Research Manuscripts and Conference Presentations

2022 - 2023

Designing a Culturally Specific Assessment for a HBCU STEM Leadership Instrument.

Assessment design and item development practices primarily focus on the premise that cultural context should be 'decontextualized' and removed from the design. The basis of this principle, and historical knowledge of white privilege and power has resulted in assumptions about centering dominant cultural values, and the marginalization of Indigenous, Black, and Brown cultures. Although there has been a recent surge of research about the inclusion of cultural relevance and cultural sustainability in assessment item design, the processes and frameworks to implement culturally contextualized practices are only in the beginning stages of development. This research study applies a culturally specific assessment design framework to the development of a Historical Black College and University (HBCU) STEM leadership instrument. The development processes leverage the community and culture that is most impacted by the outcomes and use of the assessment instrument, including HBCU leaders and researchers; and centers cultural context related to HBCU STEM leadership expertise and effectiveness. The results illustrate a culturally specific design framework and the *Soul of Leadership* assessment instrument, with dimensions and items to assess and develop leadership capacity based on effective HBCU STEM leadership practices. This research describes the development of a framework grounded in theories of culturally responsive leadership (McClintock et al., 2021; Johnson, 2014) derived from the concept of culturally responsive pedagogy (Ladson-Billings, 1995; Gay, 2000, 2018; Vavrus, 2008) and culturally specific assessment (Sul, 2019). The developmental process of the HBCU STEM Leadership framework includes tenets of culturally responsive leadership, specifically theories, practices, and policies that create inclusive learning environments for individuals from ethnically and culturally diverse backgrounds. Its conceptualization is anchored in culturally specific assessment (Sul, 2023; Hood, 1998).

The researchers pose foundational measurement questions applicable across a wide array of research disciplines, such as: What role do sociohistorical factors play in the construction of large-scale quantitative research tools? What role do large-scale quantitative research tools play in preserving societal structures that limit the aspirations of BIPOC people? What if the voices of those assessed could be present and accounted for within large-scale quantitative research tools? How can large-scale assessment research contribute to broader cultural aspirations such as autonomy, self-determination, and liberation?

Keywords
assessment design, culturally specific assessment, item development, HBCU STEM leadership

Achieving Cultures of STEM Caring through Values-based Leadership: Voices of Faculty Leaders

This research proposal explores value-based leadership as a catalyst in cultivating cultures of caring in STEM academic units, programs and initiatives. The culture of caring in STEM education is an inter-professional collaborative effort to develop atmospheres of caring in STEM practices and environments. In the past the cultures of STEM Education have been focused on heavy-handed competitiveness and the "weeding out" of students deemed unfit (DeGrande et al., 2021). While limited in research, Christe (2013) identified that the inclusion of STEM caring cultures can provide the necessary nurturing environments that can decrease attrition and increase student success. STEM caring would also ensure the broadening of participation in STEM education.

Developing STEM caring cultures require leadership that finds values in STEM education and caring. Expanding on the CASL Soul of STEM Leadership agenda, this research will consider the significance of values-based leadership in the cultivating cultures of caring in STEM initiatives. Values-based leadership is a leadership style that is driven by shared values and beliefs. Values-based leadership (VBL) utilizes these shared values and beliefs to motivate collaborators and create "buy-in", motivational belief, acceptance, and compliance. We contend that STEM faculty leaders connect values directly and indirectly to themselves as leaders and their behaviors. We purport that VBL of STEM leaders can contribute to the enactment of necessary institutional changes within institutional priorities and structures to achieve STEM caring within university cultures, specifically STEM initiatives.

This research will explore faculty leaders VBL within the context of STEM departments at HBCU. In tandem, we contend that STEM faculty leaders have diverse perceptions of STEM values that reflect caring. Our study will develop a framework to thematically identify the necessary VBL qualities of STEM faculty leaders needed to cultivate a culture of caring. The framework will be utilized to thematically analyze the interview transcripts of STEM faculty leaders and chairs at Historically Black Colleges and Universities (HBCUs). The interviews were conducted by the Center for the Advancement of STEM Leadership (CASL). CASL is a National Science Foundation's HBCU Undergraduate Program (HBCU-UP) collaboration among the University of the Virgin Islands, Fielding Graduate University, North Carolina A & T State University, and the Association of American Colleges and Universities. The investigation conducted by CASL utilized a semi-structured interview format. The interview sessions were completed by single interviewers. Each interview session lasted between 60 to 90 minutes. The sessions were audio taped and the interviewees' responses were later transcribed. Atlas TI software will be employed for management of the data, coding, and assistance with thematic analysis. The discovered empirical evidence will provide narratives and descriptors for connecting qualities of VBL in achieving cultures of STEM caring.

Capturing the Soul of STEM Leadership:

A Framework for Advancing Leadership to Broaden Participation in STEM.

This session will highlight the efforts of the Center for the Advancement of STEM Leadership (CASL) to operationalize the Soul of HBCU STEM Leadership as an assessment framework in service to diversifying and broadening participation in STEM education leadership. The construct development process consisted of the collective coding of over 30 unique interviews resulting in over 230 unique demonstrations of traits, behaviors, practices, and environmental press (contexts) reported by HBCU executive and faculty leaders recognized for their success in broadening the participation of students of color in STEM. All demonstrated traits, behaviors, and practices were then organized into 6 macro domains. Utilizing creativity processes and facilitated discussions, the presenters will engage attendees in a discussion of an emerging framework for transforming STEM higher education leadership in service to broadening the participation of African Americans in STEM. Asset-based, rooted in African American cultural aspirations, and HBCU STEM leader-centered, the Soul of HBCU STEM Leadership framework formally defines STEM leadership derived from the voices of HBCU STEM leaders who were recognized on their campuses for their success in broadening the participation of students of color in STEM.

Keywords
culturally specific assessment, HBCU, STEM, leadership, assessment

Redressing Historical Perspectives:

HBCU STEM Academic Leadership and Roles in Broadening Participation

This symposium focuses on assessing the missing narratives of historically black colleges and universities (HBCU) leaders within the hegemonic context of STEM higher education. The symposium is an aggregate of papers from the Center for the Advancement of STEM Leadership (CASL) that used grounded theory research to capture culturally informed leadership practices. Collectively, the papers redress historical inequalities in funding HBCUs and the impact of intellectual elimination (Sul, 2021), a deliberate and functional aspect of colonialism. Presidents, provosts, and deans are responsible for broadening participation in STEM at their institutions. The collective articles redress the HBCU leaders' narratives within a historical context that marginalizes their higher education leadership toward broadening STEM participation. They collectively reveal the analysis of 15 dossiers to understand public aspects of small HBCUs' institutional contexts. The articles reveal HBCU leaders' perspectives based on their lived experiences to significantly broaden the participation of underrepresented students in STEM.

Seventh International Center for Culturally Responsive Evaluation and Assessment (CREA) Conference [Symposium]. Culturally Responsive Evaluation and Assessment. Towards Culture-Based Paradigms of Care, Chicago, Illinois. https://crea.education.illinois.edu/conferences/seventh-international-conference

Culturally Specific Assessment as Healing:

Constructing the CASL Soul of HBCU STEM Leadership Assessment Framework

This session highlights efforts of the Center for the Advancement of STEM Leadership (CASL) to operationalize the culturally specific forms of leadership exhibited by leaders at Historically Black Colleges and Universities (HBCU) in service of broadening participation in STEM. The Soul of HBCU STEM Leadership assessment framework emerged from the collective coding of over 30 unique interviews resulting in over 230 unique demonstrations of traits, behaviors, and practices, reported by HBCU executive and faculty leaders recognized for their success in broadening the participation of students of color in STEM. The result is a six-dimensional framework grounded in the voices of HBCU STEM leaders referred to as the Soul of Leadership. The presenters will engage attendees in a discussion of both the process for and the structure of the Soul of Leadership as an emerging framework for transforming STEM higher education leadership to broaden the participation of African Americans in STEM.

Keywords
culturally specific assessment, HBCU, STEM, leadership, assessment

Culturally Responsive Evaluation and Assessment. Towards Culture-Based Paradigms of Care, Chicago, Illinois. https://crea.education.illinois.edu/conferences/seventh-international-conference

Broadening Participation in STEM, Caring Intelligence as STEM Leadership Intelligence:

Perspectives of HBCU Faculty Leaders.

Within the scope of broadening participation and developing diverse talent in STEM leadership, this work delivers a research study that explores faculty leaders' caring intelligence as STEM leadership intelligence. A previously developed STEM caring oriented academic managerial leadership framework (SCAMLF) and a typology of STEM faculty leadership styles were used to thematically analyze associations between caring intelligence and leadership qualities of STEM faculty leaders. Interview transcripts of eighteen STEM faculty leaders at Historically Black Colleges and Universities (HBCUs), provided by the Center for the Advancement of STEM Leadership (CASL), were used as data in this study. Atlas TI software was employed for data management, coding, and assistance with thematic analysis. The empirical evidence gained from this study showcased important themes, narratives, and descriptors for exploring caring intelligence and leadership intelligence of STEM faculty leadership in HBCUs. Significantly, STEM caring was found to be the most common dimension present in the reflections of participating STEM faculty leaders with diverse leadership styles. Implications for future research on STEM leadership intelligence was discussed.

Keywords
STEM education, caring intelligence, leadership intelligence, caring, leadership, faculty leaders

Towards the Development of a Rubric-Based Assessment to Measure HBCU-Specific STEM Leadership.

This paper focuses on the methodology used to develop the Soul of Leadership rubric-based assessment instrument. It describes the development of a measurement scale that quantifies HBCU-specific STEM leadership. CASL researchers developed a rubric-based assessment that reflects a continuum and pathways to leadership development. Using the Polytomous Rasch Model, the HBCU culturally specific leadership assessment framework situates leaders and the assessment items along the same measurement scale (Adams et al., 1997; Masters, 1982; Rasch, 1960). Andrich (1978) developed the Polytomous Rasch model for assessment instruments with greater than two ordinal categories. The Rasch model provides a mathematical framework against which test developers can compare empirical data to assess an instrument's capacity to emulate the properties of fundamental measurement (invariance and unidimensionality) and thus serve as a tool for quantifying unobservable human conditions (Rasch, 1960). The result of the methodologies used in this research is a rubric-based assessment instrument that provides HBCU-specific institutional-level multi-year assessment data.

Keywords

Leadership Soul, HBCU-specific leadership, HBCU STEM Leaders, STEM Leadership, HBCU culturally specific assessment, measurement, rubric-based assessment

[Manuscript in preparation]

Architects and analysts:

HBCU vice presidents' and provosts' structural leadership to broaden participation in STEM.

They have never been characterized as architects and analysts, but they are. Historically Black Colleges and Universities (HBCUs) have a track record of diversifying the STEM enterprise. Despite years of creating STEM success for African American students, others, including the HBCU leaders themselves, do not characterize their leadership as architectural and analytical innovative structural leadership in service to broadening the participation of underrepresented students in STEM. Yet, juxtaposing the literature on structural leadership, it is easy to observe, based on the description of the leadership characteristics and styles, the analyst and architect in action. This research study makes visible vice presidents' and provosts' leadership decisions by applying a structural leadership frame to create student access and success. Their accounts reflect them as architects and analysts of systems designed to expand access and success of students. Findings reveal that HBCU leaders are advancing underrepresented students' success in STEM through strengthening the academic infrastructure such as restructuring STEM curricula, condensing programs, creating co-curricular programs, building interdisciplinary programs, and changing policies to focus on using indicators of students at risk of dropping out of STEM courses, for instance. Our findings suggest that HBCU vice presidents and provosts acted as analysts, with 40 percent of the 81 cases of structural leadership coded as structural leadership analysts. These leaders were tracking and using performance data to support their role as architects in establishing and supporting innovative structural leadership practices designed to move the needle on STEM recruitment, engagement, and retention of students and faculty.

Keywords

HBCUs, vice president, provost, broadening participation in STEM, STEM leadership, structural leadership, innovative structural leadership, African American student success

A Theoretical Approach

Advancing Soul as a Leadership Framework

Leadership and soul are two very common concepts which, traditionally, have not been coupled with each other, much less within the contexts of Historically Black Colleges and Universities (HBCUs) or broadening participation in Science, Technology, Engineering, and Mathematics (STEM). Soul leadership is a newer notion within leadership frameworks, and the Center for the Advancement of STEM Leadership (CASL) believes that soul and leadership are interdependent, crucial elements to success of HBCUs in broadening participation in STEM. CASL proposes that there is an unexplored branch of leadership, soul, which is found within leadership constructs at HBCUs that has yet to be illuminated. CASL posits that there is an unexplored connection or thread that exists among HBCU leaders' styles even though the institutions are not homogeneous. HBCUs differ in many ways and along many dimensions yet tend to be high producers of Black graduates within Science, Technology, Engineering, and Mathematics (STEM) fields. HBCUs' differences are both an explicit and implicit curriculum that has yet to be fully understood or investigated. CASL's goal is to uncover the soul of leadership through an extensive exploration of practices and beliefs of leaders at HBCUs. This theoretical paper will examine existing literature on soul and leadership to set the groundwork for the position that Soul Leadership is a viable leadership framework. Discourses about leadership, soul, and broadening participation in STEM are common occurrences within the perspectives of HBCUs but not found within literature as a linked phenomenon.

Keywords
CASL, Soul, Leadership, HBCUs, STEM, Broadening Participation

[Manuscript in preparation]