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Paper ID #39169

Board 238: Collaborative Research: AGEP FC-PAM: Project ELEVATE (Equity-focused Launch to Empower and Value AGEP Faculty to Thrive in Engineering)

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Dr. Alaine M. Allen is an educator who intentionally works to uplift the voices of and create opportunities for individuals from groups historically marginalized in science, technology, engineering and mathematics (STEM) environments. She currently serve

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Education Ph.D.; Computer Science and Engineering, University of Michigan, 1988 M.S.E.; Computer, Information and Control Engineering, University of Michigan, 1985 B.S.; Computer Engineering, University of Michigan, 1983

Academic Positions Held Strecker Dean of Engineering, College of Engineering, Carnegie Mellon University, 2020-present. Professor, Department of Electrical and Computer Engineering, Carnegie Mellon University, 2020-present.

Interim Director, Discovery Partners Institute (DPI), University of Illinois System, 2018-2019. Founding director for DPI, which is a joint education, research, and innovation institute led by the University of Illinois System (U of I System) and its three universities, and is backed by a $500M appropriation from the State of Illinois. DPI's mission is to establish collaborative partnerships that address 21st century societal grand challenges, promote entrepreneurship, and educate the next-generation workforce. Its primary goal is to conduct purpose-driven research and education that create actionable results that will have tangible results throughout the economy, including those for the underserved. As DPI's first full-time director, I have moved the institute from vision to reality while engaging a diverse set of stakeholders. During the 8 months that I have served as interim director, I have 1) built strong faculty support and engagement (including ~1000 faculty across our three system universities), 2) built strong support and engagement with the Chicago business and tech community, 3) opened a 20,000 sq. ft. facility for the institute in downtown Chicago, and 4) announced and/or built relationships with 5 non-UI system DPI academic partners.

Herman M. Dieckamp Endowed Chair in Engineering, UIUC, 2019-2020. This named professorship was given to Sanders in 2019 for his contributions related to trustworthy systems, particularly those that protect critical infrastructure.

Head, Department of Electrical and Computer Engineering, UIUC, 2014-Present (on leave as of Aug. 2018). Interim Head, Department of Electrical and Computer Engineering, UIUC, 2013-2014. Executive officer (Head) for department with approximately 110 faculty members and 60 staff; responsible

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for administrative, budgetary, hiring, and tenure decisions, and for leading the faculty and staff in the development of research, teaching, and public service programs. Oversees administrative and research expenditures of about $75M per year. Oversees and participates in extensive advancement activities as head, including managing and increasing the Dept. endowment of approximately $75M. Leads aggressive faculty hiring campaign that has hired 35 new tenure-track, 8 teaching, and 5 research faculty since Jan. 2014.

Director, Coordinated Science Laboratory, UIUC, 2010-2014. Acting Director, Coordinated Science Laboratory, UIUC, 2008-2010. Executive officer (Director) of laboratory; responsible for research program with over 100 faculty members and 350 technical staff members. During Sanders's term as director, CSL's annual research expenditures rose from $17M to over $40M. It is a premier, multidisciplinary research laboratory that focuses on information technology at the crossroads of computing, control, and communications. During Sanders's tenure as director, CSL contained 3 institutes (the Advanced Digital Sciences Center, the Information Trust Institute, and the Parallel Computing Institute) and 7 centers (Center for Exascale Simulation of Plasma-Coupled Combustion; Center for People and Infrastructures; CompGEN; the Health Care Engineering Systems Center; the National Center for Professional & Research Ethics; SONIC Systems on Nanoscale Information fabriCs; and TCIPG, the Trustworthy Cyber Infrastructure for the Power Grid Center).

Member, Board of Directors, Illinois at Singapore Pte. Ltd., 2016-Present.

Associate Director, Advanced Digital Sciences Center, UIUC, 2009-2016. Co-founded Center in 2009; is Illinois-based lead of the center, responsible (together with director) for its overall operation. ADSC is a bricks-and-mortar research laboratory in Singapore, with 14 participating Illinois faculty, 57 full-time technical staff members, and about $70M U.S. in research funding (over 7 years) from the government of Singapore.

Donald Biggar Willett Professor in Engineering, Department of Electrical and Computer Engineering, UIUC, 2005-2018. This named professorship was given to Sanders in 2005 for his contributions in dependability/security evaluation, reliable and secure systems, and computer systems modeling and analysis.

Director, Information Trust Institute, UIUC, 2004-2011. Executive officer (founding Director); established the Institute and grew it to include over 100 faculty from 28 departments, bringing in over $80M of external research funding and creating or helping create the TCIP and TCIPG (Trustworthy Cyber Infrastructure for the Power Grid) Centers, the Boeing Trusted Software Center, the Illinois Cyber Security Scholars Program, the Illinois Center for a Smarter Electric Grid, the Center for Assured Critical Application & Infrastructure Security (CACAIS), the Assured Cloud Computing University Center of Excellence, and an NSA Science of Security Lablet.

Professor, Information Trust Institute, UIUC, 2004-Present.

Professor, Department of Electrical and Computer Engineering, UIUC, 1998-2019.

Professor, Coordinated Science Laboratory, UIUC, 1998-2019.

Associate Professor, Department of Electrical and Computer Engineering, UIUC, 1994-1998.

Research Associate Professor, Coordinated Science Laboratory, UIUC, 1994-1998.

Faculty Affiliate, Department of Computer Science, UIUC, 1994-Present.

Associate Professor, Dept. of Electrical and Comp. Engineering, University of Arizona, Tucson, AZ, 1994.

Assistant Professor, Dept. of Elect. and Comp. Engineering, Univ. of Arizona, Tucson, AZ, 1988-1994.

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Jacqueline (Jacki) Rohde is the Assessment Coordinator in the School of Electrical and Computer Engineering at the Georgia Institute of Technology. Her interests are in sociocultural norms in engineering and the professional development of engineering students.

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Charlie Diaz is a PhD student studying Higher Education at the University of Pittsburgh. He is a recipient of the K. Leroy Irvis Fellowship. His research interests include minoritized student experiences in Higher Ed, student activism, and the development of inclusive policy and practice in Higher Ed.

Nelson O. O. Zounlomè

Nelson O. O. Zounlome, Ph.D., is the Founder, CEO, and a mental health & academic thrive consultant through Liberate The Block (https://liberatetheblock.com/) ˜ an agency dedicated to helping Black, Indigenous, and People of Color (BIPOC) in higher ed thrive. Dr. Z. is also a first-generation college graduate, child of immigrants, and a published author. He is a former McNair Scholar, National Academies of Sciences, Engineering, & Medicine-Ford Foundation Fellow, Herman B. Wells Graduate Fellow, International Counseling Psychologist, former Assistant Professor at the University of Kentucky, and current Post-Doctoral Research Scholar at the University of Pittsburgh. Dr. Z.'s research program focuses on examining the impact of intersectional oppression on historically excluded groups & creating culturally relevant interventions to enhance their well-being. Within this framework, he studies academic persistence and mental wellness to promote holistic healing among BIPOC. He earned Bachelor's degrees in Psychology & Sociology, a Master's degree in Learning Science-Educational Psychology Track, and is a Ph.D. in Counseling Psychology from Indiana University. In addition to work, Dr. Z. loves reading, discovering new music/art, outdoor activities, time with friends and family, and living a holistically full life.

Collaborative Research: AGEP FC-PAM: Project ELEVATE (Equity-focused Launch to Empower and Value AGEP Faculty to Thrive in Engineering)

1. Abstract

Carnegie Mellon University, Johns Hopkins University, and New York University created the Project **E**quity-focused **L**aunch to **E**mpower and **V**alue **A**GEP Faculty to **T**hrive in **E**ngineering (ELEVATE) Alliance (National Science Foundation Awards #2149995, #2149798 #2149899 from the Division of Equity for Excellence in STEM in the Directorate for STEM Education) to develop a model to promote the equitable advancement of early career tenure-track engineering faculty from populations of interest to the Alliances for Graduate Education and the Professoriate (AGEP) program. The goal of this AGEP Faculty Career Pathways Alliance Model (FCPAM) is to develop, implement, self-study, and institutionalize a career pathway model that can be adapted for use at other similar institutions for advancing early career engineering faculty who are: African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders. This NSF AGEP FCPAM will provide a framework for institutional change at private, highly selective research institutions that will enable all faculty to be members of a collaborative community. Improving the experience of these faculty can lead to increased diversity in the engineering faculty and ultimately result in graduating more engineering students from diverse populations and increasing diversity in the engineering workforce.

The Alliance interventions will focus on three major areas, 1) equity-focused institutional change designed to make structural changes that support the advancement of AGEP faculty, 2) identity-affirming mentorship that acknowledges and provides professional support to AGEP faculty holistically, recognizing all parts of their identity and 3) inclusive professional development that equips all engineering faculty and institutional leaders with skills to implement inclusive practices and equips AGEP faculty for career advancement.

In this paper, we will discuss the process of creating a leadership team to address these focus areas and assess the processes and procedures that currently exist at the three institutions as we begin to institutionalize these change efforts. We provide an overview of the project and efforts to date. We will also present our process for engaging in our initial self-study evaluation and next steps.

2. Introduction

Carnegie Mellon University (CMU), Johns Hopkins University (JHU), and New York University (NYU) propose the Project **E**quity-focused **L**aunch to **E**mpower and **V**alue **A**GEP Faculty to **T**hrive in **E**ngineering (ELEVATE) Alliance. These three private universities, each located in urban areas, are well respected for their academics and research. They are members of the Association of American Universities, an invitation-only organization of research

institutions, and are R1, very high research activity institutions within the Carnegie Classification system. Finally, based on the 2023 US News and World Report [1] ranking for engineering graduate schools, Carnegie Mellon is ranked #4, Johns Hopkins is ranked #16 and New York University is ranked #33.

The Project ELEVATE team will develop an alliance model to promote the equitable advancement of early career tenure-track engineering faculty from AGEP populations at CMU, JHU, and NYU. The goal of this NSF AGEP Faculty Career Pathways Alliance Model (FCPAM) is to develop, implement, self-study, and institutionalize a career pathway model that can be adapted for use at other similar institutions for advancing early career engineering faculty who are: African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders.

3. Project Description
a. Participating Institutions

In 2017, after the College of Engineering at Carnegie Mellon University (CMU) lost some of its URM[1] faculty, the college developed its first diversity strategic plan. The implementation of this plan strengthened existing partnerships with engineering diversity organizations and created new partnerships with organizations such as the President's Postdoctoral Fellowship. In 2020, the racial and social unrest of the country exposed a need to not only increase representation among faculty, but to also strengthen the culture and climate to be more welcoming of individuals from historically marginalized groups. The college responded by developing a college-wide diversity, equity, and inclusion (DEI) committee, creating departmental committees, hiring an inaugural associate dean for DEI, and creating a new DEI strategic plan.

A similar shift occurred in the Whiting School of Engineering at Johns Hopkins University (JHU) in 2016, when they hired an inaugural assistant dean for diversity and inclusion dedicated to student and faculty affairs. They additionally initiated a pilot faculty launch program in 2017 to provide support and guidance to junior faculty launching their career at JHU, with departments prioritizing the hiring of URM or women faculty members.

Finally, in 2019, the Tandon School of Engineering at New York University (NYU) formed an Inclusion @ Tandon committee that created the college's first strategic plan for Inclusion, Diversity, Equity, and Belonging (IDBE). This committee includes a faculty representative from each department to lead the departmental IDBE plans. In 2020, Tandon launched its Office of Inclusive Excellence (OIE) and hired four Inclusion Officers to coordinate DEI efforts in the Tandon School, which includes one officer who focuses on faculty programs and policies. In addition, NYU joined the Presidential Postdoctoral Fellowship Program to help in its recruiting efforts.

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[1] As defined through AGEP, URM faculty are African Americans, Hispanic Americans, American Indians, Alaska Natives, Native Hawaiians, and Native Pacific Islanders.

From recruiting efforts in the years 2016-2020, each institution had an increase in the number of URM tenure-track engineering faculty. Project ELEVATE Alliance institutions will continue the efforts to recruit faculty from URM populations over course of grant. Additionally, each institution had an interest in further developing inclusive practices on campus. In June 2021, representatives from the engineering schools at CMU and JHU attended the Aspire Summer Institute (ASI), an immersive professional development experience for faculty offered by the NSF Eddie Bernice Johnson INCLUDES Aspire Alliance. Through this training, CMU and JHU embraced identity-affirming mentorship as a strategy to address the color evasive perspective of their engineering schools that overlooks racial differences and emphasizes sameness [2]. The two schools also developed a draft action plan that focused on building each school's capacity to be equity-minded using the Inclusive Professional Framework for Faculty (IPF). Following the ASI, CMU, JHU, and NYU began meeting weekly to share learnings from the institute, discuss policies and practices related to faculty advancement at each institution, identify strengths and challenges of these institutions, and align goals for collaboration.

b. Project ELEVATE Framework

The Four Frames Model for Creating Inclusive Organizations from the Women in Engineering ProActive Network (WEPAN) provided a foundation for the Project ELEVATE Framework, because the model focuses on equipping the individual to minimize differences in experiences, creating equal opportunity for everyone, valuing difference among the community, and managing culture to address practices that lead to inequity [3]. In addition, the NSF Eddie Bernice Johnson INCLUDES Aspire Institutional Model of Increasing Faculty Diversity highlighted key areas to support faculty hiring and retention, particularly the information regarding transition, professional development, advancement, and satisfaction and support. Finally, the team focused its attention on institutional change versus efforts that exclusively focused on new faculty, because advancement for AGEP faculty is typically limited by lack of infrastructure to support their needs [4], [5].
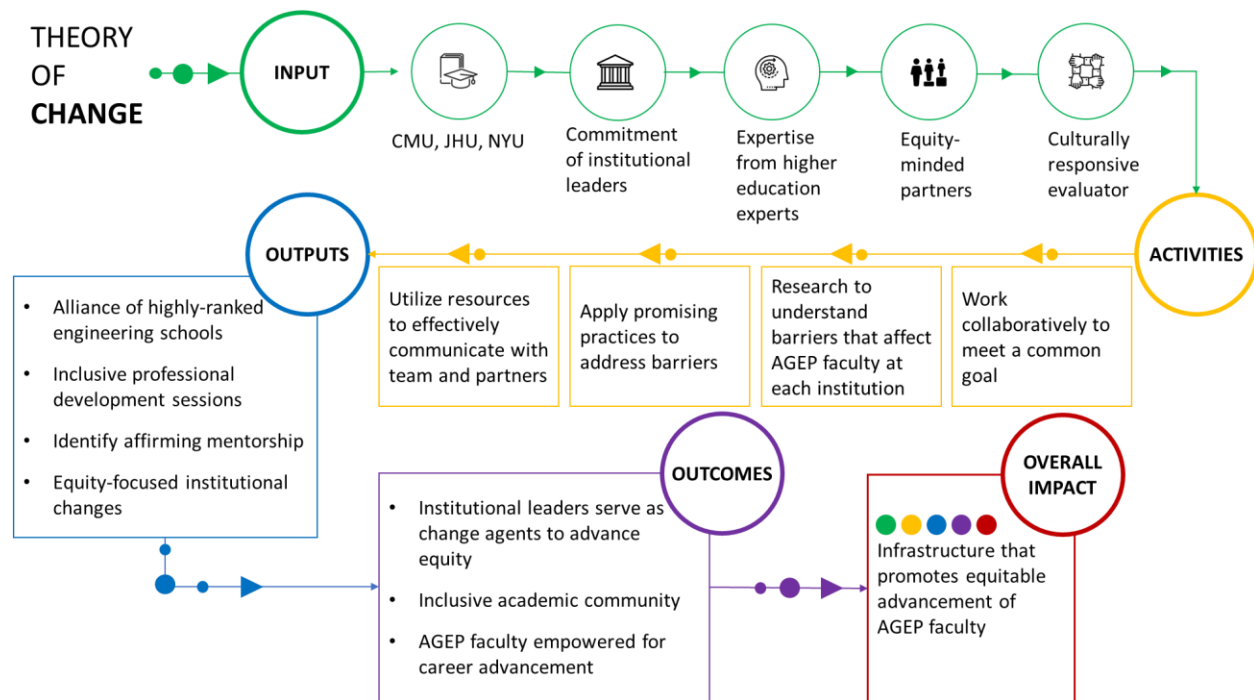
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Figure 1. Theory of Change for Project ELEVATE

Our roadmap for change begins with a collaborative partnership among peer institutions, leadership buy-in, equity-minded partners, higher education expertise, and culturally responsive evaluators, shown in Figure 1 (theory of change). The primary activities outlined in our theory of change include working collaboratively to meet a common goal, conducting research through the self-study process to understand barriers for AGEP faculty, applying promising practices using an intersectional framework to address barriers [6], [7], and utilizing resources to effectively communicate. As a result, the team will create an alliance of highly selective engineering schools, develop inclusive professional development practices for their entire engineering community, develop an identity-affirming mentorship program for AGEP faculty that mitigates the negative impact of a color evasive perspective, and finally, implement equity-focused institutional changes. These outputs will lead to informed institutional leaders who advance equity, an inclusive academic community for engineering faculty, and AGEP faculty members who are empowered for career advancement.

The Alliance interventions will focus on three major areas, 1) equity-focused institutional change designed to make structural changes that support the advancement of AGEP faculty, 2) identity-affirming mentorship that acknowledges and provides professional support to AGEP faculty holistically, recognizing all parts of their identity and 3) inclusive professional development that provides all engineering faculty and institutional leaders with skills to implement inclusive practices and equips AGEP faculty for career advancement. Interventions will be carried out by teams with a representative from each alliance institution. Furthermore, our approach will consider an intersectional lens in developing these interventions, shown to be more

effective in reducing barriers to women of color faculty in engineering [7]. In Figure 2, we display the overall framework of Project ELEVATE, which incorporates these three focus areas and shows their interconnectivity. In addition, this figure shows that institutional leadership, engineering faculty and an inclusive academic community are critical to advancing the work. At the core of the framework for change is the institutional infrastructure that will sustain institutional change in the long-term. Institutional leaders, including our Deans and Associate Deans, will be empowered to be change agents to push the project forward. Through our identity-affirming mentorship and inclusive professional development, we will work toward developing inclusive academic communities at each of our campuses.

Figure 2. Project ELEVATE Framework

i. Equity-focused Institutional Change

While the self-study will identify specific intervention activities, the experiences of our institutions have demonstrated that promotion and tenure (P&T) processes are essential components of propelling institutional change and facilitating inclusive excellence. Implementing a more equitable P&T process relies on promoting an inclusive and equitable culture among those who make recommendations and decisions in the process. To help promote this culture, we will develop educational materials and resources to provide to letter writers to help them write thoughtful and inclusive content, and we will offer annual training to P&T committees and senior faculty, highlighting the impact of policies on faculty of different races, ethnicities, genders, and other marginalized groups, especially where the intersections of these identities can lead to additional barriers [6]. This training will provide insights into how to identify institutional barriers and deploy culturally competent professional development while also advocating for equitable weighting of service and teaching and consideration of work/life issues [8]. It is also imperative that we create clear and transparent guidance for our AGEP

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faculty that highlights the role of research, teaching, and service, and clarifies the degree to which each helps with achieving tenure. Since each alliance institution has different P&T processes, policies, and norms, we will self-study each of our policies, processes, and norms to identify the most effective mechanisms that can be adopted for this purpose. Lastly, we will build infrastructure through permanent staff positions to support institutional changes that are taking hold based on learning from the self-study.

Sponsorship of AGEP faculty is a critical part of Project ELEVATE's equity-focused institutional change initiatives. Successful faculty not only receive high quality mentorship, but they are also often sponsored in ways that allow them to augment their efforts and build career momentum. Sponsorship is about helping new faculty "plug in" to the research and scholarship engine that drives the academic system—accessing networks of important collaborators, evaluators, and program managers; learning about and getting invited to selective or less-advertised funding opportunities; and gaining visibility through publication in selective journals, seminar invitations at prestigious conferences and institutions, as well as citations by influential members of the community. We will educate leaders and senior faculty about specific ways to provide sponsorship to AGEP engineering faculty, using available models such as the ABCD framework provided by Chow [9]. In the ABCD framework, four types of sponsorship are highlighted: Amplify (help promote AGEP faculty), Boost (underwrite or lend legitimacy to AGEP faculty scholarship), Connect (claim association with AGEP faculty), and Defend (directly counter those who would dismiss or criticize AGEP faculty).

ii. Identity-Affirming Mentorship

Effective mentorship is particularly critical for retention and advancement of faculty in AGEP populations who experience unique identity related challenges in the professoriate such as less access to institutional capital, higher service burdens, daily microaggressions and racial battle fatigue [10]. Identity-affirming mentorship affirms the legitimacy and belonging of underrepresented faculty in academia and requires those who serve as mentors to have an awareness of identity, positionality, and intersectionality in shaping access to resources, self-efficacy and opportunities. Effective mentorship involves the provision of career support, including career guidance, skill development, networking, sponsorship, and psychosocial/ emotional support [11]. The goal of this project is to develop and sustain an infrastructure that facilitates impactful mentorship of AGEP early career faculty and supports progressive career advancement and promotion. The alliance institutions will leverage evidence-based mentoring practices and education by partnering with NSF Eddie Bernice Johnson INCLUDES Aspire Alliance and the Center for the Improvement of Mentored Experiences in Research (CIMER). Mentorship education for Project ELEVATE Mentors will center on the IPF for faculty developed by the Aspire Change Network and equip faculty leaders and prospective mentors with skills to develop effective reciprocal relationships with AGEP faculty that lead to increased retention and tenure. Rather than dyadic mentorship, the alliance will leverage the strength of our

collective faculty expertise to connect AGEP early career faculty with senior faculty across the alliance. Cross institutional mentorship groups will incorporate tenets of the Ideal Framework for mentoring faculty from ethnically and racially underrepresented groups [12]. In addition, the AGEP faculty will be connected to one another as a peer mentoring network.

iii. Inclusive Professional Development

Professional Development for early career faculty is critical in providing valuable resources and knowledge to faculty as they advance in their career. As part of the Inclusive Professional Development efforts, the alliance institutions will develop and deliver equity-focused professional development within academic departments. Utilizing the IPF: Faculty [13], the alliance institutions will develop a framework for professional development that equips engineering faculty at all levels to cultivate a culture of equity and inclusion. The IPF: Faculty is designed to lead to more inclusive practices by faculty in their teaching, advising, and research mentoring, as well as peer-focused practices through their colleagueship and leadership. These professional development activities will focus on developing awareness and understanding among all faculty of all cultural identities, as well as the intersectionality of these identities, and examining the role identity plays in the success of AGEP faculty. In addition, we will concentrate on building equitable faculty relationships through effective communication and relational skills.

c. Development of the Leadership Team

Our roadmap for change begins with a collaborative partnership among peer institutions, leadership buy-in, equity-minded partners, higher education expertise, and culturally responsive evaluators. Spanning across CMU, JHU, and NYU, the Project ELEVATE team is committed to the systemic and institutional change needed to advance targeted populations toward tenure and promotion in STEM. We designed an overarching and integrated organizational structure and collaboration approaches that are conducive to managing this change. Our team is comprised of a diverse set of stakeholders including faculty, associate deans and higher education researchers who hold multidisciplinary knowledge, both internal and external to the AGEP Alliance, and who have experiences, expertise, skill sets, and beliefs aligned with the mission of the AGEP, and resources and decision-making abilities to actionize the change we are trying to impact.

Signaling institutional and personal commitment to the mission of the AGEP Alliance, the Deans of the Colleges of Engineering for each institution are also participating in Project ELEVATE. The Deans and the Project ELEVATE team firmly believe that this level of commitment is not only needed to understand the problems and issues and to design effective programs at the institutions, but it is also critical for advocacy at the institutional level at each university in order to affect changes to recruitment, promotion and tenure, and other processes

that require significant updates and collaboration within the institution to realize the desired impact.

The Leadership Council for the AGEP Alliance is an internal advisory committee that will facilitate institutional support for long-term institutional change. These institutional leaders at the partner institutions will include Vice Provosts for Faculty, Vice Provosts for Diversity, Equity and Inclusion (CMU and JHU) or Chief Diversity Officers (NYU) and Deans of Engineering. These executive leaders have the ability to provide input and feedback and impact change at the institutional level in concert with the AGEP Alliance. Project ELEVATE will also benefit immensely from the voices of community members impacted by the issues and leaders who can impact the change desired by the Alliance through an External Advisory Board (EAB). Working alongside the internal Leadership Council and representation from citizen scientists, local organizations, local, state and federal policy makers, educators, ethics and public policy experts, diversity, equity and inclusion researchers, and scientists, among others, the EAB will work alongside the PIs and Alliance committees to inform research, refine projects, assess progress and risks, propose mitigation strategies, and participate in annual program reviews and assessments including the self-study.

4. Current Work
a. Mentoring and recruiting AGEP faculty

At the start of Project ELEVATE, our team informed department heads of the new initiative and each institution worked with institutional data representatives to identify tenure-track faculty at the pre-tenure level in the College of Engineering. To help recruit faculty to participate in the program, we created a brochure that provided details on the program including information about the three interventions. We also created an online sign-up form that allowed faculty interested in participating to validate eligibility. The Project ELEVATE PIs recruited the faculty by sending an email which included the brochure, a description of the program, the benefits of participation, and an online sign-up form. To engage as many early career faculty from AGEP populations as possible and address any hesitancy that might exist among potential participants, Project ELEVATE team members met with faculty to follow up regarding recruitment and answer questions. In the process of recruiting faculty, the Project ELEVATE team realized that each school included early career engineering faculty who are Black, Latinx or Indigenous, but not US citizens or permanent residents. While this group did not fit the AGEP population guidelines, they experienced their role of engineering faculty in a similar way as their US citizen or permanent resident counterparts. Therefore, the alliance institutions chose to self-sponsor those faculty as Project ELEVATE participants.

In recruiting mentors to the project, our team developed a list of criteria that were important for successful mentorship of underrepresented faculty. Mentors should be at the level of full professor, demonstrate a commitment to diversity, equity and inclusion or be open to diverse viewpoints and have a successful track record of mentorship. Through our recruitment

process, twelve mentors have committed to participate in our program. Our faculty mentors have a wealth of social capital and experience and include department heads, National Academy of Engineering members and a president emeritus. Project ELEVATE participants will also have access to our ELEVATE Mentor Networks. Our ELEVATE networks contain an external mentor, who provides broad advice to early faculty on navigating the roles and responsibilities of faculty life (teaching, lab management, advising). In addition, URM Senior Faculty Mentors will serve as guest mentors, workshop facilitators on issues specific to navigating issues of identity. Lastly, through our collaboration with IMPACT - *Increasing Minority Presence within Academia through Continuous Training* [14], emeritus faculty can assist with long term career advancement, promotion, and tenure. This network will provide faculty with resources at multiple levels to help support them toward success in pursuit of their academic career pathway.

The first event of Project ELEVATE was a virtual kickoff held in January 2023. The purpose of this event was to officially kick-off the project and to build community within the Project ELEVATE participants. In this event, eleven Project ELEVATE participants were able to connect with two guest mentors who have had success in navigating the academic career pathways to become leaders at their institutions. Project ELEVATE participants were able to hear their stories and ask questions about their experiences. To build community among the Project ELEVATE participants, we used breakout sessions and jamboards to facilitate discussion among the faculty.

b. Internal Evaluation efforts

The Internal Evaluation team promotes the success of the alliance by collecting project-relevant data, conducting analyses, and generating internal reports to offer feedback and actionable recommendations. The relevant streams of data include reviewing institutional documents about professional advancement for tenure-stream faculty, observations of project activities, campus visits, constituent focus groups, climate and infrastructure surveys, and semi-structured interviews with Project ELEVATE participants, Project ELEVATE mentors, Department Chairs, and Deans. These data streams are aligned with the three Project foci of equity–focused institutional change, identity-affirming mentorship, and inclusive professional development. Insights will help identify challenges and successes of Project ELEVATE and will support the development of a model to promote the equitable advancement of early career tenure-stream engineering faculty from populations of interest to the AGEP program.

At this time, the internal evaluation team has conducted its first campus visit, has collected observational data from Project meetings and the mentoring kickoff event, and has completed a baseline document analysis of institutional materials related to professional advancement. The methods, findings, and recommendations from this document analysis are described in further detail below.

Over the course of two months, Project ELEVATE team members collected documents from each institution from the following categories: faculty handbooks, onboarding materials,

promotion and tenure guidelines and procedures, professional development materials, presentations/publications around URM faculty, data on the last five years of faculty hiring and promotion at the school level broken down by race/ethnicity, department- and school-level meeting agendas and meeting minutes, mentorship guidelines and processes, and service requirements, guidelines, and/or records of participation.

The internal evaluation team then analyzed the documents through open and axial coding to develop a sense of the current landscape for professional advancement at the alliance institutions. Because of the heterogeneity of documents we solicited, the goal of this process was not to quantify specific kinds of information (e.g., counting up the resources available to AGEP faculty). Instead, we took on a thematic analysis [15], which allowed us to identify prevailing patterns that emerged from a deep reading of each document while comparing it against other material in the dataset. We systematized the process by generating specific research questions, engaging in open coding based on those research questions, and regular conversations to build consensus on the major themes. These themes related to (1) document access (or lack thereof), (2) the "hidden curriculum" of obtaining tenure [16], and (3) the ways in which social identities (especially race/ethnicity) were or were not embedded within the documents. The internal evaluation team then compiled the analysis into a report that was sent to the Project ELEVATE leadership team for a broader discussion and reflection of how the findings might inform future alliance efforts.

c. Future Work

As the Project ELEVATE Alliance institutions have recruited the first cohort of mentors and mentees, we are in the process of scheduling the mentor training sessions through the CIMER. This training will occur in Spring 2023 and will consist of four 1.5 hour sessions utilizing CIMER Entering Mentoring curriculum with a focus on mentorship of junior faculty. Discussion and case studies will center DEI concepts and skills in this training. We will also be preparing for the Project ELEVATE Summer Retreat, to be held in June 2023. This retreat is an important event in our community building and will create and sustain cohorts and affinity networks across alliance institutions. With an overall objective that focuses on the interpersonal relationships between Project ELEVATE leadership across the three schools, senior faculty and Project ELEVATE participants, all participants will leave the annual retreat feeling that they know their colleagues better than they did before. During this retreat, attendees will arrive at a deeper understanding of the role that diverse relationships play in their life & work; practice active listening skills as a way of demonstrating the value they place on the perspectives held by their colleagues; reflect on the value of perspectives held by their colleagues; and receive practical advice on navigating the academic environment to lead to successful promotion and tenure. These activities will complement and reinforce some of the most beneficial components of our mentoring initiatives including navigating university norms and values and building a network of mentors [12], [17]–[21].

Our Inclusive Professional Development team will work with NSF Eddie Bernice Johnson INCLUDES ASPIRE to develop content for inclusive professional development for all engineering faculty at the three institutions. Facilitators at each institution will be trained with the NSF Eddie Bernice Johnson INCLUDES ASPIRE team and our team will overview and give suggestions on the training material based on institutional needs. All three alliance institutions use the IPF:Faculty in collaboration to develop content for implementation at each campus in the Fall 2023.

As we move toward institutional change, we are implementing structural changes to maintain the new programs being developed. At each institution, staff positions are currently being created to assist faculty in implementing changes that will sustain these programs long term. The initial self-study and subsequent report included findings that highlight needs that are aligned with proposed actions related to institutional change. Based on these findings, the three institutions will review promotion and tenure documents for clarity and transparency and implicit bias in the immediate future. Beyond P&T procedures, there is also a need to provide examples of "countable" activities and guidance on norms around which are most valued. Providing more transparent guidance will benefit both the faculty who are striving for tenure as well as senior faculty who are evaluating faculty in the P&T process, ultimately creating a clearer and more equitable system.

The internal evaluation team will continue to support the activities of the alliance by providing self-study reports that include actionable feedback that can be used by Project ELEVATE as the alliance continues to refine and develop its action plans. Immediate next efforts will involve engaging in campus visits to continue to assess the context for AGEP faculty success at CMU, JHU and NYU. The data we collect during these visits from campus constituents including engineering Deans, Department Chairs, Project ELEVATE participants and Mentors as well as our observations of the ELEVATE retreat this summer will augment the work we completed in our initial document analysis and form our first year internal evaluation report. That report will be designed to support the team as we continue to develop and execute our plans during the second year of the grant.

5. Acknowledgments

References

[1] "U.S. News and World Report Engineering Graduate Schools," *US News World Rep.*, 2023, [Online]. Available: https://www.usnews.com/best-graduate-schools/top-engineering-

schools/eng-rankings

[2] S. A. Annamma, D. D. Jackson, and D. Morrison, "Conceptualizing color-evasiveness: using dis/ability critical race theory to expand a color-blind racial ideology in education and society," *Race Ethn. Educ.*, vol. 20, no. 2, pp. 147–162, Mar. 2017, doi: 10.1080/13613324.2016.1248837.

[3] K. Griffin, J. Bennett, and T. York, "Leveraging Promising Practices: Improving the Recruitment, Hiring, and Retention of Diverse & Inclusive Faculty," Jun. 2020. [Online]. Available: https://doi.org/10.31219/osf.io/dq4rw

[4] B. Montgomery, "Academic Leadership: Gatekeeping or Groundskeeping?," *J. Values-Based Leadersh.*, vol. 13, no. 2 Summer/Fall 2020, p. article 16, doi: https://doi.org/10.22543/0733.132.1316.

[5] E. McGee, "Interrogating Structural Racism in STEM Higher Education," *Educ. Res.*, vol. 49, no. 9, pp. 633–644, doi: https://doi.org/10.3102/0013189X20972718.

[6] M. Corneille, A. Lee, S. Allen, J. Cannady, and A. Guess, "Barriers to the advancement of women of color faculty in STEM," *Equal. Divers. Incl. Int. J.*, vol. 38, no. 3, pp. 328–348, Jan. 2019, doi: 10.1108/EDI-09-2017-0199.

[7] M. A. Armstrong and J. Jovanovic, "The intersectional matrix: Rethinking institutional change for URM women in STEM.," *J. Divers. High. Educ.*, vol. 10, pp. 216–231, 2017, doi: 10.1037/dhe0000021.

[8] K. Beddoes and A. L. Pawley, "'Different people have different priorities': work–family balance, gender, and the discourse of choice," *Stud. High. Educ.*, vol. 39, no. 9, pp. 1573–1585, 2014, doi: 10.1080/03075079.2013.801432.

[9] R. Chow, "Don't Just Mentor Women and People of Color. Sponsor Them.," *Harvard Business Review*, Jun. 30, 2021. [Online]. Available: https://hbr.org/2021/06/dont-just-mentor-women-and-people-of-color-sponsor-them

[10] R. E. Zambrana, A. Harvey Wingfield, L. M. Lapeyrouse, B. A. Dávila, T. L. Hoagland, and R. B. Valdez, "Blatant, Subtle, and Insidious: URM Faculty Perceptions of Discriminatory Practices in Predominantly White Institutions," *Sociol. Inq.*, vol. 87, no. 2, pp. 207–232, 2017, doi: https://doi.org/10.1111/soin.12147.

[11] National Academies of Sciences Engineering and Medicine, *The Science of Effective Mentorship in STEMM*. Washington, DC: The National Academies Press, 2019. doi: 10.17226/25568.

[12] S. Mendez, J. Tygret, V. Conley, C. Haynes, and R. Gerhardt, "Exploring the Mentoring Needs of Early- and Mid-Career URM Engineering Faculty: A Phenomenological Study," *Qual. Rep.*, vol. 25, no. 4, pp. 891–908, doi: https://doi.org/10.46743/2160-3715/2020.4159.

[13] D. L. Gillian-Daniel, W. G. Troxel, and S. Bridgen, "Promoting an Equity Mindset through the Inclusive Professional Framework for Faculty," *Dep. Chair*, vol. 32, no. 2, pp. 4–5, Sep. 2021, doi: 10.1002/dch.30408.

[14] C. L. Haynes, R. A. Gerhardt, Valerie Martin Conley, and S. L. Mendez, "A Symbiotic Solution for Facilitating Faculty Transitions in Engineering Academia," *Assoc. Eng. Educ. - Eng. Libr. Div. Pap.*, Jun. 2017, [Online]. Available: https://www.proquest.com/conference-papers-proceedings/symbiotic-solution-facilitating-faculty/docview/2317824909/se-2?accountid=9902

[15] G. A. Bowen, "Document Analysis as a Qualitative Research Method," *Qual. Res. J.*, vol. 9, no. 2, pp. 27–40, Jan. 2009, doi: 10.3316/QRJ0902027.

[16] I. Villanueva, T. Carothers, M. Di Stefano, and Md. T. Khan, "'There Is Never a Break':

The Hidden Curriculum of Professionalization for Engineering Faculty," *Educ. Sci.*, vol. 8, no. 4, 2018, doi: 10.3390/educsci8040157.

[17]   B. Baez, "Faculty of color and traditional notions of service," *Thought Action NEA High. Educ. J.*, vol. 12, pp. 131–138, 1999.

[18]   W. B. Johnson, *On Being a Mentor: A Guide for Higher Education Faculty*, Second Edition. Routledge, 2015. [Online]. Available: https://www.routledge.com/On-Being-a-Mentor-A-Guide-for-Higher-Education-Faculty-Second-Edition/Johnson/p/book/9781138892279

[19]   C. A. Mullen and J. L. Hutinger, "At the tipping point? Role of formal faculty mentoring in changing university research cultures," *J. -Serv. Educ.*, vol. 34, no. 2, pp. 181–204, Jun. 2008, doi: 10.1080/13674580801951012.

[20]   J. H. Yun, B. Baldi, and M. D. Sorcinelli, "Mutual Mentoring for Early-Career and Underrepresented Faculty: Model, Research, and Practice," *Innov. High. Educ.*, vol. 41, no. 5, pp. 441–451, Nov. 2016, doi: 10.1007/s10755-016-9359-6.

[21]   S. D. Museus, M. C. Ledesma, and T. L. Parker, "Racism and Racial Equity in Higher Education," *ASHE High. Educ. Rep.*, vol. 42, no. 1, Nov. 2015.