Case Study: Establishing a Sustainable Faculty Development Unit within a College of Engineering

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Case Study: Establishing a Sustainable Faculty Development Office within a College of Engineering

Abstract

The purpose of this paper is to present a case study for establishing a sustainable faculty development office in the College of Engineering at North Carolina State University. The office was strategically tailored to serve the distinct needs and requirements of engineering faculty in an increasingly complex and challenging global environment. The College of Engineering Faculty Development Office could function as a sustainable, national model for a range of engineering colleges within a variety of institution types.

The NC State College of Engineering Faculty Development Office was inaugurated in Spring 2008 with the express goal of connecting faculty in the college with professional and personal development opportunities. Its foundational mission was to recruit, promote, and retain excellent faculty across the college; actively engage faculty, administrators and staff across departments, and celebrate faculty success, achievement and promotion.

This case study introduces the history and establishment of a sustainable model with specific strategies for the potential to impact institutional change at a range of engineering colleges within a diverse set of academic institutions.

1. Introduction

The success and sustainability of faculty development programs in Science, Technology, Engineering, and Mathematics (STEM) and non-STEM environments are dependent on the commitment of the university to specific goals and initiatives. This commitment is demonstrated through the allocation of resources in the form of personnel and funding to execute new and expand existing initiatives. In many instances, there are faculty already working on issues that support faculty who are focused on professional and personal development of faculty. At a number of institutions, there are also offices of faculty development (or faculty affairs) at the level of the Provost or higher that are tasked with the overall university level development of faculty. The integration of a discipline-centric faculty development office into a college that represents a change in the traditional faculty development institutional framework requires strategic thinking.

2. Sustainable Faculty Development

Faculty development is not a new concept. Gillespie and Robertson (2010) indicate that the success of faculty development work depends on three main strategies: building a program, ensuring faculty ownership and creating a program that cultivates excellence and effectiveness"[1]. In a college environment, the creation of a grass roots movement to bring down discipline silos and promote the active engagement of faculty with each other requires more than a menu of disconnected programs. In order to ensure faculty ownership and engagement, programs need to be connected to a clear understanding of institutional priorities, particularly as it relates to

promotion and tenure decisions. In addition, programs must maintain high scholarly expectations of the field and account for the economic realities of being a faculty member.

2.1 Faculty Development Role

Faculty development is defined as "any endeavor designed to improve faculty performance in all aspects of their professional lives"[2] (p.1) as researchers, academic advisors, instructors, leaders, facilitators, mentors, and institutional decision makers. Faculty development is a dynamic process that seeks to change faculty members' "attitudes, skills, and behavior toward greater competence and effectiveness in meeting student needs, their own needs, and the needs of the institution"[3] (p. 7). Faculty development will remain an evolving process that continues to develop parallel to the demands placed upon faculty members, as their roles and responsibilities continue to expand, to reveal new approaches[2].

3. History and Catalyst

The Faculty Development Office in the College of Engineering (COE) at North Carolina State University (NC State) was established to advance faculty members' research and teaching resulting in scholarly work, professional development, and career advancements. The office now serves over 300 tenure- and non-tenure track faculty. In 2007, the primary engineering-centric initiative to enhance faculty development in the COE inside NC State was a new faculty orientation workshop for incoming faculty. This core workshop was successfully developed and implemented in 2000 by a group of two engineering teaching leaders, an education specialist, and the director of the campus center for teaching and learning[1]. The goal of the initiative was to equip new hires with tools to meet challenges of the critical early years of their professorial careers, with an associated reduction in the 4-5 year learning curve experienced by the majority of new faculty to the 1-2 years characteristic of "quick starters"[4]. The quick starters term was first introduced by Boice to include characteristics that new faculty expressed such as scheduling regular time for writing and producing enough manuscripts and publications that met or exceeded their institution's expectations, enthusiastically sharing their research with their students, incorporating their field of research in their classes, and delivering lectures at a pace that would give students the time and space to ask questions and engage in discussions. Additional areas of importance included limiting course preparation time after the first offering to less than 1.5 hours of preparation, allowing for more time to spend on writing, research, networking with other faculty members an average of 2-4 hours per week, developing connections that helped them with both academic instruction and field research, and easing their integration into the academic community[4].

The new faculty orientation workshop was generated by a collaborative effort of coalition members invested in engineering education reform. The workshop engaged engineering teaching leaders, administrators, department heads and senior faculty around topics that included effective teaching strategies, establishing and managing successful research programs; funding sources; managing time, and balancing professional and personal responsibilities. Administrative leadership and senior faculty provided insights on college/departmental cultures; getting off to a good start; and retention, promotion and tenure.

A successful decade of workshops dedicated to new faculty demonstrated inherent benefits that could be applicable to serve the needs of the broader community of faculty in the college. Recognizing the potential opportunity, a senior engineering professor initiated a comprehensive faculty development effort to extend workshop elements and provide professional advancement opportunities as a thread that could impact mid- and senior-level faculty over the life of a faculty member's career.

3.1 Office of Engineering Faculty Development

Why a faculty development office inside a COE? While there are myriad scholarly articles supporting the importance of engineering faculty development in the realm of teaching, there is a dearth of literature that addresses the need for a more comprehensive engineering-centric faculty development effort [2-6]. According to a National Science Board report (2012), [public research universities] "perform over half of all academic research and development, are contributors to state and local economies, and provide numerous public services"[6] (p. 6). The competition for outstanding research and teaching faculty (in both recruiting and retention) and the decline in state appropriations underscore the value of a COE Faculty Development Office. The office staffed by engineering leadership and personnel with experiential perspective provide the means to connect with the complex/unique roles, responsibilities, challenges and culture of engineering faculty. The COE Faculty Development Office was developed against the backdrop of a university-wide Office of Faculty Development also established in 2008 which focused primarily on broader faculty development issues.

3.2 Administrative Commitment to Permanent Faculty and Staff

As previously noted, success is dependent upon an administrative commitment to the allocation of resources in the form of personnel and funding. Establishing a sustainable faculty development effort requires a committed partnership between the dean, department heads and in this case the newly appointed associate dean. There is also a need for an investment of resources for both personnel and programs. Therefore, getting buy-in and insight from the dean of the college was a first step. An outcome of collaborative deliberation with the dean and wise counsel from college leaders (e.g., other associate deans and department heads) sought not just to expand the program, but to inaugurate a staffed faculty development office led by the senior engineering faculty member with an appointed position of Associate Dean of Faculty Development for the COE. The office would be dedicated to the professional welfare of all college of engineering faculty, establishing the college's commitment to developing and implementing innovative initiatives.

3.2.1 College of Engineering Associate Dean

The dean committed resources for a seasoned senior engineering faculty to fill the permanent position of Associate Dean of Faculty Development. In this case, the COE Associate Dean's perspective was informed by research knowledge and experiences at both the local and national levels enabling her to develop effective processes of connecting faculty to essential opportunities for targeted research growth and collaborations. The COE Associate Dean was also familiar with the unique challenges and opportunities in the faculty diversity realm. By

participating actively on national level programming in the NSF ADVANCE initiatives and identifying/training future diverse faculty, she was acutely attuned to the nuances of local college level diversity.

The COE Associate Dean now serves as a member of the college leadership team and has an opportunity to sit at multiple administrative tables in both the Provost and Chancellor's units. As an advocate for the faculty and a liaison to the provost's office, the Associate Dean is a resource in the development of faculty based polices at the Provost level and is responsible for the local dissemination of information to faculty at all ranks (i.e., tenure and non-tenure track) in the college. This occurs via targeted faculty communications and through interactions with college department heads.

3.2.2 Staff Positions

The Associate Dean leads a team that consists of an assistant director; event coordinator; media assistant and project based specialists (i.e. website developer, technical writers, etc.). The team strategically tailors and executes programs providing professional guidance for faculty college-wide; works collaboratively with upper-level administrators and cross-college teams on cutting-edge programs for leadership as well as faculty development; and interacts with department heads in recruiting, retention and promotion of a diverse set of faculty at all ranks. The structure and responsibilities of the team have evolved to meet the changing needs and expectations of the faculty relative to shifts in national funding opportunities.

4. Strategies for Creating a College of Engineering Faculty Development Office

Strategies for creating a faculty development office designated for engineering faculty consist of partnering with engineering leadership, building engineering-centric professional development programs, and both faculty participation and buy-in.

4.1 Partnership with College of Engineering Leadership

Strategically creating an effective program that cultivates engineering faculty excellence requires partnerships. Partnering with engineering leadership is essential because of the investments they have made in the faculty. In resource constrained environments, the continued quest for top-notch faculty makes every hire a critical investment in the future of the department and the college. The retention associated with these faculty investments is not a trivial issue in the short and long term economic planning of the institution. While most faculty hires may come directly out of the strategic plans of the departments and colleges, faculty satisfaction and their ability to be successful locally and globally is critical to protecting the college's human resource investment. The creation of an inspired community of faculty across the college requires strategic planning, thoughtful preparation and insightful mechanisms to connect faculty to their discipline and to each other. In this instance, the Faculty Development Office is a critical partner that exists at the intersection of the faculty, department heads, and university leadership.

For example, during college level executive committee meetings, the COE Associate Dean connects with department heads, engaging them as allies in the development of their

faculty. This collaborative partnership ensures an understanding that new initiatives fit into the fabric of each administrator's vision and departmental priorities. The Associate Dean regularly solicits input regarding the local culture of decision making regarding faculty issues (i.e., university level policies). The governing strategy is to solicit input into program design that encompasses the expectations of leadership and the needs of their faculty. This deliberate approach of engaging all major stakeholders (i.e., faculty of all ranks, department heads, administrators, staff), leads to the development of adaptable programs sensitive to local departmental cultures.

4.2 Building the College of Engineering Faculty Development Program

"The key to building a vital and effective program is to start small and grow carefully. It is best to start with one program and do it well and then the faculty demand for additional programming will naturally increase"[1] (p. 304). The new faculty orientation workshop served as the 'well-done program' with the addition of NSF CAREER proposal writing workshops and teaching issues clinics for early career engineering faculty.

The COE Associate Dean strategically laid the foundation for a professional development program relevant to the full complement of faculty at all ranks in the college. The first step was to convene an advisory faculty development roundtable of well-respected senior faculty representing each engineering department. The express goal of the roundtable was to establish a proper framework and balanced perspective of the departmental cultures, requirements and discipline specific expectations for faculty. The role of the representatives was to act in an advisory capacity and sounding board for the COE Associate Dean regarding faculty issues; provide relevant department/discipline specific feedback on programs and initiatives; and provide guidance on road-mapping the next phase of COE Faculty Development programming.

4.3 Faculty Participation

A core aspect of the COE Faculty Development programs is building credibility with faculty. This is accomplished by 1) providing relevant content; programming that addresses both professional and personal career elements; 2) emphasizing the visibility of administration's commitment to faculty success as evidenced by excerpts from workshop survey evaluations; 3) the opportunity to talk to and work with other new faculty and learn from senior faculty; 4) developing respect and trust through programs that demonstrate understanding of faculty expectations, and 5) building community by establishing a culture of faculty care, faculty-to-faculty peer relationships that cross departments for faculty who otherwise would not interact with other departments.

5. College of Engineering Faculty Development Programs that Serve All Faculty

A key component of COE Faculty Development Office is the creation of an inclusive culture. It serves all faculty including tenure track (TT) and non-tenure track (NTT) at all ranks. It is essential to create an environment where proactive coaching, mentoring and targeted partnerships for faculty enable them to connect across engineering disciplines. These opportunities are not limited to tenure track faculty and the increasing interdependence of both

groups (TT and NTT) in research and educational initiatives mandates implementing innovative initiatives; providing support for all Engineering faculty.

COE Faculty Development initiatives emphasize diversity, broadening participation, providing insights into locally relevant approaches that incorporate national trends in this arena. For example, the COE Associate Dean worked collaboratively with an engineering department head in the crafting and execution of a national NSF funded workshop to increase the success of underrepresented minorities in his field at the graduate and faculty level. The resulting report was widely disseminated nationally, promoting the college as an important change-agent in this realm.

While there is an emphasis on engineering relevant programs, table 1 illustrates more broadly how programs can be categorized to serve all faculty collectively or specific to rank and/or career stage.

Programs and Opportunities for	Areas of d Development	Tools for Development of	Facilitating Faculty Growth from "*Hire to Retire*" Through
• Early career/junior faculty • Mid-career faculty • Senior faculty • Non-tenure-track faculty • Emphasis in diversity (incudes women and minorities) • Department heads	• Scholarly Work • Research • Teaching • Leadership • Mentoring • Promotion/Career development • Service • Work/life balance • Team building • Collaborative & professional (internal/external) networking (e.g., government agencies national labs /industry partners) • Awards and Recognition	• Advancing research • Advancing teaching (skills/curriculum/ programs) and advising • Encouraging faculty service at funding agencies (name of positions) • Proposal writing for government (NSF, NIH, DoD, DOE, AFSOR) and industry funding • Relationship building for research with government funding agencies (NSF, NIH, DoD, DOE, AFSOR, national laboratories) and industry • Broadening participation	• Funding agency visits • Relationship building network • Work/life balance • Diversity issues in STEM • Engineer-to engineer peer mentoring; • Funding/publications/ service/ teaching • Retention, Promotion, Tenure • Cross disciplinary collaborative research; • Building community: while cultures vary within engineering departments, the college culture is unique and like-minded within the engineering faculty community • Reinforcing environment of excellence for recruitment and retention of faculty • Broadening participation

Table 1: Programs and opportunities that serve all faculty collectively or specific to rank and/or career stage

The overarching guiding approach to career development is to bring faculty together to learn from one another[7]. Some programs are focused on individuals and cohorts while others emphasize team building and collaborative activities. Another step taken toward this goal has been the creation of a series bringing together faculty members at certain stages in their careers, giving them the opportunity to engage in a roundtable discussion with "faculty sages". Topics include how to navigate career milestones such as reappointment, pursuing promotion for both tenure-track and non-tenure-track, and tenure and full professorship. The following descriptions incorporate some key goals and outcomes associated with a sampling of programs.

5.1 Activities and Programs Rationale

Examples of activities and programs are:
- COE research collaboration activities such as a research sharing and exchange named "Collab-a-dating"
- COE rank-inclusive funding agency, national laboratory, industry visits
- Workshops that connect COE faculty with University-wide faculty such as National Science Foundation (NSF) IGERT workshops

"Collab-a-dating" is an activity that was designed to bring down silos, stimulate cross-discipline collaborations and serve all ranks. Faculty representing departments across the College each created an at-a-glance 'bio-board', a one-page laminated pictorial summary of name, research area and current research project. Participants were divided into two groups positioned in pairs opposite each other on two sides of a long table and engaged in a controlled series of ten minute research exchanges. The activity stimulated integrative and collaborative research conversations, built relationships across rank and disciplines, and resulted in the pursuit of collaborative funding.

Agency, national laboratory, and industry visits began in 2009. The COE Associate Dean led faculty on annual visits to funding agencies, national laboratories, and industry partners. Initially created to empower junior faculty to connect with funding agencies, industry associated program directors and researchers, Faculty Development created a paradigm shift in the program when mid- and senior-career and non-tenure track faculty expressed strong interest in participating. Trips were then also tailored to mid- and senior-career and non-tenure track faculty to stimulate new energy and opportunities and broaden current research development. The program has been instrumental in achieving connections for all faculty resulting in new proposals, invitations to serve on panels, new collaborations and opportunities for their graduate students. An added outcome of group travel has been the enhancement of cross-departmental camaraderie, community and collaboration and the formation of new cohorts.

COE Faculty Development planned NSF IGERT workshops with express purpose of connecting faculty across the university with former IGERT directors and other NSF IGERT grant recipients. The goal of the workshops was to create interdisciplinary connections between IGERT grantees and those seeking IGERT grants. A National Science Foundation (NSF) program established the Integrative Graduate Education and Research Traineeship (IGERT) program in 1997. It currently consists of over 125 award sites that consistently deepens the interdisciplinary knowledge, experiences, and professional and academic skills of American Ph.D. scientists, engineers, and educators. The NSF IGERT program encourages the awardees to be cultural change agents, "by establishing innovative new models for graduate education and training in a fertile environment for collaborative research that transcends traditional disciplinary boundaries[8]. In 2010 the NSF IGERT program was renamed as NSF Research Traineeship Program (NRT).

5.2 Programs and Initiatives Supportive of Rank

The COE Faculty Development Office serves a community of approximately 300 faculty which includes non-tenure track (teaching and research professors and lecturers) and tenure-track early career faculty, mid-career faculty, and senior faculty.

5.2.1 Non-Tenure Track Faculty

In a targeted initiative, the COE Faculty Development Office provided mechanisms for non-tenure track faculty to be promoted through enhanced recognition of their scholarly work, leadership, research and teaching. A program of initiatives for non-tenure track faculty grew out of discussions between the COE Associate Dean and the university vice provost of faculty development about best practices and promotional policies that were already in place at the University level[9]. The COE Associate Dean was in a position to advocate for and with COE non-tenure track faculty on enriched career development at the intersection of university policy and departmental culture. As a result, the COE Teaching Professors Learning Community was formed to create a community with shared goals and interests under the leadership of a seasoned non-tenure track professor. The non-tenure track Teaching Professors' Learning Community continues to bring together a cohort of engineering teaching faculty to share ideas about teaching and learning, best practices, to learn from invited speakers, to maintain connections and to deepen their knowledge and expertise in their engineering fields. As a follow up to a non-tenure track faculty funding agency trip, several design instructors on the visit initiated a cohort of COE design instructors. Their goal was to build relations with other COE design instructors, share best practices, encourage collaboration, and enhance the way they teach design.

5.2.2 Tenure Track Early Career Faculty

Some of the most relevant COE Faculty Development programs for tenure track early career faculty consisted of new faculty workshop; CAREER workshop; Retention, Promotion, Tenure roundtables; and NSF introductory funding agency trips.

The new faculty workshop in its eleventh year continues as a core component of the initiatives. Senior-career facilitators deliver a workshop that is at the nexus of the developing teaching excellence, research scholarship and keeping a balance in all things of an engineering faculty nature. We continue to develop satellite New Faculty programs to complement the core activity throughout the year. Faculty value the teaching components; information on mentoring and advising students; managing research; funding information; proposal writing; building a network of peers in and outside of their departments; and the commitment they perceive from interaction with college administrators and department heads.

The CAREER Proposal Writing Workshop Series began as a short follow up session to the new faculty orientation workshop and developed into a workshop series including a full day interactive workshop, a visit to NSF, and one-on-one proposal reviews for early career faculty. Introduction to Funding Agency trips entails visits to NSF for a structured program with NSF program officers and meetings with NSF program officers in each faculty's field of research; and industry partners. Faculty attest that they most value reviewing their proposals and summaries with senior faculty; strategizing career plans; receiving insight from awardees and reviewers.

The Retention, Promotion, Tenure Process Roundtable invites pre-tenured faculty to interactively learn about the process as it relates to the COE. Faculty receive sage advice from the former Retention, Promotion, Tenure committee members on handling constructive criticism; important points; rule changes, and vote impact with opportunities for Questions and Answers.

Of particular impact are the College of Engineering Faculty Development Office sponsored visits to funding agencies for junior faculty to gain perspective of funding processes, distinctions among agencies, current research interests being funded and to forge relationships with program managers in their fields. Faculty attest that trips have resulted in panel memberships, contracts for students with a national labs, beneficial relationship building with and guidance from program managers, and cross-discipline collaborations.

5.2.3 Tenure Track Mid-Career Faculty

Research indicates that participating in a professional development programs, positively impacts mid-career faculty's life inside and outside of the academy[10]. In addition, faculty reported that their energy and enthusiasm was recharged from these experiences. Faculty observed enhancement in their knowledge, teaching satisfaction, and confidence[10].

Recognizing needs unique to mid-career faculty, the COE Faculty Development Office provides programs tailored to promote productivity and career refreshment such as NSF funding agency and national laboratory trips to renew and forge new acquaintances and stimulate new research ideas, and meetings with external research visitors.

Key "Just in time" programs address opportunities and challenges. A fair amount of time is devoted to responding to the needs of mid-career faculty focused on jump starting collaborative research relationships with agencies, national laboratory and industry partners. Other programs address personal aspects of professional development in areas of making meaningful sabbaticals and faculty-to-faculty mentoring.

Funding Agency and national laboratory trips provide agency program directors and managers presentations on topics relevant agency programs, opportunities, and experiences; faculty presentations to and individual meetings with program directors and managers. Faculty report benefits of relationship building; input on research proposal ideas; increased proposal success; university/college visibility. Since faculty from multiple engineering disciplines travel together, cross-discipline collaboration becomes a natural outcome.

5.2.4 Tenure Track Senior Faculty

Lastly, the tenure track senior faculty attend relevant programs made available through the COE Faculty Development Office that include funding agency, national laboratory, and industry trips; agency visits for faculty that are in funding transition; connections with new funding opportunities (i.e., Sandia, EPA, and NSF); collaborations for research. Programs also engage them in opportunities to mentor early/mid-career faculty as well as serve as sages to share knowledge, expertise, experiences and wisdom. There is also the opportunity to identify pathways to positions as programs directors/rotators at national funding agencies.

Unlike the new early career faculty, many programs are geared towards faculty obtaining resources for research. The novelty of senior faculty participation in these programs is their

ability to pursue new opportunities in a manner that does not judge a temporary reduction in funding or an interest in a new research direction.

5.2.5 Women and Minority Faculty (Tenure and Non-Tenure Track)

While the number of women and minority faculty in STEM have increased, there is still a lower number of women and minorities entering the academy[11-12]. Barbezat (1992) and Xu (2008) have credited these issues to work environments that were non-collaborative and non-teaching-focused. Barbezat also reported that women STEM faculty perceive these work environment to be "isolating"[11].

Xu (2008) conducted a research study that compared the intentions of attrition and turnover between genders in STEM research and universities and found that both genders did not differ in their intentions to leave academia[12]. However, his research showed that "women faculty had a significantly higher likelihood to change positions within academia"[11] (p. 607). Both genders are equally committed to their STEM academic professions. However, women STEM faculty had stronger turnover intentions that were highly linked to their dissatisfaction with research support, advancement opportunities, and free expression of ideas[12]. "The findings suggest that the underrepresentation of women is more convincingly explained by an academic culture that provides women fewer opportunities, limited support, and inequity in leadership, rather than by gender-based differences such as roles in family responsibilities. Changes in academic STEM culture are needed in order to attract more women scientists and narrow the current gender gap"[12](p. 607).

Sensitive to the issues that these faculty experience that will help women and minority faculty, the COE Faculty Development plans programs and initiatives that address topics that will help faculty navigate through some unique challenges with success. The goal is to equip faculty with knowledge and skills through interactive workshops such as the importance of self-advocating for engineering awards; the importance and methods of branding; handling incivility with skill and grace; early and mid-career conversations with senior women and minority faculty around engineering visions for success. External visitors are invited to engage faculty in roundtable topics such as ADVANCING and Supporting Women in STEM Disciplines through Cohort Based Faculty Development Academies and NSF Advance Programs; Building a Model of Collaboration & Entrepreneurship Between Historically White and Historically Black Universities; and Diversity and Mentoring Across Differences.

6. Assessment

To perpetuate a sustainable faculty development program, it is essential to monitor the interests and expectations of the faculty the office is serving. The engineering faculty development office conducted a college-wide faculty survey about the program of offerings that were provided for engineering faculty over the past 6 years (2009-2015).

A comprehensive assessment of programs was conducted in the form of a survey and was sent to over 300 engineering faculty of all ranks with a response rate of 31%. The goal of the survey was to explore areas most relevant and beneficial to faculty at various stages of their careers. Keeping in mind that this survey was not designed to capture quantitative measures of changes such as an increase in research dollars awarded or professional recognition, the goal of the assessment was to learn from the faculty which programs and initiatives were the most

relevant and beneficial to them in order to ensure that future activities and endeavors meet needs in research, scholarly work, professional development and career advancement. While informal evaluations have provided valuable feedback for faculty development program planning, the administration of the current formal assessment has shown the value of establishing a more strategic evaluation plan going forward.

The results of the assessment, regarding the faculty development Program's impact, clearly show that it has changed the way engineering faculty collaborate and it has significantly facilitated the ability of faculty to address specific grant writing and funding proposal needs. Table 2 shows the total response rate percentages of program categories were most relevant (i.e. extremely beneficial; beneficial) to all respondents

Networking	Promotion & Tenure	Funding & Research Development	Teaching
75%	65%	63%	61%

Table 2: Top rated response rate percentages of program categories

Some of the open-ended responses in table 3 exemplify interests and needs which the COE Faculty Development Office team will strategically consider in plans for continued or new programming.

Examples of Open-Ended Responses from Participants
Career opportunities after tenure. Possibly small group discussions focusing on pros and cons of each path.
How to build a sustainable research program.
Pitfalls of Industry/Academic Collaboration; How to build network across Industry R&D
How to be an effective Academic Leader?
Lab management as opposed to student management.
Bridging the divide between secondary and higher ed. How faculty can best prepare for and serve disparate populations, gearing new students for success in college and beyond.
More workshops on building community for underrepresented faculty.

Table 3: Examples of open-ended responses from COE Faculty Development program participants

7. Reflections and Lessons Learned

The beauty of the structure associated with this new faculty development venture was the fact that we were free to modify approaches to content and delivery of programming as needed. That need was determined by our constant listening to the faculty and the college leadership relative to the career roadmaps of early career and senior faculty. We are still in the process of implementing the outcomes from the lesson learned mode and some of the observations below are gleaned directly from the ongoing assessment of our programs.

7.1 Time and Location of College of Engineering Faculty Development Initiatives

Being respectful of faculty time demands and constraints, the COE Faculty Development Office offered programs at varying times. It is important to take into account the faculty's teaching schedules, research and writing demands and deadlines, travel time: vary times that programs are offered, overcome travel inconveniences by utilizing technology with formats that

include webinars, google chats, etc. Established programs mature, presenting challenge as well as opportunities to introduce new initiatives.

7.2 Changing Landscape of Faculty Development

One key aspect of COE Development Office activities is the changing landscape of research, university regulations/requirements and the opportunities that arise without a great deal of notice. It is important to be responsive in the organization of visitors, coordination of meetings and seminars, resource development, partnering with various constituencies across campus and at the national level and the resulting administrative overhead (e.g., travel processing, registrations, notification, etc.). As faculty move up in rank, it is important to recognize the need to engage a whole new breed of full professors following those who are close to retirement.

7.3 Duplication

Our intention is to plan programs and initiatives that are uniquely geared toward engineering and not to duplicate offerings available at the university. In an effort to be strategic and not duplicative, we will collaborate with the university office of faculty development and encourage our faculty to utilize the provost's office suite of activities that are beneficial to our COE faculty.

7.4 Communication

There is a need to enhance streamlined communications methodology to contact the faculty and record the participation of faculty and COE leadership. Respecting demanding faculty schedules and associated constraints on faculty time, increase the use of website as a common tool (i.e., webinars, google hangout; etc.) There is also a need to continue to build media site classes for faculty access to content on relevant career development activities.

8. Overcoming Challenges

Implementing a COE specific faculty development program requires active engagement with leadership in departments with different cultures and coordination with college and university level initiatives. Advisory roles in faculty-administration execution of promotion, tenure and retention policies must act as a connector to provost's office, incorporating national policy trends in research and education into faculty training. Development of college level best practices mandates leadership in faculty recruitment in addition to adjustment in recruitment policies in cooperation with the provost level policies and national policy trends. This also provides a strong foundational dialog in the reappointment, promotion and tenure process, another core responsibility of the COE Associate Dean.

9. Conclusion

Over the past eight years the COE Associate Dean and faculty development staff established a new office and led in the development of innovative programs for engineering faculty utilizing on-campus and off-campus resources. The office provided leadership for department, college and university level policies for both tenure-track and non-tenure track faculty. The partnership with department heads, university level leadership, senior faculty and early career faculty has created a robust community of faculty that are connected and committed to the comprehensive career success of faculty at all ranks.

The office is now responsible for faculty development, all faculty promotion and tenure review processes and mentoring among COE faculty. The office also continues to work on special initiatives that seek to broaden participation in STEM.

Continued sustainable growth and upward trajectory of the COE Faculty Development Office at NC State will be predicated on the infusion of new ideas and initiatives aligned with the college and university's strategic vision for STEM education and research. Faculty advancement is a joint effort, required college level leadership and commitment through the provision of resources and permanent dedicated personnel. In this instance, the quest for faculty success is the overarching driving force, promoting a faculty community connected across all ranks, and working together to lift each other higher in the academy.

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