Motivational Factors Influencing Engineering Faculty's Pursuit of Instructional Faculty Positions at Hispanic-Serving Institutions

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***Abstract*—This work-in-progress (WIP) research paper seeks to explore the diverse backgrounds and experiences of engineering instructional faculty (EIF) and what motivates them to pursue their current positions at Hispanic-Serving Institutions (HSIs). Full-time, professional-track faculty focusing on either teaching or research, who are often not eligible for tenure, are a growing population in higher education and remain an under-explored and under-supported group in engineering. Of those in teaching-focused positions, these professional-track faculty typically teach critical courses within a student's curriculum, such as first-year, introduction to engineering, design, or other foundational courses. Therefore, to understand the impact their various backgrounds, and personal and professional experiences have on their current positions, this WIP describes an exploratory study aimed at communicating the motivations of these EIFs for transitioning into professional-track faculty positions at HSIs. Preliminary data analysis suggests that even with a diverse educational and work background, EIFs share motivational factors, such as a desire for work-life balance, enthusiasm for teaching, enthusiasm for learning, and enthusiasm for their engineering discipline that played an important role in their decision to pursue an EIF position at an HSIs.**

Keywords—Engineering Instructional Faculty, Professional-track Faculty, Motivation, Hispanic-Serving Institutions, Academic Career

I. Introduction

Full-time, professional-track faculty focusing on either teaching or research, who are often not eligible for tenure, are a growing population in higher education. These faculty represent 25% to 50% percent of faculty across all departments at two and four-year institutions [1],[2]. Within engineering, those professional-track faculty focused on instruction usually teach lower-level courses and provide industry experience in upper-level courses [1],[3]. They also tend to have a high number of contact hours with engineering students across a curriculum, especially in the first years where retention is most important [3],[4]. Engineering instructional faculty (EIF) play a critical role in students' educational experiences [1],[3], by 'supporting students' self-efficacy, self-regulated learning behaviors' [5],[6], and by serving as role models inside and outside the classroom [7]. These faculty, whose primary responsibility is teaching, report using active learning strategies more often than their tenure-track peers [8] and view themselves as professional teachers rather than striving academics [9].

However, despite their critical role, limited professional development and institutional support opportunities are designated for professional track faculty, and overall they are an under-explored and under-supported group [1],[3]. On the other hand, when these instructional faculty receive the support they need, such as fringe benefits, a stable salary, the possibility of a flexible work schedule, good working conditions, and access to resources [10], they can create peer networks, reclaim their agency, and reassert their professionalism and value [11],[12]. The professional track not only represents an opportunity to fulfill their desire to teach [9], but in the right conditions, could offer faculty several benefits, such as additional income, personal enjoyment, and prestige due to their association with a university or college [10]. Understanding professional-track faculty's career goals can help us build engineering programs that support their motivations and encourage them to actively build and strengthen those programs [9].

II. Purpose and Research Questions

Engineering education research has begun documenting the teaching impact of EIF, their increased use of active learning strategies, and their self-perception as professional teachers [3],[8],[9]. Yet, limited research exists on EIFs at Hispanic-Serving Intuitions (HSI). HSIs, designated as such for having over 25% of their undergraduate student population identifying as Hispanic or Latinx [13], are leading innovative programming and curriculum for Latinx students [14]. More than 60% of Latinx students who pursue higher education degrees are pursuing degrees at HSIs [14],[15]. Therefore, with their increased contact hours and larger populations of Latinx students at HSIs, this faculty population can contribute to students' higher satisfaction and persistence as they progress through their degree, broadening participation within engineering [9]. With the growing diversity in student populations and the critical need to support broadening participation efforts in engineering, the need for instructional faculty will likely increase at HSIs. Thus, more research on their experiences and approaches for recruiting and retaining these

faculty is needed. Therefore, this exploratory study seeks to identify the factors that motivate teaching-focused professional-track faculty to pursue engineering instructional faculty positions at HSIs. The research question guiding this research study is: *What factors motivated engineering faculty to pursue their current instructional faculty position at an HSI?*

III. Methods

As part of a larger multiple case study exploring the career pathways and teaching perspectives of EIFs at HSIs, this paper describes an exploratory analysis of the experiences of EIF from across the southwestern and southeastern United States. The current study explores the motivational factors that influenced these EIFs' decisions to pursue their current faculty position at an HSI. Interview data from each faculty participant was used to characterize the journeys of these instructional faculty, focusing on the critical incidents related to their prior experiences and motivations for shifting careers.

Study participants were recruited from six HSIs: two 4-year public universities (n=7), two 2-year public colleges (n=5), and two 4-year private universities (n=5). A survey was distributed at each of the selected HSIs to faculty that, based on the institutional websites, were identified as EIF. The purpose of this survey was to obtain informed consent and screen for eligible participants. Survey questions covered demographic information (Table I) and information pertinent to their current role and responsibilities, such as years of teaching experience, position title, and type of institution (Table II). Using this approach, seventeen EIF participants were recruited to complete a two-part interview intended to capture and understand their diverse motivations to become instructional faculty and their experiences as such.

TABLE I. Demographics of Participants including pronouns and race/ethnicity

Pronouns[a]	**N**	**% Sample**
He/His	5	29.4%
She/Her	9	52.9%
Prefer not to answer	3	17.6%
Race/Ethnicity		
Asian	1	5.9%
Asian & White	1	5.9%
Latinx	7	41.2%
Latinx & Italian	1	5.9%
White, non-Latinx	5	29.4%
Prefer not to answer	2	11.8%

[a] *The pronoun they/them was an available option but no participants identified as such.*

Virtual interviews were conducted with each participant and lasted 45-60 minutes. Three interviewers used the same nine guiding questions, with optional follow-up questions, to maintain consistency across all interviews. Each of the interviewers piloted the interview protocol to ensure consistency further. A video-conference platform was utilized to audio-record the interviews. The recordings were then transcribed and de-identified for analysis.

The transcripts were coded in NVivo, a data analysis software used for qualitative and mixed-methods research. The analysis was performed using a constant comparative analysis approach to explore emerging themes about the participants' decision to pursue an instructional faculty position at their current institution [16]. The emerging themes were sorted and defined into a codebook to capture the personal and professional motivational factors of each EIF as they pursued their current position.

TABLE II. Work experience of participants including years of teaching experience, years in their current position, and institutional type

Years of Teaching Experience	**N**	**% Sample**
0-5 Years	3	17.6%
6-10 Years	5	29.4%
11-15 Years	3	17.6%
16-20 Years	2	11.8%
21+ Years	4	23.5%
Years in Current Position		
0-5 Years	10	58.8%
6-10 Years	5	29.4%
11-15 Years	1	5.9%
16-20 Years	1	5.9%
Institutional Type		
4-year Public	7	41.2%
4-year Private	5	29.4%
2-year Public	5	29.4%

Two researchers analyzed three interviews together to establish a clear set of categories, definitions, and examples for the codebook. To ensure consistency, the analysis was conducted by two investigators who did not participate in the interviews. The remaining interview transcripts were coded separately, calculating inter-rater reliability using NVivo to check their consistency. The minimum degree of agreement between the researchers was 90% per code; the investigators reviewed anything below this percentage to reach a consensus. Progress was shared every week with the entire research team to provide critical peer debriefing.

IV. Limitations

This WIP is part of a larger study that consists of two rounds of interviews. The results presented in this paper only include data obtained from the first of the two interviews. Other limitations of this study include the lack of participants from 2-year private HSIs. However, since our focus is on HSIs with engineering programs, there were no known 2-year private institutions that were eligible for the study. Although we acknowledge the limitations of our small sample size, the purpose of this exploratory study is not generalizability but the documentation of in-depth and rich stories of EIF's experiences.

V. Results and Discussion

The themes that emerged during data analysis include **personal motivational factors** related to (1) a desire for work-life balance, (2) a family member's work relocation, and (3) a need for financial stability. **Professional motivational factors** include (1) enthusiasm for teaching, (2) enthusiasm for learning, (3) enthusiasm for the engineering discipline and/or field, (4) enthusiasm for research, (5) flexible work schedule, (6) career advancement, and (7) enthusiasm for service. Due to the small size of the sample and to ensure the confidentiality of the participants, we present our results using the personal pronouns they identified within the screening survey, discussed in the methods section.

A. Personal Motivational Factors

a) Work-life balance

A desire for a healthy work-life balance was the most prominent personal factor that motivated these EIF to pursue their current positions. This factor was mentioned by 9 out of the 17 participants. Of the 9 participants who identified themselves using the pronouns she/her, 6 cited work-life balance as a personal motivator. Of the 5 participants who identified themselves using the pronouns he/his, 2 mentioned work-life balance as a factor to choose a career in academia. Lastly, 2 out of the 3 participants who did not specify their pronouns, mentioned work-life balance as a motivator. Participants emphasized that having children and spending time with their families was a big aspect driving their decision-making. As one faculty member (she/her pronouns) explained:

"I have three kids, so academia works really great for my kids. When I was finishing up college, I got married in college. And I started teaching while my husband was finishing up his degree."

These findings are consistent with existing literature where women, overall, are more likely than men to feel stressed and experience psychological consequences related to work-family tension, leaving them feeling emotionally drained at the end of the workday [17]. More specifically, women serving as engineering faculty felt they were constantly balancing their role as wife and mother with their role as professor, causing them to feel anxious [18].

Other personal motivators that were less frequently identified include a family member's work relocation (n=3) and the need for financial stability (n=1).

B. Professional Motivational Factors

a) Enthusiasm for teaching

Within the professional motivational factors, enthusiasm for teaching was a prominent category; it was mentioned by 12 out of the 17 participants. This category was popular among the participants from the 2-year public colleges; all 5 participants working in these institutions expressed their enthusiasm for teaching as one of the main reasons they pursued an EIF position. These findings reinforce prior studies that point out the importance of the participation of professional track faculty to achieve the educational mission at 2-year colleges [19]. From the 4-year institutions, 4 out of the 7 participants from the public universities and 3 out of the 5 participants from the private universities mentioned this category as an important factor in seeking an instructional faculty position.

This enthusiasm for teaching as a key motivator aligns with studies of job satisfaction of instructional faculty. Instructional faculty have reported being more satisfied with their work when engaging with students and developing new courses and laboratories [8],[18]. The statement made by one of the participants (she/her pronouns) from a 4-year public university further illustrates this:

"And I was excited about it because that's [knowledge gap between education and industry requirements] exactly why I chose to come back and pursue my doctorate, [it] was because I wanted to focus on the teaching aspect and try to make the curriculum, try to improve it and try to include aspects that students would actually need in their career."

Although teaching is not as highly regarded within the academic community, instructional faculty seem to spend most of their time teaching; in some cases, this can be perceived as having less time for research [20]. However, even when conducting research early in their faculty career or during graduate school, participants seemed to gravitate towards teaching. This trend continues for professional engineers whose desire to teach engineering students how to become professional engineers led to their transition from full-time positions as practicing engineers to full-time teachers [9]. The following statement by one of the participants (she/her pronouns) from a 4-year private institution illustrates her enthusiasm for teaching:

"In the process of doing that [pursuing a doctoral degree], because I went for an advanced degree, I got into the hang of research and I really fell in love with teaching and that's the short condensed version of how I ended up here."

b) Enthusiasm for learning

Enthusiasm for learning was another category mentioned by the participants as a professional factor motivating them to pursue an EIF position. Five out of the 17 participants shared their enthusiasm for learning as one of the main reasons they joined academia. The EIF interviewed in this study expressed how they constantly seek different opportunities to learn. On the one hand, some of the participants expressed how they see their work as an opportunity to learn alongside their students during class activities or contribute to team projects. As an example, one EIF (he/his pronouns) stated:

"Those projects relate to my interests that I wanted to pursue. Not necessarily research in itself, but I just wanted to give the students the opportunity of doing research. At the same time, helping me out and continue with the same interests that I have."

On the other hand, the instructional faculty members in this study also expressed how they see their career in academia as an opportunity to keep growing professionally and improve their teaching skills. This is exemplified in the following statement made by one of the participants (she/her pronouns):

"I reached to a limit that I pretty much explored everything…I couldn't do anything new or go to the next level. I said, "You know. I can start doing more." So, I really went for just the being able to collaborate again with the [4-year public institution] and they had a need for somebody to teach a course."

Literature shows that non-tenure-track faculty focused on teaching find continuing education opportunities in the area of engineering education valuable [9]. Providing resources such as

professional development could help maintain the motivation of these EIFs to constantly learn and grow.

c) Enthusiasm for the engineering discipline and/or field

Lastly, 4 out of the 17 professional-track faculty interviewed in this study expressed their enthusiasm for their discipline as part of the reasons why they pursued their current position. In this case, the passion for their field was expressed in several forms. One of the participants explained how she enjoys including applied engineering exercises in her day-to-day classes:

"The applied part of it [engineering] is just really empowering to me that you can take a problem and define it and have a tangible, real solution to it."

This practice is aligned with instructional activities based on real-world situations, promoting students' interest and contributing to a more engaging learning experience [21]. On the other hand, 2 participants expressed how their EIF position allows them to stay connected to their field. The first participant expressed how he can work outside of academia during the summers as a consultant due to his 9-month appointment. The second participant expressed how her position allowed her to keep working on what she was passionate about ever since she was a child. In the case of these last two participants, their disciplinary interests played an important role in their decision and overall motivation process to become an instructional faculty, aligning with the literature connecting interest with enhanced learning and serving as a guide for academic and career trajectories [21], [22].

Other professional motivators that were less frequently identified during analysis include enthusiasm for research (n=3), flexible schedule (n=3), career advancement (n=3), and enthusiasm for service (n=1).

VI. Future work

Moving forward, we hope to explore further the personal and professional motivational factors of this group of EIFs. A personalized profile of each instructional faculty will be developed to obtain a more comprehensive understanding of their individual experiences, motivations, and career pathways. This in-depth profile could provide a thorough explanation of the roles played by these factors as part of the EIFs' decision to pursue a professional-track position. In addition, we will explore other aspects mentioned by the participants in the interviews that were not part of the scope of this paper. This includes the roles they play in their academic unit and classroom, their interactions with students, faculty, and administrators, and the impact these roles and interactions have on diverse aspects of EIF's career and development.

Lastly, as part of the main project, the second round of interviews will take place. In addition to addressing any questions that emerged during the data analysis for this WIP, the follow-up interviews will focus on participants' work environment and professional development experiences that these EIFs have encountered in their current position.

VII. Conclusion

EIFs are an under-explored and under-supported group that play an important role in undergraduate students' educational experiences and their decision to remain in the engineering field [1],[3],[4]. With the professorate changing and the continued increase in professional-track faculty positions, this study sheds light on the importance of EIFs in engineering at HSIs. Data analysis suggests that EIFs share various personal and professional factors that motivated them to pursue a position in academia. On the one hand, the main personal motivational factor identified in this study was their desire to have work-life balance. On the other hand, the main professional motivational factors identified in this paper were EIFs' enthusiasm for teaching, enthusiasm for learning, and enthusiasm for their discipline. As engineering programs at HSIs continue to recruit instructional faculty, they may wish to consider the different motivations that lead candidates to their programs. Overall, this paper seeks to highlight EIFs' personal and professional motivations to pursue their current position in hopes to further promote and nurture EIFs' efforts towards educational innovation, their practices, and values.

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