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Collective Transformation: Outcomes of Coaching as Part of a Leadership Development Program for STEM Fellows at Historically Black Colleges and Universities

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Coaching is an important and valuable component of leadership development programs and training for emerging leaders in science, technology, engineering, and mathematics (STEM). Based on the results from individual and focus group interviews of nine participants, we found that coaching is valuable for the leadership growth of emerging STEM leaders from nine historically Black colleges and universities (HBCUs). The participants described the outcomes from coaching as a component of value-based leadership that can inspire and motivate professional growth. They emphasized overwhelmingly that coaches were valuable in improving individual and institutional outcomes through effective leadership. Other themes that emerged from the study include coaching through modeling, inspirational motivation, intentional reflection, resourcefulness, authentic trust, and success-orientation. Results have practical and leadership implications for leadership training to broaden participation in STEM.

Keywords: *coaching for STEM leaders, coaching to broaden STEM participation, leadership coaching, coaching outcomes, academic coaching*

INTRODUCTION

Coaching is defined as the art of facilitating another person's learning, development, well-being, and performance (Rogers, 2016). According to the author, coaching and mentoring are sometimes used interchangeably, but differences exist between the two, according to the author. Mentoring is a process of developing the next generation of leaders, while coaching is a method for helping leaders to achieve expectations (Rogers, 2016). The purpose of this qualitative study was to explore the perceptions and experiences of CASL Fellows regarding the outcomes and perceived values of coaching during their leadership development training program.

Research on business coaching is replete in literature and reveals that coaching is significant in leaders' effectiveness, such as a study by Wiginton and Cartwright (2020) who found through their qualitative study that coaching builds confidence in leaders' ability to lead. Anthony (2017) conducted a qualitative study with 75 business leaders and found that leadership coaching is effective in helping leaders develop and improve their behavior and engagement with others. Kovacs and Corrie (2017) found that coaching improved executives' ability to navigate the complexity of their leadership challenges. These referenced studies were conducted in business organizations. A quantitative study that focused on STEM explored the impact of coaching teachers to implement innovations in STEM (Giamellaro & Siegel, 2018) found that coaching inspired educators to improve STEM teaching techniques. These authors also discovered that coaching improves STEM teachers' confidence level. Nardick's (2017) reflections on coaching leaders and leadership teams in higher education goes further by highlighting how the coaching, although aimed at an individual, will lead to better developed teams. He emphasizes how trust and emotional

intelligence plays a role in successful coaching those results in high-functioning teams with 'cultures of expertise' like those that are traditionally found in higher education. The findings from these studies show that coaching is important and needed for leaders in STEM (Anthony, 2017; Kovacs & Corrie, 2017; Wiginton & Cartwright, 2020). To date, there have been no research studies reported in the literature with a focus on the value or impact of coaching on emerging STEM leaders from HBCUs to enhance their ability to effectively broaden participation in STEM. The goal for this present research study was to bridge the research gap by exploring the nuances of coaching in the STEM leadership setting and discerning how the coaching interactions impact the participants and their perceived value of the coaching.

Introduction to CASL

The Center for the Advancement of STEM Leadership (CASL) is a National Science Foundation (NSF) -funded collaboration among the University of the Virgin Islands (UVI), North Carolina Agricultural and Technological University (NC A&T), Fielding Graduate University (FGU), and the Association of American Colleges & Universities (AAC&U; CASL, n. d.). CASL serves as the nation's premier intellectual and scholarship-generating resource for examining and determining the systems of leadership behaviors that broaden the participation of African Americans in STEM and meaningfully contribute to the development of the next generation of leaders who are able to advance this goal. Through a series of tightly coordinated initiatives that are grounded in the HBCU context, CASL seeks to sharpen and amplify HBCU-based discovery and innovation in broadening participation in research, while also extending the use of its core resources to produce fully vetted, HBCU-sanctioned researchers beyond those that already exist within CASL.

CASL has three objectives that uniquely build upon each other and create a cycle of transformation that continuously informs and is informed by such cycles, which are to

- enhance broadening participation research in ways that will allow for the intuitive, tacit codes of excellence in leadership that result in the broadening participation success of HBCUs to be examined, elucidated, accepted, and integrated into STEM higher education reform,
- expand classic STEM education strategies to include a world-class leadership development program that empowers a community of scholars to integrate their own unique personal and institutional histories into broadening participation research and practice, and,
- develop mainstream outreach and knowledge transfer outlets in ways that will re-appropriate the HBCU institutional narrative and assimilate it into the intellectual knowledge base that informs national undergraduate STEM reform.

BRIEF LITERATURE REVIEW

Coaching and Leadership Development

Leadership and executive coaching have become standard for many years in corporate sectors and in many sectors of government (Grant et al. , 2010). Although leaders in higher education, including those at HBCUs, face many of the same challenges as leaders in the corporate and government sectors, the use of coaching by external providers or trained peers has not demonstrated similar rates of adoption in higher education. Literature in evidence-based coaching in education tends to document the use of coaching in schools at the pre-college level (van Nieuwerburgh & Barr, 2017). Nonetheless, there is ample literature to demonstrate the potential value of coaching in the higher education and HBCU contexts, especially with respect to supporting leaders to work effectively in increasingly complex environments and to fostering leaders' resilience and well-being in adverse circumstances.

The complexity of current work environments is increasingly evident in the literature of both coaching and higher education. A complexity framework proposes that complex systems are non-linear and self-organizing, not unlike university systems. Thus, structured and predictive theories and models of leadership are insufficient for developing leaders who are capable of constructively

responding to and managing the challenges of environments in which the different parts are dynamically interrelated and patterns within the whole are in continual flux. Under these complex systems, the goals for coaching are to "cultivate conditions that allow creative solutions to emerge" (Kovacs & Corrie, 2017, p. 25). Abbott and Salomaa (2016) argued that multi-cultural and cross-cultural environments add a variable which increases the complexity of any leadership challenge. The results of Kovacs and Corrie's (2017) four-stage study confirmed that coaching supported leaders to improve their ability to navigate complex situations. Specifically, participants reported increased confidence in managing ambiguities and increased self-awareness. Overall, participants showed improved versatility as measured on a standardized instrument. Coaching was also valued as a means of providing clients with a space for reflection, perspective taking, contextualizing and information sharing.

Aspects of the Kovacs and Corrie's study were reflected in other studies of coaching impact on systems, as well as on individuals. In Stout-Rostron's (2011) view, leaders represent the social identity and purpose of a particular group and can express and live the values of authenticity, accountability, caring, and innovation. Shifting to a new paradigm of leadership, according to Stout-Rostron's (2011) respondents, has resulted in organizations adopting a learning perspective and enhancing the thinking environment, allowing for more independent, innovative, and collaborative outcomes. At the level of individual impact, Pennington's (2001) study of senior-level Black executives provides some evidence of the value of leadership coaching. Ninety percent of the study participants indicated that executive coaching had a positive impact in two areas. The first of these was providing personal support, including identifying and building on strengths and addressing developmental areas. The second of these took the form of help navigating political and cultural environments in order to succeed in meeting objectives. Minski's (2014) study demonstrated the impact of executive coaching in client's self-efficacy which, in turn, led to positive goal accomplishment. Respondents in Lawton-Smith's (2017) study indicated that coaching helped them reframe adverse events as opportunities to reassess and take control to move forward, proactively, by considering and addressing potential setbacks. A second benefit of coaching was learning to see the cultivation of resilience from a systemic perspective and to build resources to renew and support resilience in the face of adverse changes. A third finding highlighted an unexpected outcome with respondents identifying a connection between resilience and personal values and the degree to which personal values matter.

Coaching continues to be a valued component of leadership development in multiple facets of higher education. Coaching models have also become increasingly popular in medical education where physicians seek to impart individualized training. According to Deiorio and colleagues (2016), coaching provides several layers of development for medical education trainees including improved academic performance, career progression, and the fostering of self-monitoring and reflection. While coaching is demonstrably beneficial to students, it is also applicable to faculty and staff who are within leadership roles in a higher educational setting. The benefits of coaching are evident within Robison and Gray's (2017) exploration of the development of department chairs and the acquisition of important leadership skills such as active listening, setting visions and goals, and the implementation of accountability.

STEM, Higher Education and Leadership

While there is still scant documentation of leadership coaching in colleges and universities, the literature that exists suggest that university leaders can obtain similar benefits to their organizational colleagues. Bertrand (2019) notes that "leadership efficacy can be a critical factor that affects how institutions operate and improve" (p. 2). Results of this study with academic deans from diverse geographic regions and disciplines showed that coaching generated improvement in two or more of the four domains in the transformation leadership model. All participants reported a gain in empathy which, in turn, improved trust, safety, and relationship building with faculty, colleagues, and leaders up the chain of command. A second area of change was increased self-awareness, including awareness of one's own internal dialogue and the impact of such dialogue.

The final area of change was an improvement in self-care, predominantly in the female deans in the study. Bertrand concludes by encouraging deans to consider coaching as a means of increasing their overall effectiveness.

While Jackson and Joanna Bourne's (2020) study took place in the corporate sector, findings may be useful in addressing challenges faced by women in STEM programs at universities. Some diversity initiatives in STEM include the development of leadership capabilities of women. Jackson and Bourne's longitudinal mixed methods research offers evidence that coaching, delivered using a variety of online coaching modalities, facilitated behavioral changes in the young women participants. Specifically, participants reported increased goal development and self-accountability, greater use of capability affirming thoughts, and higher degrees of comfort with conflict. Overall, growth was concentrated in the areas of increased self-efficacy and self-confidence.

A systemic coaching perspective is also relevant to understanding the synergy between institutional cultures and diverse leadership efficacy. Coleman and associates, (2019) document the outcomes of efforts by the AAC&U to foster sustained improvements in the quality of undergraduate STEM education. The multiple projects undertaken by the AAC&U underscore the essential role of the academic department chair in achieving long-lasting change and improving the quality of undergraduate education. The authors emphasize the importance of systemic changes in undergraduate STEM education and the role of education leaders in ensuring sustainability and institutionalization of reform efforts. The authors also note the role of leadership in creating and maintaining the supportive and respectful environments necessary for faculty understanding and adoption of improvements in the service of increasing STEM diversity. Jones (2013) sought to understand the experience of diverse leaders within their institutional environments. Using comparative case analysis, she examined diversity leadership at three graduate programs at campus sites affiliated with the National Science Foundation's Alliance for Graduate Education and the Professoriate Program (www.nsf.gov/agep). The summary of her study results demonstrates how institutional contexts influence diversity leaders in prioritizing and implementing their strategies for increasing STEM diversity.

Coaching as a part of the CASL Leadership Fellows Program

Coaching as a part of the Leadership Fellows Program (LFP) curriculum aimed to contribute to the larger intended outcome for CASL of increasing the number of leaders ready to engage in Broadening Participation (BP) and Broadening Participation Research (BPR) initiatives. The intended outcomes for the coaching portion of the program are to

- help Leadership Fellows navigate campus politics,
- keep Leadership Fellows on track with the Leadership Learning Project (LLP) process, and
- work with Leadership Fellows on assessing and applying their 360-degree leadership assessment results.

Theoretical Framework

This research was grounded in transformational leadership. Burns (1978) defined transformational leadership as "a relationship of mutual stimulation and elevation that converts followers into leaders and may convert leaders into moral agents" (p. 4). Transformational leadership focuses on characteristics of leaders who can inspire others and foster change (Warrick, 2011). Avolio and Bass (2004) extended the research on transformational leadership style and found that such leaders recognize the needs of their subordinates and encourage the development of others to operate at levels above standard expectations. Bass (1985) added that the four factors that comprise transformational leadership are: (a) idealized influence (b) inspirational motivation, (c) intellectual stimulation, and (d) individualized consideration. *Idealized influence* refers to the charismatic nature and behaviors attributed to the leaders that enable them to engender followers' confidence, trust, respect, loyalty, and admiration. *Inspirational motivation* refers to the leaders' behaviors that motivate and inspire their followers to achieve higher goals and work towards excellence.

Intellectual stimulation refers to the transformation leaders' ability to raise their followers' awareness regarding problems and develop problem-solving abilities by encouraging innovation and creativity. *Individualized consideration* refers to the leaders' ability to treat every follower as a "whole individual" and consider their individual skills, needs, and motivations during mentoring and support. These four tenets align closely to the roles and responsibilities of coaches, which is the reason for using them in this study.

Purpose and Research Questions

The purpose of this study was to explore the perceptions and experiences of CASL Fellows regarding the outcomes and perceived values of coaching during their leadership development training program. The goal was also to use the findings to answer the two research questions that guided the focus of the study:

1. How do Fellows from HBCUs describe the value of coaching as part of the outcomes from the CASL Leadership Development Training Program to broaden participation in STEM?
2. How do Fellows from HBCUs describe their experiences with CASL coaches during their leadership development training to broaden participation in STEM?

METHOD

Research Design

A qualitative case study was used to address the research gap in the literature on the value of coaching for STEM leaders from HBCUs. The use of a qualitative research design allowed us to explore the perceptions and experiences of CASL Fellows on the outcomes and perceived values of coaching during their leadership development training program. Stake (2003) suggested that a researcher's intrigue in a specific issue is what defines the case study research, not the inquiry methods that are used. Case study serves as both a method of investigating a specific issue and the result of the investigation (Creswell & Poth, 2017; Stake, 2003). Yin (2003) provided a two-part definition for case study research: (a) an empirical inquiry that seeks to develop a contextual understanding to a real-world situation; and (b) a method that incorporates multiple data collecting strategies and triangulates data during the analysis phase. Therefore, a qualitative case study was the best research design for this study.

Study Context: CASL Leadership Fellows Program

CASL is developing and implementing a comprehensive approach to research, education, and outreach to broaden participation in STEM that posits leadership as critical to significantly impacting underrepresented groups (URGs) STEM student achievement. This approach authentically and holistically considers the lived experiences of URGs in empowering leaders to envision, inspire, and transform institutional climates to achieve maximal *inclusive excellence* in the STEM disciplines. Inclusive excellence refers to the facilitation of diverse perspectives that provide better reactions to complicated issues (Doscher & Landorf, 2018).

The CASL LFP is implemented by CASL's education team. Within CASL, the education team is charged with expanding classic STEM education strategies to include a leadership development program that seeks to empower a community of scholars to integrate their own unique personal and institutional histories into broadening participation research and practice. The 12-month CASL LFP includes in-person or virtual residencies, and live webinars, which are delivered and recorded via Zoom and shared, along with supplemental materials through the electronic learning platform, Moodle. At the start of the LFP, CASL Fellows engage in a 360-degree assessment of their leadership strengths and challenges. Fellows are then assigned a leadership coach to assist with applying assessment results, as well as strategies and skills learned during the program, to their work as leaders. The LFP curriculum is continuously evolving, informed by Bolman and Gallos'

Four Frames of Academic Leadership (Bolman & Gallos, 2011; Gallos & Bolman, 2021), ongoing research findings from CASL's research team, and extensive evaluation data collected through pre-to-post surveys and post-event feedback.

The LFP was piloted during the 2017-18 academic year with 16 Leadership Fellows nominated by administrators at their respective CASL affiliate institutions. During the 2018-19 academic year, CASL LFP hosted its first post-pilot cohort of 12 new CASL affiliate institutions. The Fellows were required to attend four residencies, three face-to-face and a virtual one due to COVID-19 pandemic. These face-to-face residencies took place in Washington, DC, Greensboro, North Carolina, and Atlanta, Georgia. The Fellows were exposed to various training topics that included:

- the legacy and future of HBCUs and framing leadership to broaden participation in STEM,
- the importance of sustaining STEM HBCU leaders,
- the role of health and wellness in sustaining leadership in broadening participation in STEM,
- sustaining health and vitality as an academic leader,
- leading change,
- leading from the middle,
- managing difficult people, and many others.

Four leadership coaches were provided by CASL for this cohort of Leadership Fellows. The coaches were all African Americans with equal numbers of males and females. They were all certified in evidence-based coaching and experienced leaders in STEM fields. Each coach worked with two to four Fellows based on background and interest variables. Coaches conducted face-to-face meetings at the residencies as well as virtual coaching sessions with Fellows in groups and individually. They attended three residencies where they conducted multiple meetings with their assigned Fellows. The Coaches were STEM leaders in higher education with knowledge of the history and legacy of HBCUs.

PARTICIPANTS

The participants for this study were purposefully selected. Nine (9) Fellows out of twelve (12) who attended the CASL LFP during the 2018-2019 academic year participated in individual or focus group interviews. All the participants met inclusionary criteria for this study: completion of the CASL LFP, current employment at an HBCU, and in a STEM field. The majority (78%) of the participants have extensive leadership experience spanning more than 10 years. Their leadership positions ranged from provost, department chair, program director, to assistant professor. One participant who was an assistant professor had an informal leadership position (STEM program director) that qualified the participant to be selected as a CASL Fellow. All the participants have terminal degrees in their respective STEM disciplines. The participants came from both private and public HBCUs from across the country. Demographic characteristics of participants are presented in Table 1. As indicated in Table 1, about 75% of the participants were male and 88% were African Americans. To maintain the highest level of confidentiality for the participants, codes were used. As part of CASL Leadership Development Program, four qualified and certified Coaches were matched with three to four Fellows. Coaches conducted face-to-face, as well as virtual coaching sessions, with Fellows in groups and individually. The Coaches were experienced leaders in STEM with knowledge of the history and legacy of HBCUs.

DATA COLLECTION PROCEDURES

Prior to the data collection, the researchers obtained IRB approval for the study from North Carolina A&T State University and emailed prospective participants to obtain their consent to participate in the study. Fellows who signed and returned consent forms were selected for the study. Data include pilot, individual, and focus group interviews, notes from interviewers, and reflections from coaches' documents following each contracted interaction with a Fellow or groups of Fellows. Elements from different sources allow the data to be triangulated to create a rich picture of the Fellows' coaching experiences. The interview protocol was developed by the researchers and

refined based on feedback from three pilot interviews. All interviews were conducted using Zoom; and the audio data were transcribed through Otter. ai software (https://otter.ai) and reviewed for accuracy. Transcribed data were uploaded to Nvivo software for coding (https://www.qsrinternational.com/nvivo-qualitative-data-analysis-software/). One focus group interview was conducted with four participants, and it lasted for 120 minutes. Each individual interview lasted between 60–95 minutes. Additional sources of data include post-session documented reflections from each of the four coaches, as well as program curriculum.

Table 1

Participants' Demographics from Data

	Demographic		
Pseudonym	**Gender**	**Race**	**Institutional Classification**
CASL-F1	Female	African American	Private
CASL-F2	Female	Asian American	Public
CASL-F3	Male	African American	Private
CASL-F4	Male	African American	Public
CASL-F5	Male	African American	Private
CASL-F6	Male	African American	Private
CASL-F7	Male	African American	Private
CASL-F8	Male	African American	Private
CASL-F9	Male	Asian American	Public

Data Analysis

Data transcripts from pilot, individual, and focus group interviews were coded in the qualitative analysis program, Nvivo. Open-coding approaches were used to explore the data (Saldaña, 2015). According to Saldaña, open-coding processes can range in magnitude from a single word to a full sentence to an entire page of text to a stream of moving images. Themes that emerged were identified and reported. Notes from interviewers were reviewed, analyzed, and reported.

Credibility and Trustworthiness

To establish rigor within the research, the researchers engaged in data triangulation, reflexivity, internal reliability, and member checking as validation strategies. In this study, a three-pronged triangulation process was employed to establish credibility and trustworthiness. Data were collected through a pilot study, semi-structured individual interviews, a focus group discussion, reflections from coaches, and memoing. According to Creswell and Poth (2017), gathering thick, descriptive data from different sources is critical in maintaining rigor and credibility for the study.

RESULTS

Seven themes emerged from the study, which include value of coaching, coaching through modeling, inspirational motivation, intentional reflection, resourcefulness, authentic trust, and success-orientation. These themes are summarized in Table 2 and aligned with the research questions.

Table 2

Alignment of Themes to Research Questions from Data

Research Question	Themes
1. How do Fellows from HBCUs describe the value of coaching as part of the outcomes from the CASL Leadership Development Training Program?	• Value-based coaching • Inspirational motivation • Resourcefulness • Success-orientation • Intentional reflection
2. How do Fellows from HBCUs describe their experiences with CASL coaches during their leadership development training?	• Authentic trust • Inspirational motivation • Resourcefulness • Success-orientation • Value-based coaching • Coaching through modeling

Theme 1: Value of Coaching

The participants in this study described their experiences with coaching in many ways. Words used vary from valuable, critically important, very valuable, highly valuable, extremely valued, to value-loaded, and value of coaching. As CASL-F5 explained,

> I found coaching to be the most valuable piece of my experience with CASL training. I must say that this is my first leadership development training and my first experience with a coach; and I was so impressed with the value of coaching that I hired one to guide me as I transition in my leadership growth. I believe that the value of a coach is immeasurable; and I know that it is what I call value-loaded **(CASL-F5, 2021).**

Other participants echoed the sentiment and emphasized that coaching was very instrumental to their leadership growth and development. Others cited coaching as the most important aspect of CASL training to broaden participation in STEM.

Theme 2: Coaching through Modeling

We found that coaches modeled appropriate behavior for Fellows. As one Fellow eloquently stated, "I can say that the coaches are deeply committed to their roles and responsibilities and are connected to the mission of HBCU and that they model what they are preaching." This sentiment is echoed by other Fellows with whom the coaches engaged in a highly professional way that exhumed the best leadership model. As CASL-F3 explained,

> The coaches were highly skilled and knowledgeable and they modeled CASL leadership in a way that you don't just see it, but you can also feel it. This is my first experience with a coach; and I was amazed at the way they modeled leadership that broaden participation in STEM because they are from the discipline **(CASL-F3, 2021).**

Theme 3: Inspirational Motivation

The theme of inspirational motivation was cited by all the Fellows in the study. They were inspired and motivated to be the best STEM leader on their respective campus. "I get frustrated easily when

I cannot figure things out, but my coach challenged my decision-making skills which inspired me to take a different approach in my leadership (CASL-F5, 2021)." CASL-F6 emphatically stated,

> My coach asked tough questions to direct my thought process. My name for her is nothing but an "inspirational motivator with the soul." She is so passionate about her coaching, and she inspires me to think beyond my role as a professor and the impact of my leadership on others. She has an impact on my desire to serve as a mentor to others **(CASL-F6, 2021)**.

Theme 4: Intentional Reflection

The Fellows discussed how their coaches helped them to participate in daily intentional reflection on an array of perspectives. "The coaches held us accountable daily. It was a sled-guided, intentional-reflection that was not intrusive," explained one Fellow. Another Fellow mentioned that their coach was very good in getting her to think at a different level. CASL-F7 passionately said that,

> The coaches were instrumental in directing my daily reflection practices that I utilize in my leadership role. It is very helpful to reflect on your goals, accomplishments, and celebrations to learn how you can improve on your practices. This is what I call leadership **(CASL-F7, 2021)**.

Theme 5: Resourcefulness

The Fellows perceived that their coaches were highly resourceful leaders. Coaches were able to direct them to a multitude of resources that are useful in broadening participation in STEM. As one Fellow stated, "My coach directed me to other programs that I can partner with in funding as well as towards different funding sources that I have never considered. She was always willing to show me new and better ways of doing my job especially with COVID-19." CASL-F8 also indicated that,

> CASL Leadership Team did an excellent job in selecting the most resourceful coaches for us. My coach is an experienced STEM leader with knowledge about broadening participation in STEM. He is an innovative STEM leader, and he has guided and directed me successfully with other institutional partners. He has continued to help me by directing me to other resources. . . **(CASL-F8, 2021).**

Theme 6: Authentic Trust

Authentic trust was another theme that emerged from all of the Fellows. They felt that their coaches exuded integrity, reliability, and trust. They reported that they felt comfortable sharing personal issues with their coaches. CASL-F4 explains,

> I have observed that my colleagues and I felt comfortable with our coaches; that we have developed an authentic trust with them. We were able to share confidential information with them about our experiences in the program, as well as our leadership challenges at our campuses. I value this aspect of our coaching relationship because it is difficult for me to develop a trusting relationship with others, but I was able to do so with my coach **(CASL-F4, 2021).**

Theme 7: Success Orientation

We found this theme across all Fellows. They felt that their coaches were focused on their leadership success. One Fellow stated that her coach cared so much about her level of confidence that she kept in touch with her when the training was completed, and she admitted that her level of self-confidence improved because of her coach. CASL-F6 stated that,

> It is all about our success and our role in broadening the participation of students in STEM. I credit my coach for constantly reminding us about the purpose of CASL. They genuinely cared about leadership that broadens the participation of students in STEM and they wanted us to be that leader. They were focused on our success, and I attribute my leadership growth to them **(CASL-F6, 2021).**

DISCUSSION

All but one participant in the study concluded that coaching is a necessary and essential aspect of leadership development training with the focus on broadening participation in STEM. They indicated that they experienced value-based coaching; and they viewed their coaches as STEM leaders who coach through modeling, inspirational motivation, resourcefulness, authentic trust, intentional reflection, and success-orientation. These findings represent the themes that emerged from the data. These themes were also utilized to answer the two research questions that guided the focus of the study (see Table 2). The Fellows described coaching as a very valuable tool for leaders in STEM. Their experiences with coaching were influenced by the way coaches modeled leadership and inspired their growth. Anthony (2017) concluded that leaders modeling affects followers' behavior and social competence during coaching process and produces positive outcomes. The participants in this study experienced authentic trust with their coaches and they grew from the challenges of intentional reflections. They experienced coaches who focused on their leadership growth and success; and through their coaches' resourcefulness, they were able to engage in various broadening participation initiatives at their respective campuses.

It is interesting to note that the participants from this study viewed their coaches as transformational leaders who model, inspire, motivate, and encourage the growth of their followers (Avolio & Bass, 2004). The findings align with transformation leadership tenets of idealized influence, inspirational motivation, intellectual stimulation, and individual consideration (Bass, 1985).

RECOMMENDATIONS

The results of this study are significant in many ways. It is the first reported study with emerging leaders from HBCUs to understand the role that coaching plays in the development of leaders to broaden participation in STEM. Although the study is highly impactful, there are notable limitations such as the lack of diversity in the sample by gender and institutional control. The study participants include only two women STEM leaders and only one from a public institution. These women represent 100% of female participants from the pool of CASL Fellows. It is recommended that CASL leaders should strategically and intentionally select more female STEM Fellows for leadership training. This may lead in further study on the topic that includes more women leaders from STEM and representatives from a more diverse pool of institutions. As CASL continues to train and develop emerging STEM leaders from HBCUs, it is recommended that a mixed-method research design that include quantitative and qualitative approaches be used for a more triangulated results to understand the perceived values of coaching on STEM Fellows. In this study, the focus was on the emerging leaders and not on the coaches; it is recommended that further studies should be conducted to include the perspectives of the coaches. Data from the coaches should include meeting observations with Fellows, interviews, and their personal reflections.

CONCLUSION

Based on the results from pilot, individual, and focus group interviews of nine (9) participants, we found that coaching is valuable for the leadership growth of emerging STEM leaders from HBCUs. The participants described the outcomes from coaching as value-based leadership to inspire and motivate growth. They overwhelmingly emphasized that coaches were valuable in improving individual and institutional outcomes through effective leadership. The themes that emerged from the study include the value of coaching, coaching through modeling, inspirational motivation, intentional reflection, resourcefulness, authentic trust, and success-orientation (Table 2).

The findings from this study have leadership, practical, educational, and policy implications. Coaching is an important and valuable aspect of leadership development programs and training. The findings from this study support the existing literature that coaching fosters growth and well-being of leaders (van Nieuwerburgh & Barr, 2017), helped leaders to navigate the complexity of

leadership (Giamellaro & Siegel, 2018; Kovas & Corrie, 2017), and increase confidence in leaders (Kovas & Corrie, 2017). The emerging leaders in this study indicated that their decision-making skills, confidence level, personal awareness skill, and communication skills increased as a result of their coach. The study is significant in bridging the research gap on the topic of this study as there is no empirical research on the value of coaching for STEM leaders within an HBCU context. Based on the findings from this study, it is reasonable to conclude that CASL is a great leadership development training program with a focus in broadening the participation in STEM at HBCUs. The findings directly contribute to the coaching research literature by confirming that the use of coaches matter in leadership development programs.

REFERENCES

Abbott, G. N., & Salomaa, R. (2016). Cross-cultural coaching: An emerging practice. In Bachkirova, T., Spence, G., & Drake, D. (Eds.), *The SAGE handbook of coaching* (pp. 453-469). Sage.

Anthony, E. L. (2017). The impact of leadership coaching on leadership behaviors. *Journal of Management Development*, *36*(7), 930-939. https://doi.org/10.1108/JMD-06-2016-0092

Avolio, B. J., & Bass, B. M. (2004). *Multifactor leadership questionnaire: Manual and sample set* (Mind garden). http://www.worldcat.org/oclc/1190934009

Bass, B. M. (1985). Leadership: Good, better, best. *Organizational Dynamics*, *13*(3), 26-40. https://doi.org/10.1016/0090-2616(85)90028-2

Bertrand, D. W. (2019). The practice of executive coaching to improve leadership capacity in academic deans at American higher education institutions. *Coaching: An International Journal of Theory, Research and Practice*, *12*(2). https://doi.org/10.1080/17521882.2018.1545136

Bolman, L. G., & Gallos, J. V. (2011). *Reframing academic leadership*. (2nd ed.). Jossey-Bass.

Burns, J. M. (1978). *Leadership*. Harper & Row.

CASL. (n. d.). *Website of the Center for the Advancement of STEM Leadership*. https://www.advancingstemleadership.net/

Coleman, M. S., Smith, T. L., & Miller, E. R. (2019). Catalysts for achieving sustained improvement in the quality of undergraduate STEM education. *Daedalus*, *148*(4). https://doi.org/10.1162/daed_a_01759

Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry & research design: Choosing among five approaches* (4th ed.). Sage.

Deiorio, N., Carney, P., Kahl, L., Bonura, E., & Juve, A. (2016). Coaching: A new model for academic and career achievement. *Medical Education Online 21*(1). https://doi.org/10.3402/meo.v21. 33480

Doscher, S., & Landorf, H. (2018). Universal global learning, inclusive excellence, and higher education's greater purposes. *Association of American Colleges & Schools Winter 2018 20*(1), 4-7.

Gallos, J. V., & Bolman, L. G. (2021). *Reframing academic leadership*. (2nd ed.). Jossey-Bass.

Giamellaro, M., & Siegel, D. R. (2018). Coaching teachers to implement innovations in STEM. *Teaching and Teacher Education*, *76* (August 2018), 25-38. https://doi.org/10.1016/j.tate.2018.08.002

Grant, A., Cavanagh, M., Parker, H., & Passmore, J. (2010). The state of play in coaching today. A comprehensive review of the field. In *International Review of Industrial and Organizational Psychology 2010* (Vol. 25). Wiley-Blackwell. https://doi.org/10.1002/9780470661628

Jackson, S., & Joanna Bourne, D. (2020). Can an online coaching programme facilitate behavioural change in women working in STEM fields? In *International Coaching Psychology Review l* (Vol. 15, Issue 1). www.thrivepartners.co.uk

Jones, T. (2013). *Addressing a historical mission in a performance driven system: A case study of a public historically Black university engaged in the equity scorecard process*. (ProQuest LLC, Ph.D. Dissertion). University of Southern California.

Kovacs, L. C., & Corrie, S. (2017). Executive coaching in an era of complexity. Study 1. Does executive coaching work and if so how? A realist evaluation. In *International Coaching Psychology Review,12*(2), 5-17.
Lawton-Smith, C. (2017). Coaching for resilience: An integrated approach. *International Coaching Psychology Review*, *12*(2), 6-23.
Nardick, D. (2017). Reflections of a higher education leadership coach. *Journal on Excellence in College Teaching, 28*, 63-81.
Pennington, G. (2001, March). *Coaching African American executives.* Paper presented at the Society of Consulting Psychologists, Mid-Winter Conference. New York. https://youtu.be/xnvz1i4Eg-A
Robison, S., & Gray, C. (2017). Agents of transformational change: Coaching skills for academic leaders. *Journal on Excellence in College Teaching, 28*, 5-8.
Rogers, J. (2016). *Coaching skills: The defining guide to being a coach* (4th ed.). Open University Press.
Saldaña, J. (2015). *The coding manual for qualitative researchers* (3rd ed.). Sage.
Stake, R. E. (2003). Qualitative case studies. In Denzin, N. K., & Lincoln, Y. S. (Eds.), *Strategies of qualitative inquiry* (2nd ed., pp. 119-150). Sage.
Stout-Rostron, S. (2011). How is coaching impacting systemic and cultural change within organizations? *The International Journal of Coaching in Organizations*, *8*(4), 5-27. www.pcpionline. com
van Nieuwerburgh, C., & Barr, M. (2017). Coaching in education. In Bachkirova, T., Spence, G., & Drake, D. (Eds.), *The SAGE handbook of coaching* (pp. 505-520). Sage.
Warrick, D. D. (2011). Journal of leadership, accountability and ethics. *Journal of Leadership, Accountability, and Ethics*, *8*(5), 11-26. http://www.na-businesspress.com/ JLAE/warrick_abstract. html
Wiginton, J. G., & Cartwright, P. A. (2020). Evidence on the impacts of business coaching. *Journal of Management Development*, *39*(2), 163-180. https://doi.org/10.1108/JMD-09-2018-0266
Yin, R. K. (2003). *Case study research: Design and methods (Applied Social Research Methods)* (4th ed.). Sage.

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