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Hiring Practices to Build a Diverse Team at Wakr Forest Engineering: Transforming Engineering Education and Broadening Participation in Engineering is Possible!

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Dr. Olga Pierrakos is a STEM Education Program Director at the National Science Foundation and a Professor at Wake Forest Engineering. She is the Founding Chair of Wake Forest Engineering (2017-2022) who led the program from launch to accreditation achieving unprecedented outcomes, including Wake Forest Engineering becoming the most diverse, most innovative, and highest ranked academic unit at Wake Forest University. Olga is a national thought leader in higher education and engineering education. She is a biomedical and mechanical engineer as well as an STEM education researcher.

Inclusive and Bias-Minimizing Hiring Practices to Build a Diverse Team at Wake Forest Engineering: Transforming Engineering Education through Faculty Diversity and Broadening Participation

This paper presents a comprehensive case study of Wake Forest Engineering's successful launch and transformation to build a diverse faculty team to support innovation across curriculum, pedagogy, research, and community impact. By implementing research-grounded hiring practices focused on minimizing bias and promoting inclusion, the department achieved remarkable diversity metrics: 50% women faculty, 25% racial/ethnic diversity, and representation from over 12 engineering disciplines including educational researchers, social scientists, and humanists. These faculty demographics catalyzed student body diversity (40% women, 25% racial/ethnic diversity) and elevated the program to become the highest-ranked academic unit at Wake Forest University. The paper details over eighteen evidence-based and research-grounded hiring strategies across key phases of the hiring process (position ad, recruitment, screening, interviewing, onboarding, continuous improvement) to support the building of a diverse faculty team. This collective set of strategies present a tested model of hiring practices that can be leveraged by other engineering programs and other higher education departments seeking to transform their faculty recruitment processes and build more inclusive academic environments that better serve an increasingly diverse student population. These strategies can benefit not only new departments but also existing ones. Recruiting, hiring, and developing diverse faculty teams is possible and essential to supporting a diverse student population. There is urgency in this work for the betterment of higher education and engineering education.

I. INTRODUCTION

The lack of diversity within the engineering profession, including engineering academic environments, is well known. The challenges that higher education faces, and many organizations face, in recruiting diverse talent is also known. According to ChatGPT 4.0 (September 2, 2024) and edited to be represented in a figure format (**Figure 1**), we highlight just some of the challenges that hinder organizations from building diverse teams. Some of these challenges that hinder higher education and hinder engineering education too include:

- Biases in Recruitment Processes
- Biased Institutional Barriers and Practices
- Misalignment of Goals and Practices
- Resistance to Change
- Company Culture and Lack of Inclusivity
- Resource Constraints to Implement Effective Strategies
- Lack of Diversity Existing in the Organization

The process of achieving diversity in recruitment presents a complex challenge. Unconscious biases can hinder the process, leading to unintentional favoritism towards certain groups. Additionally, limited talent pools in certain industries or regions can restrict the availability of

diverse candidates. Creating an inclusive company culture is crucial for attracting and retaining diverse talent. A welcoming and supportive environment is essential to ensure that employees from diverse backgrounds feel valued and have equal opportunities for growth. However, resistance to change within organizations can impede progress towards a more diverse workforce. Implementing effective diversity strategies requires significant resources, including time, money, and expertise. Smaller organizations may face particular challenges in this regard. Furthermore, companies may encounter external scrutiny or skepticism if their diversity efforts are perceived as superficial or tokenistic. Finally, navigating the legal complexities of diversity hiring, such as affirmative action requirements, is essential to avoid legal issues and maintain a fair and equitable hiring process.

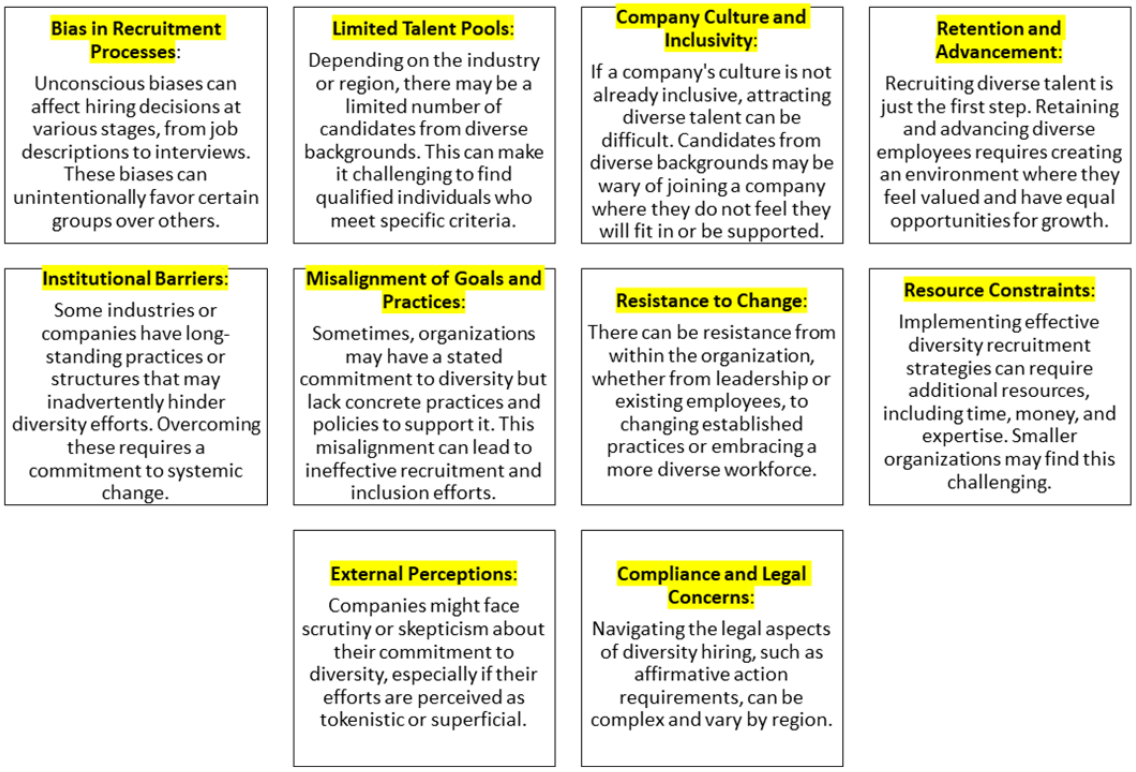

Figure 1: Example set of challenges that exist in higher education and that hinder the hiring of diverse teams. AI (Chat GPT) derived content but author produced visual.

Addressing such challenges proactively, intentionally, and effectively can truly lead to more innovative and inclusive workplaces (Metinyurt 2021). Addressing these challenges requires strategic planning, leadership, ongoing training, ethical decision making, and a genuine effort to create an inclusive culture. The purpose of this paper is to highlight some of the strategies used in building Wake Forest Engineering and what has now become one of the most diverse academic units on the Wake Forest University (WFU) campus and the highest ranked (US News Report 2023) academic unit on campus. Despite WFU being a predominantly white institution, Wake Forest Engineering as one of the newest academic units on campus adopted hiring practices that enabled the hiring of a very diverse engineering faculty team – over 50% female

faculty, 25% racial and ethnic diversity, engineering disciplinary diversity, etc. **Broad representation in the faculty body was a strategic goal as a means to recruit a diverse student body which was also achieved.** Intentionality in ethical, inclusive, and bias-minimizing practices required Wake Forest Engineering to use evidence-based approaches to equitable, inclusive, and bias free recruitment, hiring and retention enables organizations to diversity their workforce and innovate. The strategies used and presented herein apply to all of higher education and all engineering education.

It is thus an ***ethical imperative*** for the people who are representing higher education at all levels (administrators, faculty, staff) to represent the communities they serve. With student demographics changing and evolving, it is an imperative for higher education institutions to continue diversifying their workforce at all levels to ensure that the demographics of their student body are represented in the organization. When an organization represents the communities they serve, the impacts are more positive and innovation can thrive.

II. TRADITIONAL VS ETHICAL & INCLUSIVE HIRING PRACTICES

Across organizations, including higher education organizations, we continue to see outdated hiring practices that are filled with bias, lack evidence-based practices and strategies, and continue to prolong the lack of diversity and lack of broadening participation. **Table 1** presents a comparison of traditional (and often outdated) hiring practices versus ethical and inclusive hiring practices we might see in higher education and other organizations. Content for this table was derived from Claude AI (December 18, 2024) and edited as well as re-organized into categories by the author. To complement the AI derived practices, below is also a list of literature derived strategies that have been used by organizations to mitigate the challenges to building diverse teams. Such evidence-based strategies can help us advance diversity, equity, and inclusion initiatives in higher education also.

Recruitment, Screening, and Interview Phases:

- Regular bias training (Gino and Coffman, 2021; Applebaum, 2019)
- Broad recruitment across historically excluded groups (Cosgriff-Hernandez et al., 2022)
- Structured interviews (Levashina et al. 2014; Williamson et al., 1997)
- Blind resume screening (Derous and Ryan 2019)
- Standardized evaluation criteria (Isaac et al., 2009; Reilly and Chao, 1982)
- Multiple evaluators (Fine et al., 2014; Isaac et al., 2009)
- Cross-functional teams (Homan et al., 2020; Majchrzak et al., 2012)
- Inclusive leadership development (Luthra and Muhr, 2023; Nishii and Leroy, 2022)

Onboarding Phase:

- Clear promotion criteria (Russell, Brock, and Rudisill, 2019; Whysall, 2018)
- Transparent pay structures (Woods and Tharakan, 2021)
- Formal mentoring programs (Willems and Smet, 2007; Ehrich et al., 2004)
- Employee resource groups (Wynn and Correll, 2018; Berrey 2014)
- Cultural awareness programs (Carter et al. 2020; Hall and Theriot, 2016)

Post Hiring Phase:

- Regular diversity audits (Chun and Evans, 2023; Chesler, 1998)
- Outcome tracking (Bol and Van de Werfhorst, 2016)
- Leadership accountability metrics
- Climate surveys (Moreu et al., 2021)

Table 1: A comparison of traditional versus ethical and inclusive hiring practices across various phases of hiring. Adopted and revised from content generated by Claude AI (Dec. 18, 2024)

	Traditional Hiring Practices	**Ethical and Inclusive Hiring Practices**
Job Ad Phase	• Long lists of "required" qualifications • Industry-specific jargon • Emphasis on years of experience • Unclear or subjective requirements • Generic diversity statements	• Focus on essential skills and competencies • Clear, accessible language • Separation of required vs. preferred qualifications • Inclusive language and terminology • Explicit mention of accommodations available • Transparency about salary ranges • Authentic commitment to diversity and inclusion
Outreach Phase	• Reliance on standard job boards • Word-of-mouth recruiting • Passive posting and waiting for applications • Limited outreach channels	• Multiple diverse recruiting channels • Partnerships with organizations serving underrepresented groups • Proactive sourcing of diverse candidates • Presence at diverse professional events • Use of technology to reach broader candidate pools
Screening Phase	• Heavy emphasis on credentials and years of experience • Reliance on prestigious institutions/companies • Focus on "culture fit" • Network-based referrals from existing employees • Resume screening based on keywords and basic qualifications	• Skills-based assessment and potential • Recognition of transferable skills and diverse experiences • Focus on "culture add" - what new perspectives candidates bring • Structured referral programs with diversity goals • Blind resume screening removing identifying information • Consideration of non-traditional paths and experiences
Interview Phase	• Unstructured interviews • Informal conversations • Single interviewer decisions • Heavy reliance on "gut feeling" • Similar questions for all candidates but no standardization • Focus on personality and likeability	• Structured behavioral interviews • Standardized evaluation criteria • Diverse interview panels • Evidence-based assessment methods • Job-relevant skills testing • Same questions asked in same order to all candidates • Focus on competencies and capabilities

Decision Making Phase	• Quick decisions based on immediate impressions • Individual hiring manager preferences • Limited documentation of reasons • Informal consensus building • Bias toward candidates similar to existing team	• Data-driven decision making • Multiple stakeholder input • Documented evaluation criteria • Structured deliberation process • Regular bias check-ins • Focus on complementary skills and perspectives
Onboarding	• Standard orientation process • One-size-fits-all approach • Focus on paperwork and procedures • Limited support for integration	• Personalized onboarding plans • Consideration of individual needs • Mentorship programs • Resource groups and support systems • Regular check-ins and feedback • Accommodation processes clearly communicated
Post Phase	• Focus on time-to-hire and cost metrics • Limited tracking of diversity data • No formal review of hiring practices • Reactive approach to problems	• Regular review of diversity metrics • Analysis of dropout rates at each stage • Feedback collection from all candidates • Assessment of long-term outcomes • Continuous improvement process • Proactive identification of barriers

III. INHERENT BIASES DURING HIRING PRACTICES

While we are becoming more aware that not all hiring practices are created equal and we have grown in our understanding of more effective, more ethical, more inclusive practices informed by evidence, it is also imperative to understand what continues to hold us back - biases. Hiring processes can be rife with biases, whether conscious or unconscious. Knowing the biases that are inherent during hiring processes can help us mitigate these biases during the process too and help us develop strategies to mitigate inherent biases.

According to Chat GPT 4.0 (September 2, 2024), some common types of bias include the following (**Table 2**) and many of these biases are supported by academic literature (Hardy et al, 2022; Esposito 2021; O'Meara et al., 2020; Tugend 2018; Kayes 2006; Marlowe et al., 1996).

To mitigate such biases, organizations can and should implement a variety of bias-mitigating strategies such as structured interviews, use standardized evaluation criteria, incorporate diverse hiring committees, etc. Training on unconscious bias and promoting inclusive practices can also help create a more equitable hiring process. Some of these bias-minimizing strategies according to Chat GPT 4.0 (September 2, 2024) are shown in **Table 3** and such strategies help create fair and inclusive workplaces. Such strategies can indeed offer value to higher education and engineering education hiring practices too.

Table 2: Biases inherent in hiring processes by Chat GPT 4.0 (September 2, 2024).

Bias Type	Description
Affinity Bias	Favoring candidates who share similarities with hiring personnel, leading to a lack of diversity and missed opportunities for different perspectives.
Confirmation Bias	Seeking out information that confirms pre-existing beliefs or stereotypes about a demographic group, rather than objectively evaluating all evidence.
Gender Bias	Favoring one gender over another, such as preferring male candidates for leadership roles or interpreting behaviors differently based on gender.
Racial and Ethnic Bias	Making assumptions or stereotypes based on a candidate's race or ethnicity, affecting decisions in subtle ways, such as differing levels of scrutiny or expectations.
Age Bias	Bias against older or younger candidates, perceiving older candidates as less adaptable or tech-savvy, and younger candidates as inexperienced or lacking maturity.
Name Bias	Resumes with ethnically distinct names receiving less favorable consideration compared to those with more common names, leading to disparities in interview opportunities.
Educational Bias	Favoring candidates from prestigious universities or specific academic backgrounds, potentially overlooking qualified individuals from less well-known institutions or non-traditional educational paths.
Socioeconomic Bias	Judging candidates based on assumptions about their work ethic or skills influenced by their socioeconomic background, which can affect their educational and professional opportunities.
Halo Effect	Assuming a candidate who excels in one area will excel in other unrelated areas, skewing the assessment of their overall suitability for the role.
Horns Effect	Allowing a noticeable flaw or poor impression in one aspect to unfairly influence the evaluation of a candidate's entire candidacy.

Table 3: Strategies to create fair and inclusive workplaces by Chat GPT 4.0 (Sept. 2, 2024).

Strategy	Description
Structured Interviews	• **Use a Consistent Format**: Develop a standard set of questions and evaluation criteria for all candidates. • **Behavioral Questions**: Focus on past experiences to provide objective insights.
Diverse Hiring Panels	• **Varied Perspectives**: Include individuals from diverse backgrounds. **Bias Training**: Train panel members to recognize and mitigate biases.
Blind Recruitment	• **Anonymize Resumes**: Remove personal information during initial screening. • **Standardized Assessments**: Use unbiased skills assessments or tests.
Clear Job Descriptions	• **Focus on Skills and Requirements**: Emphasize essential skills and experiences. • **Inclusive Language**: Use gender-neutral and welcoming language.
Unconscious Bias Training	• **Education and Awareness**: Provide training to recognize and address biases. • **Ongoing Learning**: Make it a continuous part of professional development.
Data-Driven Decisions	• **Track Metrics**: Monitor hiring data for disparities or trends. • **Evaluate and Adjust**: Regularly assess and adjust practices based on data and feedback.
Inclusive Recruitment Channels	• **Widen Your Network**: Use diverse recruitment sources and job boards. • **Community Engagement**: Partner with organizations supporting underrepresented groups.
Candidate Experience	• **Fair Process**: Ensure a respectful and consistent experience for all candidates. • **Feedback Mechanism**: Allow candidates to provide feedback on their experience.
Objective Evaluation Criteria	• **Develop Metrics**: Create clear, objective criteria aligned with job requirements. • **Avoid Subjective Judgments**: Focus on measurable skills and qualifications.
Regular Reviews	• **Audit Practices**: Regularly review hiring practices and outcomes. • **Continuous Improvement**: Implement changes based on audit findings to reduce bias.

IV. INSTITUTIONAL CONTEXT

The author (Pierrakos) was appointed Founding Chair of Wake Forest Engineering in January 2017 and arrived on site at Wake Forest University (Winston Salem, North Carolina) to launch and lead the new program in July 2017. Wake Forest Engineering welcomed its inaugural cohort

of engineering students in August 2017. Three founding faculty (one recently tenured Associate and two Assistant Professors) started in July 2017 and Pierrakos was part of the search committee to hire this group of founding faculty. No website, no 4-year curriculum, no operating budget, no furniture, no equipment, and no distinct vision existed at launch (July 2017). Home for Wake Forest Engineering was Wake Downtown, a newly renovated academic building that used to be an old tobacco warehouse. About 13,000 sq ft of partially built out spaces existed for Engineering to start offering courses, supporting faculty research, and other activities for the new program. Previous publications describe the launch of Wake Forest Engineering in more detail (Pierrakos, 2024; Pierrakos and Kenny, 2025).

Because students came to Wake Forest University with very diverse interests across many engineering applications and interests beyond engineering meant that a new strategy had to be developed during hiring and to support an interdisciplinary engineering curriculum. More specifically, via entrance surveys and frequently gathering data from students (Pierrakos, 2024), we discovered from the first months of launching Wake Forest Engineering that students had very diverse engineering interests across many engineering applications including biomedical engineering, civil engineering, environmental engineering, mechanical engineering, electrical engineering, systems engineering, computer engineering, materials engineering, etc. As a result, Wake Forest Engineering offers one BS Engineering degree (the original plan) that needed to be more interdisciplinary given student interests and now offers five optional engineering concentrations (instituted fall 2021). Given these diverse interests across engineering applications, it became clear early on that faculty from across diverse engineering disciplines and with both traditional and non-traditional journeys would need to be recruited and hired. We needed to model to the Wake Forest engineering students what is possible with an interdisciplinary engineering undergraduate degree and this modeling would be showcased by the diverse career pathways of the faculty body. After all, students came to Wake Forest University to combine a traditional liberal arts education with the innovation of an engineering degree. Students wanted to use their engineering degree for both engineering and non-engineering pathways and diverse professional pathways. Students wanted a technical engineering degree but had unique interests to combine general knowledge, engineering disciplinary knowledge, and professional knowledge. Faculty with both traditional academic journeys and faculty with industry experience would need to be recruited and to be united around a common vision, mission, and values of the new department. As will be visible by the end of this paper, a diverse team was recruited and hired to build Wake Forest Engineering. Please see prior publications for additional situational context around vision setting, value setting, curriculum development, etc. (Pierrakos, 2024).

As Founding Chair of Wake Forest Engineering (2017 to 2022), the author of this paper oversaw all hiring processes for the new department starting in July 2017 until December 2022 and this involved overseeing these steps: staffing requests, negotiations with the Dean's Office (no engineering expertise), job ad preparation, job ad advertisement, search committee formation and training, search process oversight and procedures, interviewing, hiring negotiations, onboarding, mentoring, documentation, etc. Pierrakos was also part of the search committee to hire the three founding faculty spring 2017 who joined July 2017. It is important to note that neither the College nor University had documented hiring procedures and processes to guide search committee, thus Pierrakos having to develop her own.

Wake Forest University Admissions was predicting (from admissions data) about 26 students to enroll in the first Wake Forest Engineering class in the fall 2017 semester, but 55 students ended up enrolling in the augural class fall 2017. The upper administration had communicated with Pierrakos that graduating 10-15 inaugural engineering graduates in May 2022 would be a success. The reality was that Wake Forest Engineering graduated 43 inaugural graduates May 2021, 45 graduates in 2022, and so on. All this to show that Wake Forest Engineering launched with higher enrollments than the university had predicted and within three years, Wake Forest Engineering had nearly 200 unique students enrolled in engineering classes. Wake Forest Engineering became one of the largest departments in student size in a College of 30 departments and 26 interdisciplinary programs (College of Arts and Sciences). With enrollment growth came responsibility to hire a faculty and staff team to support the new department with delivering an outstanding engineering education experience for students and supporting the diverse research interests of the tenure-track and tenured engineering faculty, who were expected to spend 40% of their time conducting research. The hiring practices that guided the hiring of Wake Forest Engineering faculty are described in the next section. As will be visible in later sections, the hiring practices at Wake Forest Engineering were informed by evidence-based practices, research-informed practices, and Pierrakos's experiences as a founding engineering faculty at James Madison University and a Program Director at the National Science Foundation (NSF). Pierrakos witnessed firsthand the hiring practices in higher education and a federal agency. Most influential to Pierrakos were the hiring practices she witnessed and learned at NSF, an organization that embodied higher standards, higher compliance and accountability procedures, more authentic broadening participation goals, immense bias training, and many bias-minimizing hiring practices. NSF's more diverse workforce is evidence of the higher standards compared to the workforce diversity we see in higher education.

Lastly, it is important to note that when Pierrakos joined Wake Forest University to build Engineering, there were minimal resources available to hiring committees in support of equitable and inclusive hiring practices. Each department did their own thing and uninformed by research grounded and evidence informed hiring practices. Only in the last few years has Wake Forest University offered some virtual training to hiring managers with some practices that are informed by research and evidence. Because no university resources were available to Pierrakos, she drafted a hiring handbook to guide search committees in engineering through the process. The content in the next section is content from this hiring handbook Pierrakos prepared and continuously improved from one year to the next.

V. HIRING PRACTICES AT WFU ENGINEERING

In this section, the hiring process Pierrakos instituted and implemented in hiring a diverse Wake Forest Engineering team is showcased. Content herein is adopted from the *WFU Engineering Hiring Handbook* that Pierrakos prepared as Founding Engineering Chair to guide hiring. The WFU Engineering Hiring Handbook was shared with all search committee members. Every step required intentionality around minimizing bias which is inherent in hiring processes.

Step 1. Getting the Job(s) Posted

Upon position approval by the College Dean's Office, a draft position was prepared and shared with the faculty/staff team for feedback. Upon department-level edits being addressed, the

position ad(s) were shared with the Dean's Office who provided final approval prior to posting. Working with HR, the job ad(s) are posted and advertised. All WFU positions get automatically posted on *InsideHigherEd* and HR Staff are responsible for dissemination to these venues. WFU Engineering faculty positions were also posted in the following venues and also shared with the Engineering faculty/staff team to further disseminate to other professional communities: Academic Keys, Chronicle of Higher Education, American Society for Engineering Education (ASEE), ASEE Divisions (CED, WIED, DEED, MIND, ERM, LEES, etc.), Society of Women Engineers (SWE), National Society for Black Engineers (NSBE), National Society for Professional Engineers (NSPE), Professional Engineers societies, etc.

Figure 2 shows an actual Wake Forest Engineering faculty ad from fall 2018. The content of this faculty ad shows vision, values, and inclusion. The ad has some elements that one would not typically see in a faculty ad, including (a) departmental values upfront and visibly clear, (b) a section describing our uniqueness and a vision of the kind of engineering program we are launching, (c) a section describing a vision of who we want. The ask for the candidates also demonstrate inclusion and an invitation to align with the vision and values of the department.

Step 2. Forming the Search Committee(s)

The Engineering Chair worked to form an appropriate and diverse search committee for each position. This diversity is reflected in disciplinary expertise, gender, rank, race, ethnicity, etc. Incredible intentionality was needed in this step with a recognition that inherent and unconscious biases may exist with search committees and committee members. If a search committee is all white men, the outcome will be the selection of a white man as the top candidate. Research has shown this time and time again. I ensured that diversity in gender, race, ethnicity, and rank existed in a search committee. When I was not able to bring enough diversity to the search committee from within the department, I would invite colleagues from other STEM departments to be part of the search committee. I formed search committees with colleagues from Computer Science, Biology, Physics, and even Health Exercise Science. In cases where we were hiring senior faculty (Associate or Full Professor), I witnessed biases in an all-engineering faculty search committee and ultimately failed a search one year because I saw that diverse candidates with high achievements were not being selected to even make the short list. Biases were coming from Assistant Professors and junior Associate Professors who knew that the candidates to be selected could become the people that would be voting on their tenure and promotion cases. Such biases are not malicious but natural. The key was and is to mitigate such biases and I did so by inviting two senior faculty (full professors and previous department chairs) to be part of the search committee in the year that followed for a search at the Associate Professor level. Bringing higher ranked faculty from other departments made the difference to identify and hire candidates with high achievement and diverse backgrounds. In summary, it is not trivial who is placed on a search committee and yet one of the most critical decisions that can be made by an academic leader. It is essential to bring together a diverse group on search committees and ideally folks from other departments because conflicts of interest, affinity bias, and confirmation bias within a department can adversely impact screening and candidate selection.

Assistant Professor (Tenure Track Position), Wake Forest University Department of Engineering

The new Department of Engineering at Wake Forest University invites applications ***at the rank of Assistant Professor in any engineering area*** to begin in the fall semester of 2019. The successful candidate will be appointed to a tenure-track position in the Department of Engineering and will help establish the new undergraduate engineering program. We seek a colleague who will diversify our team through their scholarly pursuits and will provide significant educational contributions in support of our students' development as engineers. We seek a colleague who is excited about building a new program that embodies the values of *empowerment, integrity, inclusion, compassion, growth, and joy* in every layer of our fabric (i.e., faculty-student interactions, faculty-faculty interactions, promotion and tenure guidelines, curriculum development, space design, etc.). Further information is available at college.wfu.edu/engineering/.

Wake Forest University (WFU), a top-30 nationally ranked university located in Winston-Salem, North Carolina, welcomed its inaugural class of engineering students in August 2017. As a collegiate university, WFU combines the tradition and intimacy of a small liberal arts college with the innovation and vitality of a research university. The Department of Engineering is the anchor program at the new Wake Downtown campus, located in WFU's Innovation Quarter in downtown Winston-Salem, which serves as a convenient extension of the main WFU Reynolda campus with frequent shuttle service linking the campuses. Wake Downtown opened its doors in January 2017 and is a splendid canvas upon which to design and build a world-renowned engineering program. Embracing WFU's culture as a leading collegiate university in the US [http://www.wfu.edu/visitors/quickfacts.html], the new Department of Engineering is part of the undergraduate College, which prides itself in realizing the university motto of *Pro Humanitate* (for humanity) through its commitment to the engaged liberal arts and the teacher-scholar ideal.

Who We Are - In the nation, we are the only BS Engineering program (with undergraduate students only), grounded in the liberal arts at a research university. This unique combination not only defines who we are, but defines our unique characteristics. Our students will graduate with a BS in Engineering and have an exemplary undergraduate experience infused with the liberal arts. We strive to be a leader in undergraduate education with primary motivations being: innovation in the curriculum, effective learning methods, and an authentic liberal arts curriculum to educate the whole person, featuring a project-based curriculum that emphasizes creative design and community partnerships. Currently, the department has 7 faculty and 130 students (42% female and 20% minority). Our vision for our engineering students is to help them become (a) leaders and agents of change embodying the WFU motto of *Pro Humanitate* (for humanity), (b) active seekers and creators of knowledge, (c) empowered with the engineering fundamentals but also strengthened with the breadth of an exceptional liberal arts education, (d) adaptive experts who recognize the strengths and limits of her/his knowledge and her/his team, (e) innovators by embracing inclusion, diversity, and equity, and (f) fearless in the face of complex problems.

Who We Want - We are seeking a colleague who shares this vision, who embodies the same attributes we desire in our students, and who wants to contribute to an educational environment that emphasizes excellence in engineering, creative design and problem solving, and broad societal impact. Faculty members are expected to be engaged teacher-scholars who: (1) teach introductory and advanced engineering classes at the undergraduate level; (2) teach first year and upper-level interdisciplinary topical courses to majors and nonmajors alike; (3) establish a vigorous, externally supported research program (in domains that could include fundamental and applied engineering as well as teaching and learning) that will include undergraduate students in meaningful projects; and (4) serve the department and university through student advising, undergraduate mentoring, active participation in faculty governance, and establishing links to industrial and community partners. All faculty are expected to participate in and support the department's curriculum and program design, space and laboratory design, and assessment and accreditation efforts. Specifically, because the Department of Engineering and its student body are in the founding phase, applicants should be prepared for and excited about the extra opportunities and challenges that this start-up process necessarily entails. Applicants should have a Ph.D. in an engineering or complementary discipline.

What To Submit - Interested applicants should apply via the University's career website at: http://www.wfu.careers/. The application should be submitted as **ONE PDF file** and include the following: (1) a **cover letter** that addresses the applicant's motivation to be a founding faculty member, personal values in alignment with the department values, and vision for building a modern, interdisciplinary engineering program; (2) a **CV** with an accompanying list of 3-5 references representing supervisors, students, and staff; (3) a **teaching statement** that addresses the candidate's philosophy on teaching and learning as well as a plan to establish an inclusive classroom culture and one that infuses the liberal arts; (4) a **scholarship statement** that describes the candidate's ideas and plans for scholarly pursuits, impact, and professional growth within an undergraduate program; and (5) a **professional service statement** that describes the candidate's interests and plans in serving the department, university, profession, and society. Aside from the CV, all other documents should not exceed 2 pages each. References will only be contacted with prior approval of the applicant. **Review of applications will begin on December 15, 2018**, and will continue until the positions are filled with new applications reviewed on a regular cycle. Further information is available at college.wfu.edu/engineering/.

Inquiries about the application process and document submission may be addressed to wakejobs@wfu.edu. Inquiries about the position in general can be directed to Mrs. Cathy Bailey (baileyc@wfu.edu - Department of Engineering Administrative Assistant), who will direct the inquiry to the appropriate engineering faculty. Wake Forest University is a highly ranked, private university with 5100 undergraduates and 3000 graduate and professional students in the Schools of Medicine, Law, Divinity and Business. Wake Forest University welcomes and encourages diversity and inclusivity, and seeks applicants with demonstrated success in working with diverse populations. Wake Forest University is an AA/EO employer and values an inclusive and diverse learning community and campus climate.

Figure 2: Actual Wake Forest Engineering faculty ad from 2018. Prepared by Pierrakos and feedback solicited from all engineering faculty and staff.

Step 3. Conflict of Interest, Confidentiality, and Bias Training

Having spent two years at the National Science Foundation (NSF) as a Program Director prior to joining WFU and WFU Engineering, Founding Chair (Pierrakos) had immense amount of training with bias minimizing practices, ethics, conflict of interest, and confidentiality. This training at NSF was far superior and immersive to what she had experienced at two prior academic institutions and at WFU. Academic institutions offer minimal (or none) training around bias, conflict of interest, confidentiality, ethics, etc. compared to NSF that is a federal agency. During the inaugural year of launching WFU Engineering, Founding Chair (Pierrakos) instituted training for all members of the search committee and all those involved in the hiring process that reviewed applications and evaluated candidates. At that time, WFU offered no such training to hiring committees and no guidance to hiring committees on equitable, inclusive, and bias minimizing practices. The Founding Engineering Chair informed the Search Committee Chairs of their responsibility to uphold a focus on equity throughout the review process. If any concerns by anyone involved in the search and hiring process arose, those concerns needed to be shared with the Founding Engineering Chair and Search Committee Chair. All those involved in the search and hiring process were responsible to uphold values of equity throughout the process. The following figures (**Figures 3, 4, and 5**) from NSF ADVANCE research and resources were shared with search committees.

Prior to reviewing any applications, all members of the Search Committee needed to review the pool of candidates and ***identify any potential conflicts of interest***. Conflicts of interest would involve applicants reflecting prior collaborations with a Search Committee member and that might lead to bias (positive or negative) towards the application (positive or negative). Again, this was a practice learned at the NSF. Examples of conflict of interest include a professional partnership, a personal friendship, family relationship, etc. Conflicts of interests needed be discussed and resolved in coordination with the Search Committee Chair and the Founding Engineering Chair (Pierrakos). Based on the severity of the COI, a search committee member would either be asked to leave the room during discussion of a particular application or removed from the search process. This is a major area of importance in higher education, which is often not incorporating COI training and standards as part of hiring processes. This becomes evident during search committee deliberations when committee members bring biased views of candidates they know or favor or not favor. It is thus essential for trained equity and bias experts to be in the deliberations. During one year, I brought in such an expert to the search process because I witnessed biased comments and remarks by committee members. Statements like "I don't think this candidate can teaching XXX class," "I don't believe this candidate can work with others in the department." "I have heard that this candidate is perceived negatively by peers." All these are examples of biased statements that are not grounded on any direct evidence and thus should be removed from search deliberations. This is why one year I invited an equity and bias expert from the Wake Forest University Office of Diversity and Inclusion (ODI) to be part of the search committee when we were hiring 3 faculty. I had asked her to guide us in our processes and with deliberations to ensure we were not demonstrative bias. As an engineering non-expert, she was the perfect committee member because she could challenge us with questions that should not offend engineering faculty because she did not know the engineering context. What she was an expert on was hearing biased and unsubstantiated statements. Bringing an equity and bias expert was a just-in-time way to train my young team through this experiential process of hiring. This equity and bias expert was providing my Wake Forest Engineering team

just-in-time coaching and professional development. Unfortunately, due to ODI staffing demands, I was not able to sustain this strategy - bringing a bias and equity expert to a search.

WFU received applications in confidence and needed to protect the ***confidentially*** of applicant identities and protect the content of their applications. Search Committee members were not allowed (and asked not to) to disclose any details about the applications or the internal deliberations of the committee. Prior to reviewing applications, all those involved with the search and hiring process needed to review a confidentiality statement and the Search Committee Chair uphold the highest standards in the process to ensure the integrity of the search process and to ensure the confidentiality of the candidates. All deliberations would need to take place with the entire Search Committee and not outside of the formal venues upon which the Search Committee operates. At the end of the search process, when successful candidates have been hired, Search Committee members would need to delete and destroy all application materials. Details like these are often ignored and not part of hiring processes in higher education, even though confidentiality and common standards around deliberations are so essential. What we see in many organizations, including higher education, is watercooler conversations about candidates being discussed outside of the full committee which has many bias pitfalls.

Sometimes also referred to as ***implicit (unconscious) or explicit (conscious) biases***, we all come to the table with stereotypes that operate automatically (unconsciously) when we interact with people, evaluate applications, etc. These automatic operations are built into the brain's "short circuit" for the simple reason of making decisions faster. Implicit biases may be positive or negative and may be shared across groups. To minimize evaluation bias, there are four strategies to be aware of: (1) increase awareness of how schemas might bias evaluation, (2) decrease time pressure and distraction in evaluation processes, (3) rate on explicit criteria rather than global judgements, and (4) point to specific evidence supporting judgements. All Search Committee members needed to review these documents prior to evaluating applications. The Search Chair was responsible for upholding a keen focus on minimizing bias and ensuring equity.

Step 4. Identifying the "Short List" Candidates

The application review process encompassed three steps to get to a "short list" of candidates to proceed to a virtual interview phase. These three steps are outlined herein: (1) Application Compliance Checking, (2) Establish Evaluation Criteria, and (3) Individual Evaluation of Applications. The Search Committee Chair and members of the search committee would review applications in alignment with the position description for application compliance checking. Incomplete applications could be removed from the pool of applications. After that, the Search Committee Chair in consultation with the Founding Engineering Chair would develop a set of criteria that the Search Committee members would use in the evaluation of applications. These evaluation criteria would need to be based on the position ad and program needs. Examples of criteria that have been used with hiring of WFU Engineering faculty searches are as follows: (1) Embraces a Liberal Education (even in the context of engineering education), (2) Diversity of Scholarship (with a student focus) to complement the current engineering team, (3) Curricular Versatility and Innovation, (4) Ability and Willingness to be Founding Team Member, (5) Evidence of Inclusion and Seeking Diversity. These criteria would require definitions and examples of evidence that would align with the criteria. Definitions were refined and improved from one year to the next and search committee members spent time aligning on these criteria.

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Search Committees: Minimizing the Role of Unconscious Bias

What is unconscious bias?

- Social stereotypes about certain groups of people that individuals form outside of their own consciousness[1]
- Everyone has it - stems from our tendency to organize our social worlds by categorizing
- Pervasively influences hiring, evaluation, selection of candidates and even daily interactions in favor of men, whites, youth, and physically able[2]

What can you do?

- Deepen the pool
  - Women and minorities are judged most fairly when they make up at least 30% of the candidate pool[3]
- Take steps to reduce/eliminate bias
  - Allow sufficient time for evaluating and hiring[4]
  - Use structured criteria and decision processes[5]
  - Know the relevant research[6]
- Become aware of your own biases and take the Implicit Association Test at https://implicit.harvard.edu/implicit/
- See the AAMC's E-Learning Seminar on unconscious bias in the search & recruitment process at: http://www.aamc.org/opi/leadership/training.htm
- Check out the Gender Bias Learning Project and play Gender Bias Bingo at: http://www.genderbiasbingo.com/games.html
- See the evaluation, hiring, and unconscious bias sections of our website at http://advance.arizona.edu/resources.cfm for more tips and resources

[1] Fiske &Taylor, 1991; Valian, 1998;1999
[2] Bauer & Baltes, 2002; Butler & Geis, 1990; Correl et al, 2007; Heilman et al, 2004; Hummert et al, 1994; Ito & Urland, 2003; King et al, 2006; Kite & Johnson, 1988; Martell, 1991; Norton et al, 2004; Porter & Geis, 1983, Slackett et al, 1991; *and more!*
[3] Heilman, 1980; Sackett et al, 1991; Valian, 1998
[4] Martell, 1991; Blair & Banaji, 1996
[5] Martell & Guzzo, 1991
[6] Moskowitz et al, 1999

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Figure 3: Bias minimizing resource shared with search committees.

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AVOIDING BIAS IN READING & WRITING EVALUATIONS

evaluations may differ systematically based on gender or race/ethnicity

Descriptive words **may be used differently in evaluating members of different social groups**:

- **Grindstone adjectives** - (*hardworking, conscientious, dependable, meticulous, thorough, diligent, dedicated, careful*) – are sometimes used more for women, implying that women succeed more through effort than ability.
- **Ability traits** – *talented, smart, able, capable, brilliant*
- **Standout adjectives** – *best, superior, excellent*

Descriptive phrases **can unintentionally influence a reader.**

1. **Using first names for women** or minority faculty and titles for men (*Joan* was an asset to our department." –vs. - "*Dr. Smith* was an asset to our department.")
2. **Gendered adjectives** ("Dr. Sarah Gray is a *caring, compassionate* physician" –vs. – Dr. Joel Gray has been very *successful with his patients*")
3. **Doubt raisers** or negative language ("although her publications are not numerous" or "while not the best student I have had, s/he")
4. **Potentially negative language** ("S/he requires only minimal supervision" or "S/he is totally intolerant of shoddy research")
5. **Faint praise** ("S/he worked hard on projects that s/he was assigned" or "S/he has never had temper tantrums")
6. **Hedges** ("S/he responds well to feedback")
7. **Irrelevancy** ("S/he is an avid skier and stamp collector")
8. **Unnecessarily invoking a stereotype** ("She is not overly emotional"; "He is very confident yet not arrogant"; or "S/he is extremely productive, especially as someone who attended inner city schools and a large state university"

Based on: Trix & Psenka , 2003; Schmader, Whitehead, & Wysocki, 2007; and Women in Science & Engineering Leadership Initiative (WISELI), University of Wisconsin, Madison, Handout on Reviewing applicants: Research on Bias and Assumptions.

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Figure 4: Bias minimizing resource shared with search committees.

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BEST PRACTICES

to minimize bias in the evaluation of faculty

1. ***Allow sufficient time for evaluations,*** because evaluators draw on stereotypes more when rushed or distracted. Take time to evaluate each candidate's entire file; don't depend too heavily on only one element. (Martell, 1991; Bauer & Baltes, 2002).

2. ***Develop criteria for evaluation and apply them consistently to all faculty.***

    a. Structured *criteria* for decision-making result in more accurate evaluations (Martell & Guzzo, 1991).

    b. Structured *processes* for recording observations increase accuracy and reduce bias (Bauer & Baltes, 2002).

3. ***Learn to recognize bias in written evaluations*** and how to minimize bias when writing evaluations (Trix & Psenka, 2003).

4. ***Evaluations that describe specific behaviors***, rather than overall evaluations, may be more fair as representations (Bauer & Baltes, 2002).

5. ***Writing both positive and negative comments on each individual*** is beneficial because it individuates the ratee and reduces the use of stereotypes (Bauer & Baltes, 2002).

6. ***Have evaluators justify opinions.*** Increased accountability increases the accuracy in evaluations (Lerner & Tetlock, 1999).

7. ***Avoid single general items as key measures of student ratings.*** Use student evaluations in conjunction with peer evaluations of teaching and course materials (Aleamoni, 1999).

8. ***Have good intentions:*** when people adopt accuracy goals, intending to evaluate others as unique individuals, bias is reduced (Blair & Banaji, 1996; Wheeler & Fiske, 1991).

9. ***Develop college and departmental norms*** for annual performance and P&T reviews that emphasize fairness and accuracy (Fiske, 2002).

10. ***Have diverse review committees to improve accuracy*** (Kanter, 1977; Valian, 1998; Onorato & Turner, 2004).

11. ***Support your colleagues:*** research shows that visible support from senior and respected colleagues can reduce impact of negative stereotypes and result in more fair evaluations (Brown & Geis, 1984).

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Figure 5: Bias minimizing resource shared with search committees.

After 5 to 7 criteria were established, each member of the Search Committee would review the applications independently before committee deliberations would take place. Search committee members would evaluate each candidate by rating each candidate as a high (3), medium (2), low (1) across each of the criteria identified and qualitatively describe and justify the ratings during the deliberations. Each member of the Search Committee needed to also come to the deliberations with their top 10 candidates (whether or not quantitatively the evaluation reveals that). A template was included to help with this step. All members would share their evaluations with the Search Committee Chair who would compile all the ratings in preparation for the next step – deliberations.

Upon each Search Committee Member completing her/his individual reviews and getting the reviews compiled by the Search Committee Chair, the team would meet to decide on the "short list." Along with the compiled ratings, each Search Committee Member would identify the top 5 candidates thinking holistically across the criteria. During these deliberations, candidates that multiple Search Committee Members endorsed to move to the next phase should be discussed to ensure the Search Committee wants to include them on the "Short List." For the applications/candidates that only one Search Committee Member endorsed, discussion would take place to determine if the candidate would get added to the "Short List." If there was endorsement from at least two Search Committee Members, then the candidate would move forward to the next phase and make the "Short List." The Search Committee Chair would then summarize the "Short List" and pass it on (along with the evaluation matrix) to the Founding Engineering Department Chair with accompanying thoughts, reflections, observations of the applicant pool and what the Search Committee would like to share. This short summary would be documented to reflect the high-level discussion of the applicant pool and summarize the committee's recommendations. This summary would also include where there was agreement and where members of the committee disagreed. For the applications/candidates that were not endorsed by any member of the Search Committee, deliberations did not need to take place and these applications could be "triaged" or "not discussed further."

Step 5. Conducting Video Interviews

The next step in the process was virtual interviews with the candidates. This step would help the team determine candidates to invite for on-site interviews. The Search Committee Chair would work with all members of the search committee to establish the standard set of virtual interview questions in alignment with the position ad and program needs. Sample questions from past faculty searches are below (**Table 4**). The key was consistency in process.

The Search Committee Chair would develop a standard invitation for the virtual interview. Consistency would be essential so that all candidates were treated the same. The virtual interview would need to be time boxed and the search committee would determine if the questions would be shared with each candidate before the virtual interview or just-in-time. Consistency in the interview process was the key for all candidates. As an example, each candidate was given the same instructions for the interview, the same amount of time, the same initial questions (follow-up questions may be different), etc.

Table 4: Sample video interview questions for faculty at Wake Forest Engineering.

Sample Video Interview Questions for Faculty (from past searches)
What aspects of building the new engineering department at WFU excite you the most and why?
Imagine speaking to a prospective student and her/his parents. How would you describe the WFU Engineering Program and the value of a BS Engineering degree?
Imagine teaching in WFU's new Department of Engineering. What might be one course you offer to teach that meets the following goals? [Goal 1: prepares students to learn engineering fundamentals, Goal 2: integrates content that might traditionally be taught separately, Goal 3: authentically reflects a valuing of the Liberal Arts]
Imagine doing scholarship in WFU's new Department of Engineering. Describe one project you would offer to engage undergraduate engineering students and how you would structure the experience?
Imagine supporting capstone projects in WFU's new Department of Engineering. Describe one capstone project you would offer to engage undergraduate engineering students and how you would structure the experience?
(OPTIONAL) Is there anything else you would like to share with us? (e.g., your response to a question that you wish we had asked, your proudest moment as an educator, feedback on this video interview process).

Each member of the search committee would review the applications independently before committee deliberations took place. Search committee members would review virtual interviews holistically by also considering the original review criteria and all application materials. Reflecting on the evaluation criteria, the interview questions, and your overall observations of the candidate's complete application, address the following:

STRENGTHS - What value would this person add to our department? What strengths does this candidate bring to the department?

STUDENT ENGAGEMENT - How do you see students engaging with this candidate?

CONCERNS – What concerns do you have about this candidate?

OTHER - Any other thoughts, comments, observations, perspectives?

RATING – (3) Yes! Bring this person in! (2) Sure, a worthy candidate but not a top choice. (1) No. Do not bring this person in.

Each Search Committee Member would evaluate the "Short List" holistically and come to the deliberations with their list of top 3 or 4 candidates that they would recommend to move forward to the "On Site Interview" phase.

Upon each Search Committee Member completing her/his individual reviews of the virtual interviews and getting the reviews compiled by the Search Committee Chair, the team would meet to decide on the list of 2-4 candidates to invite on site. Typically, we had approval to bring 3 candidates per position we were trying to fill. Each Search Committee Member would identify

the top 3-4 candidates holistically reflecting across all criteria. During these deliberations, candidates that multiple Search Committee Members endorsed would be discussed holistically and be considered for the "Invite on Site List". For the applications/candidates that only one Search Committee Member endorsed, discussion would take place to determine if the candidate should get added to the "Invite on Site List." If there is endorsement from at least two Search Committee Members, then the candidate would move forward to the next phase and make the "Invite on Site List." The Search Committee Chair would then summarize the "Invite on Site List" and pass it on (along with the evaluation matrix) to the Founding Engineering Chair with any accompanying thoughts, reflections, observations of the applicant pool and what the Search Committee would like to share. This short summary would be documented to reflect the high-level discussion of the applicant pool and summarize the committee's recommendations. This summary would include where there was agreement and where members of the committee disagreed. For the applications/candidates that were not endorsed by any member of the Search Committee, deliberations did not need to take place and these applications could be "triaged."

Step 6. On Site Interviews

The next step was to invite candidates on site. For consistency across the searches, the WFU Engineering Administrative Assistant in coordination with the Founding Engineering Chair would arrange and manage the logistics for the On Site Interviews. The Chair would send the email invitation and follow-up with a phone conversation. The Engineering Administrative Assistant would work with each candidate to setup travel logistics and finalize on-site interview schedules. One of the WFU Engineering faculty would be invited to serve as host and this often was intentionally identified to be someone outside of the search committee as a means to minimize confirmation bias with search committee members who are naturally forming strong opinions (in favor or against) specific candidates. A typical on-site interview schedule included meetings with the Department Chair (at the start of the interview and as an exit meeting), Provost's Office, Dean's Office, engineering faculty and staff (group or 1:1), engineering students, and faculty across campus that the candidate identified as collaborators of interest. The candidate would be asked to prepare both a teaching talk and a research talk. Details of all these details are showcased in **Figure 6**.

After the on-site interview, departmental feedback (**Figure 7**) would be solicited from faculty, staff, and students who engaged with each candidate. Student feedback was very important in the hiring process and served to provide valuable insights from our students. Feedback from departmental colleagues who engaged with candidates during the on-site interview process would also be solicited and served to provide valuable insights from our colleagues within and beyond the department. The administrative assistant would administer the survey.

Evaluation results were shared with faculty and staff in the department followed by group deliberations. The acceptability of each candidate would be solicited via a survey and the results of the survey would go to the Founding Engineering Chair, who had also been soliciting feedback from the College Dean's Office and the Provost's Office. If more discussion was needed at the department level, that would be done as a means for all perspectives and voices to be heard before the Chair worked with the Dean's Office to extend offers.

Description of On-site Visit

Day one will involve: (a) *meetings* with members of the Department of Engineering and the Chair of Engineering, an Associate Dean from the Office of the Dean, (b) a *tour* of our facilities and campus, (c) a *teaching demonstration session* with students and followed by a *teaching philosophy session* with members of the department.

Day two will involve: (a) a *curricular brainstorming session* with the engineering faculty, (b) additional meetings with members of the Department of Engineering and/or search committee, (c) open times for you to speak with potential collaborators of your choosing from across campus, and (d) a closing meeting with the Engineering Chair. We would be happy to coordinate meetings with any interested parties you might be interested in connecting with and can help identify individuals if you can offer who you would like to meet with. *If you are interested in meeting with others at WFU,* ***please share specific individuals or describe who you would like to meet with*** *and we will help to identify the appropriate individuals.*

Here are some more details that describe expectations for the Teaching Demonstration, the Scholarship/Research Seminar, and the Curricular Team Brainstorming Session.

Teaching Demonstration & Student Project Showcase (Day 1)

[30 mins for the teaching demo, 30 mins Q&A with students, 15 mins for the teaching philosophy, 15 mins of Q&A with members of the engineering team]

With an audience of mostly WFU engineering students and members of the Department of Engineering, you are asked to imagine a first year “module” in the new Wake Forest engineering curriculum and present this "module" using a pedagogical approach of your choice. The second part of this session will be a presentation showcasing your teaching philosophy in educating the next generation of engineers (including the opportunities that exist with capstone design). Please also speak to projects that you envision working on with WFU students (engineering and non-engineering). ***We ask that you provide a title, a one paragraph abstract (no more than 250 words), and a relevant visual (optional) on the "module" to be used to invite students.***

Scholarship/Research Seminar (Day 1) - [40 min talk and 20 min Q&A]

With an audience of faculty, staff, researchers, and students from across campus, you are asked to share a summary of your scholarly and research activities with appropriate detailed examples, as well as describe your plan for scholarship and research at Wake Forest. The role that students and/or collaborators would play in this plan should be described. ***We ask that you provide a title, a short abstract, and a relevant visual (optional).***

Curricular Team Brainstorming Session (Day 2) - [1 hour total – no prep necessary]

In simulating much of what we have done to date, this session is designed to engage you in a team brainstorming activity around a curricular design challenge. There is no preparation needed for this session and we will be sharing some context closer to your visit date.

Figure 6: Script provided to candidates in preparation for the on-site visit at Wake Forest Engineering.

Feedback Survey - EGR Faculty Candidate 2020

Thank you for joining us during the 2-day virtual faculty interview with XXXX Assistant Professor Candidate. Your responses are anonymous, unless you would like to provide your name.

Q1 During which activity(s) did you interact with the candidate? (check all that apply)

One-on-One or Small Group Meeting / Teaching Philosophy and Teaching Vision Talk / Research/Scholarship Talk / Other _____

Q3 What describes your role at Wake Forest?

Engineering Faculty / Engineering Staff / Faculty outside of the Department / Staff outside of the Department

Q4 What do you think are the candidate's greatest strengths and value for our Department of Engineering and our Wake Forest University community?

_____

Q5 What concerns do you have about this candidate's fit with the Engineering Department or Wake Forest University?

_____

Q6 Reflecting on your interactions with the candidate, please provide thoughts and feedback on your observations about the candidate with respect to any or all of our criteria. Examples of how candidate did/did not reflect the criterion

- Embraces a liberal education including engagement with diverse partners
- Adds to scholarly diversity of faculty and will develop students via scholarship and projects
- Potential to teach across the curriculum and innovate in the classroom
- Excitement about extra responsibility and opportunity of being founding team member
- Supports an inclusive work environment (teaching, scholarship, service) and seeks diversity

Q7 How strongly do you agree with the following statements?
Strongly Agree / Agree / Neutral / Disagree / Strongly Disagree / No Basis to Evaluate

- This candidate shows potential to engage with diverse partners.
- This candidate embodies the Engaged Teacher Scholar ideals of WFU.
- This candidate has the potential to engage students in a variety of engineering courses.
- This candidate has the potential to develop innovative learning experiences.
- This candidate adds scholarly or disciplinary diversity to the existing engineering faculty.
- I can see students seeking out this candidate for projects.
- This candidate would support an inclusive work environment for colleagues and students.
- This candidate embraces the challenges and opportunities joining the founding team.
- I see value in this candidate joining WFU Engineering.

Q8 Do you have any additional comments that would be helpful to share?

_____

Q9 Do you find this candidate acceptable? Yes / No / Not sure

Q10 Would you support for this candidate to join our team? Yes / No / Not sure

Q11 OPTIONAL - Your name

Q12 THANK YOU so much for making time to meet with this candidate and for sharing feedback with us. Your time and insights are very valuable to us. Have a wonderful day.

Figure 7: Faculty candidate evaluation form shared post on-site visit with faculty, staff, students, and all those who met with the candidate.

VI. BUILDING ALIGNMENT

The exit interview that was at the end of the on-site interview was a critical point for the Founding Engineering Chair (Pierrakos) to answer any questions that candidate had, describe the state of the department, remind the candidate about the established values, vision, and mission of the department (that were already part of the position description), describe the culture and workings of the department, discuss current and ongoing departmental initiatives, emphasize the commitment to student-centered pedagogies in the curriculum as well as departmental initiatives, and to offer documentation on performance evaluation, promotion procedures, etc. Documents like the following (**Tables 5 and 6**) shown would demonstrate to candidates what was valued and also what was expected. Such documents may not be the typical thing to share with candidates during interviews but for Pierrakos it served as an opportunity to communicate vision, culture, expectations, and norms. It is important for candidates to make informed decisions about "fit" and for Pierrakos it was an opportunity to show transparently who we are. For ***teaching***, we valued (1) student engagement in the classroom, (2) student mentoring (beyond required coursework), (3) student feedback on teaching and being responsive to the feedback, (4) instructional effort, (5) academic advising, (6) collaborative teaching, (7) course design, (8) curriculum development, (9) continuous improvement, and (10) awards & recognitions. For ***service***, we valued (1) supporting peers & bettering department culture, (2) supporting annual departmental goals, (3) departmental accreditation, (4) university service, (5) service to the profession, (6) community & society betterment (outreach), (7) continuous improvement, and (8) awards & recognitions. For ***research***, we valued (1) publications, (2) grants proposal submissions, (3) sponsored awards, (4) invited presentations, (5) continuous improvement, (6) collaborations and partnerships, (7) diversity of scholarship (e.g. discovery, application, integration, teaching and learning), (8) scholarly supervision, (9) supporting the scholarship of others, (10) consulting, and (11) awards and recognitions.

Onboarding sessions with new hires took place in the first few weeks on site and continued to lay out important documentation to support alignment with the curriculum, advising, research and scholarship, pedagogy, accreditation, budget, resources, mentoring, equipment, etc. Operational documents were shared with the new hires on matters of budget, curriculum, accreditation, pedagogy, research, service, etc.

Faculty mentoring continued post onboarding and involved one-on-one meetings as well encouraging Wake Forest Engineering faculty to find mentors outside of the department and external to Wake Forest University also. If I could play a role in helping formalize any mentoring, I was happy to support mentor/mentee matching.

Table 5: Teaching & Advising Evaluation: positive impact on students' learning and growth via teaching, course and curriculum development, and professional growth. The rubric items are not listed in any particular order.

Theme	EXCEPTIONAL	OUTSTANDING	MERITORIOUS	SATISFACTORY	UNSATISFACTORY
Student Engagement in the Classroom	☐ The instructor actively engages most (if not all) students in learning, provides relevance and motivation for learning, builds interpersonal connections with students, challenges students to learn deeper, is approachable, etc. and demonstrates this engagement using method-driven assessment processes and data.	☐ The instructor actively engages most students in learning, provides relevance and motivation for learning, builds interpersonal connections with students, challenges students to learn deeper, is approachable, etc. and demonstrates this engagement using assessment data.	☐ The instructor actively engages most students in learning, provides relevance and motivation for learning, builds interpersonal connections with students, challenges students to learn deeper, is approachable, etc.	☐ The instructor engages students in learning, provides relevance and motivation for learning, builds interpersonal connections with students, challenges students to learn deeper, is approachable, etc.	☐ The instructor does not engage with students in learning, nor motivating students to learn, nor to build interpersonal connections with students, and is not approachable.
Student Mentoring (beyond required coursework)	☐ The instructor actively engages many students in personal and professional growth as evidenced by independent projects/theses, undergraduate research, community projects, advising student organizations, opportunity applications, etc.	☐ The instructor actively engages several students in personal and professional growth as evidenced by independent projects/theses, undergraduate research, community projects, student organizations, opportunity applications, etc.	☐ The instructor actively engages a couple of students in personal and professional growth as evidenced by independent projects/theses, undergraduate research, community projects, opportunity applications, etc.	☐ The instructor engages students in independent projects/theses, undergraduate research, community projects, etc.	☐ The instructor does not engage students in independent projects/theses, undergraduate research, community projects, etc.
Student Feedback on Teaching	☐ Consistently high course evaluations and positive student feedback across a diverse set of courses in the curriculum.	☐ Above average course evaluations and mostly positive student feedback across courses in the curriculum.	☐ Average course evaluations and somewhat positive student feedback across courses in the curriculum.	☐ Around average course evaluations and student feedback across courses in the curriculum.	☐ Consistently below average evaluations and considerable not-positive student feedback across courses in the curriculum.
Instructional Effort	☐ Leads development of new course or actively and frequently improves course content, pedagogy, instruction and student learning through deep reflective practice and method-driven assessment processes and data.	☐ Co-leads development of new course or actively and frequently improves course content, pedagogy, instruction and student learning through deep reflective practice and assessment data.	☐ Actively and frequently improving course content, pedagogy, instruction and student learning through deep reflective practice.	☐ Improving course content, pedagogy, instruction and student learning through deep reflective practice.	☐ No evidence of improving course content, pedagogy, instruction and student learning through deep reflective practice.
Academic Advising	☐ Supporting students to seek out and apply university, regional, or national recognitions or awards.	☐ Meeting with student advisees every semester to reflect, develop, and evaluate achievement of action items (e.g. IDP) and keeping records of the advising sessions.	☐ Communicating or meeting with many students for academic advising and keeping records of the advising sessions.	☐ Communicating or meeting with some students for academic advising.	☐ No student academic advising at any level.

Collaborative Teaching	☐ Collaborative teaching evidenced by integrating content/subject areas, explicitly soliciting and integrating content/subject topics from other disciplines/fields, and full co-teaching with other faculty and/or teaching partners	☐ Collaborative teaching evidenced by integrating content/subject areas, explicitly soliciting and integrating content/subject topics from other disciplines/fields, and partial co-teaching with other faculty and/or teaching partners.	☐ Collaborative teaching evidenced by integrating content/subject areas and explicitly soliciting and integrating content/subject topics from other disciplines/fields.	☐ Collaborative teaching evidenced by integrating content/subject areas traditionally taught in separate courses.	☐ No evidence of collaborative teaching.
Course Design	☐ All elements of exceptional course design (syllabi, assignments, instructional materials, course projects, learning assessments) purposely designed to achieve the learning outcomes desired.	☐ Most elements of exceptional course design (syllabi, assignments, instructional materials, course projects, learning assessments) purposely designed to achieve the learning outcomes desired.	☐ Many elements of exceptional course design (syllabi, assignments, instructional materials, course projects, learning assessments) purposely designed to achieve the learning outcomes desired.	☐ Some elements of exceptional course design (syllabi, assignments, instructional materials, course projects, learning assessments) purposely designed to achieve the learning outcomes desired.	☐ Limited elements of exceptional course design (syllabi, assignments, instructional materials, course projects, learning assessments) purposely designed to achieve the learning outcomes desired.
Curriculum Development	☐ Actively supporting programmatic curriculum development, exploring the national and international landscape for us to be leaders in engineering education using evidence-based practices/methods, and developing plans to identify resources to implement.	☐ Actively supporting programmatic curriculum development and exploring the national and international landscape for us to be leaders in engineering education.	☐ Actively supporting programmatic curriculum development by attending and participating in meetings and department efforts.	☐ Involved in aspects of programmatic curriculum development efforts by attending departmental meetings.	☐ Not involved in programmatic curriculum development efforts.
Continuous Improvement	☐ Continued and frequent advancement as well as sharing of own knowledge and growth around teaching methods, pedagogies, assessment of student learning, etc. with evidence of positive impact on students' learning and our curriculum.	☐ Continued and frequent advancement as well as sharing of own knowledge and growth around teaching methods, pedagogies, assessment of student learning, etc.	☐ Continued advancement of own knowledge and growth around teaching methods, pedagogies, assessment of student learning, etc.	☐ Some or limited advancement of own knowledge and growth around teaching methods, pedagogies, assessment of student learning, etc.	☐ No advancement of own knowledge and growth around teaching methods, pedagogies, assessment of student learning, etc.
Awards & Recognitions	☐ Receipt of teaching-related university or national award or recognition reflecting externally judged evaluation.	☐ Receipt of teaching-related college award or recognition.	☐ Receipt of teaching-related departmental award or recognition granted by students and/or peers.	☐ A recognition by the department of taking part in the teaching and/or student learning mission.	☐ Not applicable.

Table 6: Service Evaluation: betterment of communities at diverse levels. The rubric items are not listed in any particular order.

Theme	EXCEPTIONAL	OUTSTANDING	MERITORIOUS	SATISFACTORY	UNSATISFACTORY
Supporting Peers & Bettering Department Culture	☐ Evidence of exceptional contributions in support of peers' leadership in service activities. Demonstrating a positive and productive attitude and going above and beyond to support peers and better the culture of our department. Being inclusive and equitable in the efforts involving peers within and beyond our department.	☐ Evidence of exemplary contributions in support of peers' leadership in service activities. Demonstrating a positive and productive attitude and taking above average action in supporting peers and bettering our department. Being inclusive and equitable in the efforts involving peers within and beyond our department.	☐ Evidence of contributions in support of peers and building collegiality in the department. Demonstrating a positive and productive attitude in supporting peers. Being inclusive and equitable in the efforts involving peers. Support the efforts of peers and bettering our department.	☐ Contributing to supporting peers and building a collegial departmental culture. Demonstrating a positive and productive attitude in supporting peers. Being inclusive and equitable in the efforts involving peers.	☐ Not contributing to the success of peers and our department. Not being positive and having a productive attitude towards peers. Not being inclusive and equitable towards peers.
Supporting Annual Departmental Goals	☐ Demonstrate lead or coordination role of a major committee or effort that aligns with departmental goals. Effectively document the work. Assess and evaluate the extent to which the goal(s) were met, as well as solicit feedback for continuous improvement. Disseminate and share the findings and/or recommendations with relevant constituents.	☐ Demonstrate lead or coordination role of a major committee or effort that aligns with departmental goals. Effectively document the work. Assess and evaluate the extent to which goals were met. Disseminate and share the findings and/or recommendations.	☐ Demonstrate coordination role of a minor committee or effort that aligns with departmental goals. Effectively document the work. Assess and evaluate the extent to which goals were met. Disseminate and share the findings and/or recommendations.	☐ Actively engage and support all assigned departmental efforts or committees. Commit to positively benefiting the work through participation, action, sharing, and dissemination. Provide constructive feedback to benefit the progress of the effort(s). Reflect the values of our department.	☐ Not engaged with departmental service to bettering our community.
Departmental Accreditation	☐ Demonstrate lead role towards our departmental accreditation efforts. Effectively document the work. Assess and evaluate the extent to which goals were met, as well as solicit feedback for continuous improvement. Disseminate and share the findings and/or recommendations with relevant constituents.	☐ Demonstrate coordination of a major subset of the accreditation efforts. Effectively document the work of the effort. Assess and evaluate the extent to which goals were met. Disseminate and share the findings and/or recommendations.	☐ Demonstrate coordination of a minor subset of the accreditation efforts. Effectively document the work of the effort. Assess and evaluate the extent to which goals were met. Disseminate and share the findings and/or recommendations.	☐ Actively engage and support departmental accreditation efforts. Commit to positively benefiting the work through participation, action, sharing, and dissemination. Provide constructive feedback to benefit the progress of the effort(s). Reflect the values of our department.	☐ Not engaged with departmental accreditation efforts.
University	☐ Demonstrate lead or coordination role of a major university committee or effort. Effectively document the work of the committee or effort. Assess and evaluate the extent to which goals were met, as well as solicit feedback for continuous improvement. Disseminate and share the findings and/or	☐ Demonstrate a formal role on a major university committee or effort. Effectively support documenting the work of the committee or effort. Support the assessment and evaluation in measuring the extent to which goals were met. Support the dissemination and sharing of the findings and/or recommendations.	☐ Demonstrate a formal role on a minor university committee or effort. Effectively support documenting the work of the committee or effort. Support the assessment and evaluation in measuring the extent to which goals were met. Support the dissemination and sharing of the findings and/or recommendations.	☐ Actively engage and support university efforts or committees. Commit to positively benefiting the work through participation, action, sharing, and dissemination. Provide constructive feedback to benefit the progress of the effort(s).	☐ Not engaged with university service to bettering our community.

	recommendations with relevant constituents.				
Profession	☐ Demonstrate lead or coordination role of a major national/international committee or effort. Effectively document the work of the committee or effort. Assess and evaluate the extent to which goals were met, as well as solicit feedback for continuous improvement. Disseminate and share the findings and/or recommendations with relevant constituents.	☐ Demonstrate a formal role on a major national/international committee or effort. Effectively support documenting the work of the committee or effort. Support the assessment and evaluation in measuring the extent to which goals were met. Support the dissemination and sharing of the findings and/or recommendations.	☐ Demonstrate a formal role on a minor national/international committee or effort. Effectively support documenting the work of the committee or effort. Support the assessment and evaluation in measuring the extent to which goals were met. Support the dissemination and sharing of the findings and/or recommendations.	☐ Actively engage and support national/international professional efforts or committees. Commit to positively benefiting the work through participation, action, sharing, and dissemination. Provide constructive feedback to benefit the progress of the effort(s).	☐ Not engaged with service to one's profession(s) and bettering professional community(ies).
Community & Society (Outreach)	☐ Demonstrate lead or coordination role of a major community/societal committee or effort. Effectively document the work of the committee or effort. Assess and evaluate the extent to which goals were met, as well as solicit feedback for continuous improvement. Disseminate and share the findings and/or recommendations with relevant constituents.	☐ Demonstrate a formal role on a major community/societal committee or effort. Effectively support documenting the work of the committee or effort. Support the assessment and evaluation in measuring the extent to which goals were met. Support the dissemination and sharing of the findings and/or recommendations.	☐ Demonstrate a formal role on a minor community/societal committee or effort. Effectively support documenting the work of the committee or effort. Support the assessment and evaluation in measuring the extent to which goals were met. Support the dissemination and sharing of the findings and/or recommendations.	☐ Actively engage and support community/societal efforts or committees. Commit to positively benefiting the work through participation, action, sharing, and dissemination. Provide constructive feedback to benefit the progress of the effort(s).	☐ Not engaged with service to one's community/society and bettering the community/society.
Continuous Improvement	☐ Continuously seeking new knowledge and skills in advancing self and one's communities. Sharing knowledge with department. Soliciting feedback to continuously improve oneself and department. Leading positive impact towards self, peers, and the department.	☐ Continuously seeking new knowledge and skills in advancing self and one's communities. Soliciting feedback to continuously improve oneself and department. Leading positive impact towards self, peers, and the department.	☐ Continuously seeking new knowledge and skills in advancing self and one's communities. Soliciting feedback to continuously improve oneself and department.	☐ Continuously seeking new knowledge and skills in advancing self. Soliciting feedback to continuously improve oneself.	☐ No advancement or continuous improvement of self or department.
Awards & Recognitions	☐ Receipt of service-related university or national award or recognition reflecting externally judged evaluation.	☐ Receipt of service-related college award or regional recognition.	☐ Receipt of service-related departmental award.	☐ A recognition by the department of contributing positively to the department.	☐ Not applicable.

VII. WAKE FOREST ENGINEERING TEAM

In this section, successful diversity outcomes of broadening participation are showcased to demonstrate the impact of ethical and inclusive hiring practices described previously. As Founding Chair of Wake Forest Engineering, following the process and procedures outlined herein, Pierrakos oversaw the hiring of the following (**Table 3**) permanent faculty team from 2017 to 2022 (excluding the founding faculty team that Pierrakos did not oversee as a hiring process but contributed to as a committee member):

Table 7: Diversity characteristics of the permanent Wake Forest Engineering faculty hired using the steps, practices, and processes described in the previous section.

Hiring Year	Gender	Discipline (PhD)	Race/Ethnicity	Rank
2018	Female	Environmental Engineering	African American	Assistant (TT)
2018	Male	Computer Engineering	Caucasian	Assistant (TT)
2018	Female	Biomedical Engineering	Caucasian	Assistant (TT)
2019	Female	Environmental Engineering	African American	Assistant (TT)
2019	Female	Civil Engineering	Caucasian	Assistant (TT)
2019	Female	Biomedical Engineering	Caucasian	Assistant (Teaching)
2019	Male	Biomedical Engineering	Middle Eastern	Associate (Tenured)
2020	Male	Biomedical Engineering	Caucasian	Assistant (Teaching)
2021	Female	Civil Engineering	Caucasian	Associate (Tenured)

Table 7 shows that the hiring process outlined previously supported the hiring of 67% female faculty and 33% of faculty bringing racial/ethnic diversity to the team. Disciplinary engineering diversity is also evident amongst the team representing diverse engineering disciplines. Because the allocated permanent faculty lines could not keep up with enrollment and curricular demands of the program (i.e. during the initial fall 2021 ABET visit, nearly 50% of the curriculum was taught by temporary faculty), Pierrakos also oversaw the hiring of over 15 non-permanent hires – (1) visiting assistant professors (full-time) and (2) adjunct (part-time) professors. To diversify the permanent Wake Forest Engineering team, most of which (but not all) had academic research journeys and not professional engineering practice journeys, Pierrakos and team worked to hire more diversity with the non-permanent hires. Practicing engineers and research engineers were hired as full-time visiting faculty across structural engineering, mechanical engineering, electrical engineering, tissue engineering, etc. Ultimately, over 12 engineering disciplines were represented in the Wake Forest Engineering faculty body. Because the unique vision of Wake Forest Engineering has been to Educate the Whole Engineer (Pierrakos, 2024), I also brought in external funding and secured soft funding to hire full-time social scientists, educational researchers, and ethicists to be part of the Wake Forest Engineering team. This is because of our intentionality to integrate technical engineering knowledge and personal/professional knowledge and skills within every engineering course (Pierrakos, 2024).

Although staff hiring (i.e. lab managers, administrative support, advising support) followed some similar hiring practices, this paper focuses on faculty hiring of Wake Forest Engineering and excludes staff hiring details.

All in all, Pierrakos leveraged research-grounded, evidence-based, and bias-mitigating hiring strategies to hire over 30 faculty and staff (permanent and non-permanent, full-time and part-time) to launch and build Wake Forest Engineering from 2017 to 2022. The team diversity transcended engineering discipline, disciplines beyond engineering, gender, race, ethnicity, professional journeys within and beyond academia, etc. Having a diverse faculty and staff team would serve as a foundational feature to innovate across the curriculum, to recruit and retain a diverse student body, to innovate in terms of research, to make positive impact across the community (Pierrakos, 2024). As a result of building a diverse faculty and staff team, the following were also positively influenced and impacted:

1. While Wake Forest University Admissions expected (from admissions and degree interest data) 15% female students in the incoming classes, the reality became that 40%+ of students enrolling in engineering classes were women. These female students had not experienced an engineering classroom environment yet, but they saw themselves represented in the engineering faculty body that was majority women and saw the Founding Engineering leader being a woman. We started to witness year after year, higher percentages of women enrolling in engineering compared to admission predictions and admission degree-interest selections. Female students interested in engineering were willing to give engineering a try because they saw women represented in the Wake Forest Engineering department. They knew they would not be alone in the journey. These trends of recruiting 40%+ female engineering students year after year continued and still remain. Currently, 50% of the Wake Forest Engineering faculty are women and this level of representation will continue to signal to prospective students that women can be successful engineers. While female representation in the Wake Forest Engineering faculty body plays a critical role with recruiting a diverse student body, the retention of these female engineering students was achieved by curricular, pedagogical, and advising innovation described in previous and forthcoming publications (Pierrakos, 2024; Pierrakos, 2025).

2. Beyond gender, Wake Forest University started to recruit and retain one of the most diverse student bodies on the predominantly white campus. Because of the diversity visible within the Wake Forest Engineering faculty body (i.e. gender, race, ethnicity, engineering disciplinary diversity), engineering student demographics also reflected immense diversity including racial diversity (20%+), ethnic diversity (15%+), first generation student diversity (10%+), student athletes, and diverse students interests across many engineering applications and engineering disciplines, etc. The degree of diversity in the student body surpassed many established departments on the campus and certainly surpassed national engineering norms. ***A diverse faculty body has tremendous impact even in recruiting a diverse student body.***

3. Diversity drives excellence and this also became evident with other successes of Wake Forest Engineering. Curricular, pedagogical, and advising innovation described in previous and forthcoming publications (Pierrakos, 2024; Pierrakos, 2025) is evidence of leveraging a diverse team to positively impact the learning experience of students. Colleagues beyond engineering were frequently invited to curricular discussions in

support of innovative and inclusive practices to support student development (Pierrakos, 2024; Pierrakos, 2025). ***Success in diversity creates momentum for further progress.***

4. The disciplinary diversity of the Wake Forest Engineering faculty body also led to Engineering becoming the 2nd highest performing department on campus in terms of external funding in 2022. Even without a graduate program, Wake Forest Engineering surpassed sponsored awards compared to PhD granting departments at Wake Forest University. The interdisciplinarity of the Wake Forest Engineering team enabled cross-knowledge and research collaborations within and beyond Engineering. Wake Forest Engineering faculty were collaborating with colleagues across campus and within the department. ***This is another example of the positive impacts of intentionality around diversity driving excellence***.

5. Because curricular and pedagogical innovation was entrenched in the founding and launch of Wake Forest Engineering, the engineering faculty started to be scholars of engineering education even though they did not come in with that expertise upon hiring. Because it was built into the reward structure and ethos of the department, I started to witness Wake Forest Engineering faculty publishing in their technical areas of engineering and also publishing in engineering education venues. As an engineering education researcher and technical engineer (biomedical and mechanical engineering), Pierrakos certainly modeled that for the Wake Forest Engineering faculty too.

6. ABET highlighted as program strengths Inclusive Excellence as an attribute to Wake Forest Engineering achieving unprecedented faculty diversity, student diversity, and curricular innovation. Accreditation came fall 2022 and upon being accredited, Wake Forest Engineering became the highest ranked academic program at Wake Forest University. In 2023, US News Report ranked Wake Forest Engineering as the 14th Best Undergraduate Engineering program among nearly 275 universities across the United States. Such successes are built on many strategic, inclusive, ethical, and innovative practices.

While there are other successes that evolved from building a diverse faculty body within Wake Forest Engineering, the above are just a few examples. Diversity truly drives excellence, but intentionality is needed and sustained effort is needed for momentum to continue delivering positive progress. While many of the strategies described herein continue to be engrained in the structures, culture, and fabric of Wake Forest Engineering, there are also many practices that have eroded since Pierrakos stepped down as Founding Chair of Wake Forest Engineering in December 2022. Many steps in the hiring procedures and practices have since eroded and intentionality around diversity in other areas has also eroded. This points to the need for academic leaders to be strategic and intentional about diversity, systemic bias reduction requiring multiple approaches, cultural change requiring structural change, sustained effort being essential, etc. Erosion of effective strategies points to the failure that many organizations face in regards to sustainability and a lack of leadership training in areas of bias, ethics, equity, and diversity.

VIII. DISCUSSION & CONCLUSIONS

The Wake Forest Engineering case described herein demonstrates that engineering education transformation through diverse faculty recruitment and mentoring is both possible and impactful. Success requires intentional strategies, sustained commitment, and systematic implementation. The strategies and practices presented herein offers a tested model for other institutions seeking similar transformation. **Table 7** serves to showcase some essential strategies (18 of them) used to build a diverse faculty team at Wake Forest Engineering. Many of these strategies are tested and have been shown to minimize bias, to be inclusive of historically excluded groups, to be the right thing to do (the ethical thing). The impact of these strategies enabled Wake Forest Engineering to deliver: (a) **Diverse and inclusive environment**: The program attracted a diverse student body, reflecting the diversity of the faculty and staff. (b) **Innovative curriculum**: The interdisciplinary approach fostered a rich learning experience for students. (c) **Enhanced student outcomes**: The program achieved high rankings and produced well-rounded graduates. (d) **Strong research productivity**: The diverse team contributed to significant research output.

The urgent need to transform engineering education can be met through strategic approaches to building diverse, inclusive faculty teams. This work not only benefits current students and faculty but helps create a more equitable and innovative future for engineering education. Building a diverse faculty team enables many more successes. This paper presented a compelling case study on the transformation of Wake Forest Engineering. The key strategies for building a diverse team included intentionality and strategy.

There are many implications for higher education from this paper. Diverse teams can lead to innovative solutions and improved outcomes. Research has already shown this across diverse organizations and industries. Higher education must take this as an opportunity to better serve the increasingly more diverse student body. There is also a need for intentionality. To build a diverse and effective team requires careful planning and execution. Many effective strategies exist and they have been tested. Higher education needs to start using these tested strategies to diversify the faculty body and with a diverse faculty body will come a thriving student body who will see themselves represented in the faculty. The value of interdisciplinary collaboration is also evident from this paper. Breaking down silos can lead to new insights and breakthroughs. This paper encourages other institutions to adopt tested and effective strategies to transform their engineering programs and transform higher education. By prioritizing diversity, innovation, inclusion, and ethics, we can create a brighter future for the next generation of students, academics, and higher education. Some key takeaways are summarized in **Figure 8**.

Diversity can drive excellence when properly supported with sustained effort. Such excellence creates momentum for further progress as has been shown in the Wake Forest Engineering story. Structural change can drive cultural change but intentionality and sustained efforts is needed. Bias reduction strategies do exist and should be leveraged with every aspect of engineering education.

Table 7: Ethical, inclusive, and bias-minimizing hiring strategies used by Pierrakos and team at Wake Forest Engineering to support the hiring of a diverse team from 2017 to 2022.

	Ethical and Inclusive Hiring Practices Used at Wake Forest Engineering
Job Ad & Recruitment Phase	1. **Develop Inclusive and Purposeful Position Descriptions** – rethink the traditional position description to include a unique vision and opportunity, to showcase the department culture and values, to focus on essential competencies, to invite a diversity of candidates and to demonstrate an authentic commitment to diversity and inclusion. 2. **Invite a Diversity of Disciplines and Experiences** – cast a wider net of candidates to apply for the positions is important messaging to invite a diverse set of candidates with a diversity of backgrounds, disciplines, and experiences. 3. **Broaden the Recruitment Channels to Reach More Diverse Candidates** – disseminate the position to multiple diverse recruiting channels and partner with organizations and networks that serve underrepresented groups. Proactive sourcing of diverse candidates is essential to having a diverse pool of candidates.
Screening Phase	4. **Form Diverse Search Committees** – ensure a range of perspectives in the evaluation process and form a diverse search committee (e.g. gender, race/ethnicity, rank, discipline) to minimize inherent biases. Invite committee members from other departments to minimize affinity and confirmation biases. 5. **Institute Search Committee Training (Bias, Confidentiality, and Conflicts of Interest)** – training is truly needed for hiring committees not once but with every search. It is imperative that search committees receive training on bias, confidentiality, and conflicts of interest. There is so much inherent bias in hiring processes that intentionality is needed to minimize biases and set higher ethical and inclusive standards. Awareness is step one and then comes bias mitigation strategies. 6. **Use Holistic and Standardized Screening and Selection Criteria** – define criteria prior to screening candidate applications and consider not only academic qualifications but also more holistic criteria around teaching and research philosophies. These criteria should recognize transferable skills and diverse experiences. Consider criteria that embrace the value add and new perspectives that candidates would bring to the team. Be sure that non-traditional paths and experiences are not dismissed. 7. **Use Structured and Consistent Processes** – establish clear guidelines and consistent procedures (e.g. set questions, times, formats, etc.) to minimize biases inherent in screening and selection processes.

Interview Phase	8. **Develop An Inclusive and Purposeful Interview Experience** – rethink the traditional on-site interview and develop an experience that invites candidates to choose meetings with potential future collaborators and enables candidates to demonstrate their knowledge, skills, and values. Invite a interview visit host outside of the search committee to minimize confirmation biases that are inherently forming with search committee members. 9. **Use Structured and Consistent Interview Processes** – establish clear structures, formats, and consistent procedures (e.g. set questions, times, required meetings, etc.) to minimize biases inherent in interview processes. Establish required minimum meetings with key personnel while also inviting more colleagues (beyond the search committee) to take part in the interview and provide insights into candidates. Encourage consistent types of questions to be used across candidates. 10. **Use Standardized Evaluation Criteria & Processes Post Interview** – establish a consistent process for post-interview feedback sourcing and invite all stakeholders (administrators, faculty, staff, students, colleagues from outside of the department) who engaged in the interview to provide feedback. Standardize the forms to solicit feedback with structured questions and consistent criteria as well as open-ended questions. 11. **Invite Feedback from Candidates for Continuous Improvement** – use anonymous and/or confidential formats to source feedback from candidates to improve the interview phase and experience. Negative experiences should not be ignored as they are an opportunity to improve and mitigate issues that will continue to hold back ethical and inclusive hiring practices.
Decision Making Phase	12. **Facilitate Structured Deliberations** – ensure that post-interview deliberations are structures and follow a consistent format and point to specific evidence rather than hearsay evidence. Structure processes minimize biases that are inherent with hiring. Emphasize complementary skills and perspectives that candidates would bring to the team. 13. **Use Data-driven Decision Making** – leverage the feedback from diverse stakeholders and make data-driven decision making the norm. Input from diverse stakeholders can be transparently shared with deliberation bodies.

Onboarding	14. **Customize Onboarding for New Hires** – personalize the onboarding experience to coach new hires to the department-specific and team-specific expectations, standards, norms, operating structures, available resources, etc. Set up new hires for success by showing them the cultures, structures, procedures, and expectations. Demonstrating the shared purpose of each team member towards collective goals and vision is also important. Allow space for one-on-one mentoring and guidance. 15. **Standardize Mentoring for New Hires** – establish standard mentoring plans and personalized mentoring plans. It is also important to establish regular check-ins and feedback sessions. Ensure special accommodation processes are clearly communicated. 16. **View Faculty Development as an Ongoing Process not Isolated to Onboarding Only** – establish a culture of faculty development and focus on developing the team as well as each faculty member. Identify resources (internal and external to the university) to support new hires at all stages of their career development.
Post Phase	17. **Track Diversity Metrics and Indicators** – formally or informally track dropout rates at each state of the hiring process (e.g. who is turning down offers and why? who is not getting offers and why?). Be proactive in identifying barriers to recruiting and hiring diverse talent. 18. **Establish a Culture of Continuous Improvement –** be proactive in observing patterns and trends that are hindering ethical, inclusive, and bias-minimizing hiring practices. This may require training for the team or search committees, establishing clearer and equitable criteria and standards, diversifying search committees, improving decision-making processes to include diverse stakeholder input, developing structures formats to interviews and feedback seeking steps, etc.

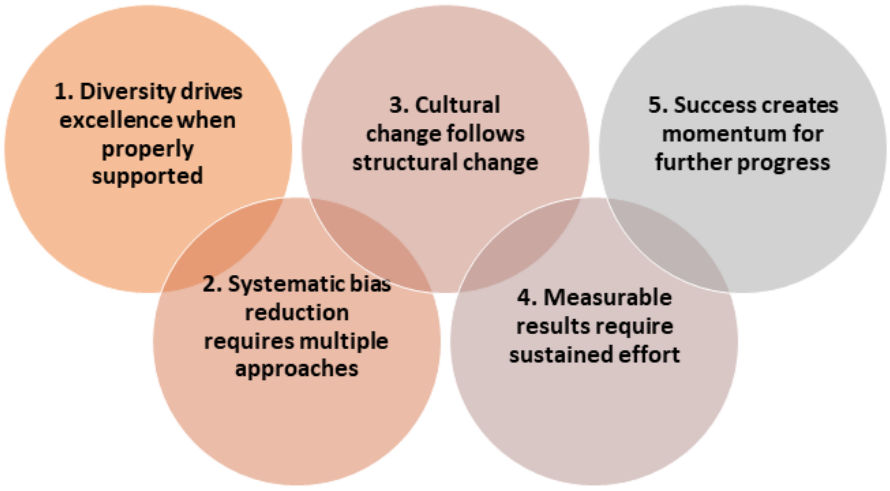

Figure 8: Key takeaways from this journey of building a diverse team at Wake Forest Engineering.

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