer engineering knowledge that will improve the quality of people's lives.”*

-- Electrical and Computer Engineering

Yet, their research pages take a competitive approach to displaying their projects that do not align with serving the community. They highlight cutting-edge research, military contributions, and world-changing research but do not explicitly outline any connections to the local or state community. Other departments, such as the Engineering and Science Education and Computer Science departments, which do not highlight community contributions in their mission, outline explicit research goals that serve and engage the local community.

*“Build and sustain productive working relationships between CS faculty and research activities in Blacksburg and in the DC area.”*

-- Computer Science

*“Collaborating with Industry and Middle School Educators - Collaborating with local industry partners and middle-school educators to design, implement, and study recurrent engineering-focused interventions with middle school youth in rural and Appalachian regions.”*

-- Engineering and Science Education

## **Discussion**

When analyzing how Hampton serves the community that it is geographically situated in, one can conclude that servingness models HBCUs' original pursuit to provide access to high-quality post-secondary education. Hampton's engineering and technology college research, teaching practices, and outreach are aligned with the region's specific interests of building a workforce that tackles pressing issues around aviation, land transportation, environmental best practices, and more. Moreover, Hampton's faculty is intentional with ensuring that their Black students are equipped with the type of education and research needed to delineate their engineering and technical expertise to these applied interests. From this concept, Hampton

University's engineering and technology departments match macro and meso interests of the community, such as job security and access to quality education, with socio-political determinants that have been deemed important by state-level government. However, there is limited literature around what the community believes is pertinent-- meaning, for one to serve, it is beneficial to capture the voice of the community itself to contextualize what they deem their needs to be. Though one can imply through the mass media coverage of Black Live Matter's movements and continuous racist incidents across the country, that social justice is a concern of all Black communities. The College of Engineering and Technology does not specifically address in their research and teaching/learning practices how they weave social justice throughout. With a movement of STEM education being intentional with education actions incorporating social justice in marginalized students' education experiences, one cannot assume that this type of work is being done if it is not made ubiquitous. Diversity, equity, and inclusion scholars in the engineering and computing education field, such as Bix (2011), discoursed that state and institutional support for Black people's needs are more than likely tied to a political gain instead of their community needs. Though it is evident that Hampton [and other alike land grant institutions] seek to provide their Black students and communities with an exceptional education, it is still dependent on macro level determination on what is the best way to serve these communities instead of the communities shaping how they are needing to be served. With this understanding, the research concluded that when matching where Hampton's servingness would be situated on our adaptation of Garcia's servingness model, it would be closely aligned with the community-member enhancing quadrant. The College of Engineering and Technology seeks to enhance their students' ability to remain competitive and relevant within the current frontiers of STEM and the associated socio-political determinants. However, it produces a low number of research outcomes that specifically addresses needed social justice context.

GMU was a school founded during a time of great segregation. It is moving to see the transformation of this university from an oppressive system to a multicultural unit that values the work of a diverse set of individuals. These values truly permeate throughout the institutional and organizational levels, but there is no distinct research that uplifts the large Hispanic population found at GMU. This may be due in part to the diminutive size of the Hispanic population within Virginia at large. Only 9.35% of the people in Virginia are Hispanic. Diverse initiatives at the engineering college level focused on undergraduate programs that seek to enable marginalized populations to gain access to the engineering field. Yes, the marginalized population in engineering includes Hispanic individuals but also encompasses all people of color (POC). By grouping POC together GMU engineering school gets away with saying that their research is diverse while simply using the skill sets of these individuals to gain more research funding. Their research does not positively impact these specific demographics.

Mission statements are pivotal and essential to the overall running of a department. Studies have shown that mission statements, visions, and values, determine the nature of a university and highlight what they deem to be a priority (Creamer & Ghoston, 2013; Breznik & Law, 2019; Morphey & Hartley, 2006). During our analysis of Virginia Tech, we relied heavily on this identifying information. Our findings proved to us that the university, although rich in efforts to engage the community, do not prioritize highlighting said efforts in their mission statements. The notion of engaging the community, both local and state, seemed to be a subcategory rather than a leading priority. The university led the charge of community

engagement through its strategic plan to make their university more inclusive for people of all backgrounds and highlight and strengthen their impact in the local community. These sentiments are also found in the strategic plan and mission statement of the college of engineering. The objectives of research in the college do not mirror the strategic goals of the university as a whole nor the college of engineering. It is true that most R1 PWIs value their research as means for financial gain and professional distinction. If research is highly revered at the graduate and institutional level, the strategic goals should also be implemented into the efforts made. This includes engineering departments as well as centers and institutes that support departmental research. Bearing this disconnect in mind, we classify Virginia Tech's identity as community member-enhancing. We acknowledge that the university has developed an organizational identity that caters to and reflects the members of the local and state community. However, the college of engineering produces an inequitable amount of research outcomes throughout its individual departments and research centers that are indicative of the needs of local and state community members.

## **Conclusion**

We urge institutions to begin to consider their implications or impact on the community in their local area. In our study we found an array of data on research efforts but as seen in our discussion of findings, no institution quite achieved community member servingness status. The research efforts afforded at our PWIs included in the study show the privilege afforded to PWIs that is often not afforded to HBCUs. Although we present each institution individually, it is important to note that all of the institutions are geographically located in the same state and have the potential to serve all members of their local community. Nonetheless, the ability of an R1 PWI to prioritize and put forth competitive research is a concept we did not find at the HBCU in the study. Hampton University, the HBCU in our study, was primarily focused on research that partnered with significant "big-name" companies that could allow their students to receive exposure to real-life applications and access to connections and internship/job opportunities. Moreover, the research initiatives are rooted in Black STEM students being developed as civil servants, but there is an absence of research initiatives that address the continuous anti-Blackness this community faces. Virginia Tech and GMU, our PWIs, also presented research efforts that positioned the institution and programs as competitive but took secondary considerations of students' ability to serve underserved communities holistically. Seemingly, the two institutions put forth their cutting-edge research to set their students apart from other top-ranked universities. It was unclear if all students had access to the research being conducted or if the reach of the research initiatives extended to the communities that their underserved students come from.

Community engagement that adheres to communities that an institution's students identify with is an integral part of the ability of an institution's identity to be a serving one. Our adaptation of Garcia's HSI typology model is an introduction to assess servingness in contexts outside the HSI space. Moving forward, we hope to focus on one institution by taking an extensive look at its research efforts and enrollment demographics to identify if there is significant alignment with the needs of its local community. It is our hope that more universities will become more intentional in the way they serve their communities at the micro-level (discipline-specific departments) to achieve alignment with the efforts they set in place at the meso-level (university-wide strategic planning).

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