

Benchmarking the Experiences of Teaching-Track Engineering Faculty: A Multi-Institutional Survey Approach

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Abstract

This work-in-progress paper builds on prior research focused on teaching-track faculty in chemical engineering departments and expands the scope to include a broader set of engineering disciplines. The project centers on the development and implementation of a national survey designed to capture the professional experiences of Teaching Focused Faculty across approximately 48 large engineering universities in the United States. The anonymous survey will target departments in civil, chemical, electrical, mechanical, and industrial engineering. It will collect data on teaching load, service and scholarship expectations as well as opportunities for promotion and professional development. The survey will also include questions about salary. Open-ended questions will invite faculty to share their personal experiences and perspectives. While survey results will not yet be available, this paper will detail the survey design process, including instrument development and recruitment strategies. The goal is to establish a benchmark tool that enables cross-departmental and cross-institutional comparisons and informs faculty development initiatives aimed at supporting and advancing teaching-track faculty in engineering education.

The role of non-tenure track faculty in engineering has been overlooked and understudied. This can lead to those faculty feeling isolated and can also lead to confusion about ways to hire, support and reward the important work done by these faculty [1] – [3]. In this study, we are defining “Teaching Focused Faculty” (TFF) as those whose primary job is teaching and are not tenured or tenure track. This work in progress seeks to bring to light the number and function of TFF in Engineering at large public R1 institutions around the country through a survey to engineering TFF across the country.

This work is grounded in the Ecological Change Model [4]. The Ecological Change Model suggests that faculty experience and well-being are shaped by the dynamic interaction of personal, social, and environmental factors, emphasizing that sustainable change requires alignment across these interconnected levels rather than isolated interventions. In this model, we consider that there are multiple levels of support that can be provided for these faculty. These include the Individual level (personal satisfaction), Social level (how individuals interact with others) and Environmental level (how the institution supports TFF). Previous work has shown that, on the individual level TFF experience a high level of career satisfaction [1]. At the same time, TFF often report feeling like “second class citizens,” a perception shaped by both Social and Environmental factors within their institutions [2]. At the Social level, interactions with colleagues and leadership may reinforce marginalization when TFF are excluded from key decisions, leadership roles, or professional opportunities. At the Environmental level, institutional structures such as deficit-based titles (e.g., “non-tenure track,” “fixed term”), unclear promotion criteria, and inconsistent advancement pathways can further signal reduced status and limit long-term career growth.

Our previous work [6] – [8] focused on TFF in chemical engineering and showed that TFF make up about 10% of chemical engineering faculty and that 80% of these faculty were located at R1 (very high research activity) institutions where these TFF were hired to fill gaps in teaching. This work confirmed that, historically, these jobs were not posted widely and were given to people known to the departments. We also showed that this trend is changing and teaching roles are being advertised nationally, resulting in a “professionalization” of the role. In chemical engineering, these faculty tend to teach the lower-level engineering classes as well as the classes that include teamwork (e.g. lab, design). They serve as academic advisors, advisors to student groups and lead the undergraduate programs and ABET. Although their primary responsibility is teaching, almost 40% of the TFF surveyed participated in some kind of engineering scholarship with 38% presenting work at ASEE. Finally, recent work [8] has shown that the average salary for TFF in chemical engineering at all levels is lower than the offer given to Assistant Professors being hired. Open ended questions showed that, while some TFF feel valued, some feel overworked and undervalued compared to their contribution to the departments. This information is important to department heads and candidates for these positions and speaks to the experience of these faculty in chemical engineering at the individual, social and environmental level.

Our goal here is to expand this work in chemical engineering to include other engineering departments by distributing a survey to hundreds of TFF in engineering departments around the country. The latest American Society for Engineering Education report in 2023 [9] found that

there are 5,494 non-tenure track faculty who make up 15.2% of the total faculty in engineering. Our survey will provide a baseline of workload, including teaching, service and scholarship, as well as compensation of these faculty. This compensation includes salary and professional development support. One outcome of the current study will be suggestions for better supporting TFF in engineering from an environmental and social level. Another outcome will be to probe how TFF feel supported on an individual level.

Our research questions for this study are listed below:

- Are there statistically significant differences between engineering departments in workload (teaching, service, scholarship), support (funding for conferences, professional development opportunities), and compensation (salary, summer pay)? Do these mirror differences for tenure-track and tenured faculty?
- How have hiring practices changed for TFF? Historically, positions have been created for TFF based on availability of local talent [1]. Recently we have seen an increase in national searches for these positions. Is this a trend across all institutions and departments?
- What are the personal reasons that TFF chose this position? What do they find rewarding about this position?

The results of these research questions will be a more complete understanding of the structures in place in various engineering departments as well as the personal reasons faculty find themselves in TFF roles. This understanding will inform ways to support these faculty.

Deciding on scope of work

To limit the scope of this work, we have decided to focus on 48 public, R1 institutions in the Big 12, SEC, ACC and Big 10 network that have engineering programs as shown in Table 1. It is difficult to get the total number of TFF we expect to reach with this survey. One approach is to count the total number of faculty at each school. Recent ASEE data lists the top 50 schools in terms of faculty size [9]. Twenty-five of those schools are in our list resulting in 7400 total tenured/tenure-track faculty. The other 23 schools each have less than 150 faculty so we can hypothesize that the total faculty at all our schools listed might be close to 10,000 – 11,000 tenured faculty out of a total of 30,000 in the country. Given this data, we might expect to reach a total of 1,800 – 2,000 TFF with our survey. This encompasses about one third of all 5494 TFF in engineering in the country.

Table 1. Universities included in the survey

Big 12	SEC	ACC	Big 10
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▪ Arizona State University ▪ Iowa State University ▪ Oklahoma State University ▪ Texas Tech University ▪ University of Arizona ▪ University of Central Florida ▪ University of Cincinnati ▪ University of Colorado Boulder ▪ University of Houston ▪ University of Kansas ▪ University of Utah ▪ West Virginia University	▪ Auburn University ▪ Louisiana State University ▪ Mississippi State University ▪ Texas A&M University ▪ University of Alabama ▪ University of Arkansas ▪ University of Florida ▪ University of Georgia ▪ University of Kentucky ▪ University of Oklahoma ▪ University of South Carolina ▪ University of Tennessee, Knoxville ▪ University of Texas	▪ Clemson University ▪ Florida State University ▪ Georgia Institute of Technology ▪ North Carolina State University ▪ University of California, Berkeley ▪ University of Louisville ▪ University of Pittsburgh ▪ University of Virginia ▪ Virginia Tech	▪ Michigan State University ▪ Purdue University at West Lafayette ▪ Rutgers, The State University of New Jersey ▪ The Ohio State University ▪ The Pennsylvania State University ▪ University of California, Los Angeles ▪ University of Illinois at Urbana - Champaign ▪ University of Iowa ▪ University of Maryland College Park ▪ University of Michigan ▪ University of Minnesota - Twin Cities ▪ University of Nebraska - Lincoln ▪ University of Washington ▪ University of Wisconsin - Madison
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Development of instrument

The instrument used in this study can be found in Appendix A and was adjusted from the chemical engineering survey previously used. The survey described in this paper focused on the work done by TFF, the professional development opportunities and the department and personal demographics. A summary of the questions included are shown below. It also includes some open-ended questions to gauge how faculty found themselves in this role and what support they currently receive and would like to receive.

Section 1: Teaching and service and scholarship

- How long have you been a TFF?
- Contract length?
- How many courses/sections do you teach in academic year?
- How many students in each course/section?
- How many courses do TFF teach?
- How many courses do tenure track/tenured faculty teach?
- What service do you do? (lead ABET, advise student groups, lead UG program, academic advisor)
- Did you work in industry after your BS? How many years?

- Are you working on:
 - engineering education scholarship?
 - technical engineering scholarship?

Section 2: Professional development

- What is your current title?
- Have you been promoted?
- Does your institution have a policy for promotion of TFF? Do they have clear guidelines for promotion?
- How did you get your current TFF position?
- What is your base salary?
- What is the length of your appointment?
- Do you receive summer salary? For what? How many weeks of summer salary did you get last year?
- Can you received buy out from teaching? For what?
- Can you take sabbatical?
- Do you receive funding:
 - To attend national meetings?
 - For scholarship?
 - For professional development?

Section 3: Department and personal demographics

- R1, R2, M1, M2, M3, PUI, HBCU?
- How many TFF in your department?
- How many total faculty?
- How many students graduate per year?
- Do TFF have a voice in faculty governance at your institution?
- Age range, race, ethnicity, gender
- Highest degree, US or international education

In addition to the three sections of questions above, we asked some open-ended questions such as:

- What were the circumstances that led you to decide to be in a TFF role?
- What is most rewarding about your TFF position?
- How do you feel your department perceives the role of TFF?
- Do you feel you have the support you need to function well in your role as a TFF?
- What changes would you like to see in terms of support for TFF at your institution?

It is very important that we keep this survey anonymous, especially because of the sensitive nature of the salary data. The respondents will not share any identifiable information such as their name or email. We do not ask the respondents to share their particular school and/or region of the United States. When asking for the age of the participants, we include age ranges to further prevent identifying information. In addition, all the of the open-ended questions contain the sentence: “Please refrain from providing identifiable information about yourself or others as part of this response.”

Plan to distribute survey

We plan to distribute this Qualtrics survey through a contact at each school with a request that they forward the survey to the TFF at their institution. We will give a deadline of 2 weeks with a reminder after 1 week.

Conclusion

Teaching-focused faculty play a critical and growing role in engineering education, yet their contributions, career pathways, and support structures remain poorly understood across disciplines and institutions. This work-in-progress study seeks to address this gap by extending prior research in chemical engineering to a broader examination of teaching-focused faculty across engineering at large public R1 institutions. By targeting approximately one third of all teaching-focused faculty in engineering nationwide, this study aims to provide one of the most comprehensive snapshots to date of the roles, responsibilities, professional development opportunities, and institutional contexts experienced by this population.

The survey instrument and distribution plan described here are designed to capture both quantitative trends and qualitative insights while maintaining respondent anonymity, particularly with respect to sensitive information such as salary and promotion practices. The resulting data will offer valuable evidence to guide more transparent, equitable, and sustainable approaches to hiring, evaluation, professional development. This will be valuable to the TFF as well as those who support them including department heads, deans and faculty development professionals.

References

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Appendix A

TFF Engineering survey

Engineering TFF Survey (Teaching Focused Faculty)

Survey Principal Investigators:

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You are invited to volunteer to participate in a research study. This survey is for Engineering Teaching Focused Faculty (TFF). These are non-tenure track faculty whose primary responsibility is teaching. This survey is anonymous. Anonymous/Summarized/Aggregate results will be published and presented at conferences. It will probably take 10 - 15 minutes to complete this survey. You are welcome to not respond to any question that you don't feel comfortable answering at any point, and you do not give up any legal rights by taking part in this research study. Please feel free to contact Stephanie Velegol (sbv1@psu.edu, 814-865-4907) at any time with questions. Your participation is voluntary and you may stop at any time. Your participation implies your voluntary consent to participate in the research.

You are invited to volunteer to participate in a research study. This survey is for Teaching Focused Faculty (TFF) who teach in Civil Engineering, Chemical Engineering, Computer Science/Computer Engineering, Electrical Engineering, Mechanical Engineering and Industrial Engineering Departments. These are non-tenure track faculty whose primary responsibility is teaching. The purpose of this study is to get baseline information about TFF in these departments in the US. This survey is anonymous. Anonymous/Summarized/Aggregate results will be published and shared with administrators. It will probably take 10 - 15 minutes to complete this survey. You are welcome to not respond to any question that you don't feel comfortable answering at any point, and you do not give up any legal rights by taking part in this research study. Please feel free to contact Stephanie Velegol (sbv1@psu.edu, 814-865-4907) at any time with questions. Your participation is voluntary and you may stop at any time. Your participation implies your voluntary consent to participate in the research.

Which of the following best describes your department? (Feel free to use other if none apply)

- ☐ Civil Engineering
- ☐ Chemical Engineering
- ☐ Computer Science/Computer Engineering
- ☐ Electrical Engineering
- ☐ Industrial Engineering
- ☐ Mechanical Engineering
- ☐ other _____

How long have you been a TFF (Teaching Focused Faculty)

- ☐ <1 year
- ☐ 1 - 2 years
- ☐ 3 - 5 years
- ☐ 6 - 10 years
- ☐ 11 - 15 years
- ☐ 16 - 20 years
- ☐ > 20 years

Are you a full time TFF?

- ☐ yes
- ☐ no

What is your contract length?

- ☐ 1 year
- ☐ 2 years
- ☐ 3 years
- ☐ 4 years
- ☐ 5 years
- ☐ other _____

How many courses are you expected to teach per academic year? If you teach multiple sections of one course, include each section as courses. Don't include recitations or separate lab sections and don't include summer unless that is part of your base pay.

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ other _____

How many students are in each course/section that you teach? (select all that apply)

- ☐ < 10
- ☐ 11 - 25
- ☐ 26 - 40
- ☐ 41 - 60
- ☐ 61 - 100
- ☐ >100

How many courses are TFF (teaching focused faculty) expected to teach per academic year at your institution? If they teach multiple sections of one course, include all each section as a course. Don't include recitations or separate lab sections and don't include summer unless that is part of their base pay. If you aren't sure, offer your best guess.

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ other _____

How many courses are tenure-track or tenured professors expected to teach per academic year at your institution? If they teach multiple sections of one course, include all each section as a course. Don't include recitations or separate lab sections and don't include summer unless that is part of their base pay. If you aren't sure, offer your best guess.

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ other _____

Which of the following roles and responsibilities have you done in the past or are currently doing?

	Never	have done but not now	am currently doing
Lead ABET	☐	☐	☐
Advise student groups	☐	☐	☐
Lead the undergraduate program (UG coordinator, Associate Department head, etc.)	☐	☐	☐
Act as an academic advisor	☐	☐	☐

Did you work in industry after receiving your BS?

- ☐ Yes after receiving my BS and before graduate school
- ☐ Yes after receiving my BS AND after graduate school
- ☐ Yes after graduate school
- ☐ No
- ☐ other _____

If you worked in industry, how many years did you work? (if you didn't work in industry, write N/A) Please refrain from providing identifiable information about yourself or others as part of this response.

- ☐ < 1 year
- ☐ 1 - 3 years
- ☐ 4 - 5 years
- ☐ 6 - 10 years
- ☐ > 20 years
- ☐ N/A

What were the circumstances that led you to decide to be in a TFF role? Please refrain from providing identifiable information about yourself or others as part of this response.

What is most rewarding about your TFF position? Please refrain from providing identifiable information about yourself or others as part of this response.

How do you feel your department perceives the role of TFF? Please refrain from providing identifiable information about yourself or others as part of this response.

Do you feel you have the support you need to function well in your role as a TFF? Please refrain from providing identifiable information about yourself or others as part of this response.

What changes would you like to see in terms of support for TFF at your institution? Please refrain from providing identifiable information about yourself or others as part of this response.

What is your current title?

- ☐ Instructor
- ☐ Senior instructor
- ☐ Lecturer
- ☐ Senior lecturer
- ☐ Assistant teaching professor
- ☐ Associate teaching professor
- ☐ Teaching professor
- ☐ Professor of practice
- ☐ Adjunct professor
- ☐ Clinical assistant professor
- ☐ Clinical associate professor
- ☐ Clinical professor
- ☐ Professor in residence
- ☐ other _____

Have you been promoted within the TFF?

- ☐ yes, once
- ☐ yes, twice
- ☐ no

Does your institution have a policy for promotion of TFF?

- ☐ yes
- ☐ no
- ☐ not sure

Does your institution have clear guidelines on the requirements for promotion within TFF?

- ☐ They have clear guidelines
- ☐ They have guidelines that are somewhat clear
- ☐ They have guidelines that are somewhat unclear
- ☐ They have guidelines that are unclear
- ☐ They do not have published guidelines

How did you get your current TFF position?

- ☐ It was created for me
- ☐ I applied for a posted position, but this was the only one I applied for
- ☐ I applied for many teaching track positions and chose this one
- ☐ I applied for tenure-track positions and got this instead
- ☐ other _____

What is your base annual salary? (please include a whole number without dollar signs or letters or commas)

What is the length of your appointment

- ☐ 9 month
- ☐ 12 month
- ☐ other _____

Do you typically receive summer salary? (select all that apply)

	No	Occasionally	Sometimes	Usually
yes for teaching summer classes	☐	☐	☐	☐
yes for service for the department	☐	☐	☐	☐
yes from grants	☐	☐	☐	☐
yes other	☐	☐	☐	☐

How many weeks of summary salary did you get last year? (please include a number only)

Can you receive buy out from teaching? (select all that apply)

- ☐ no
- ☐ yes for service for the department
- ☐ yes from grants
- ☐ yes to develop a new course
- ☐ yes other _____

Have you received funding to attend a national conference like ASEE? (answer all that apply)

- ☐ no
- ☐ yes if I present a paper
- ☐ yes if I advise a student group
- ☐ yes with no stipulation

Did you receive any funding from the department for scholarship? (e.g. a start up fund)

- ☐ yes (please describe) _____
- ☐ no

Do you get funding for other professional development opportunities?

- ☐ yes (please describe) _____
- ☐ no

Can you get a sabbatical at your institution?

- ☐ yes
- ☐ not sure
- ☐ no

Which of the following best describes you at this point in your career?

- ☐ Effective teacher: Teaches using accepted pedagogical theories and practices
- ☐ Scholarly teacher: Assess performance and makes improvements
- ☐ Scholar of teaching and learning: Engages in education experimentation, shares results at conferences
- ☐ Educational researcher: Conducts education research, publishes archival papers

Are you currently working on engineering education scholarship? (check all that apply)

- ☐ no
- ☐ yes, but I am not yet at the publishing stage
- ☐ yes and I present at the education division of my engineering society (e.g. ASCE, AIChE, IEEE, ASEE, ASME, IISE, etc.)
- ☐ yes and I present at ASEE
- ☐ yes and I publish in engineering education journals
- ☐ yes and I have received internal funding for scholarship
- ☐ yes and I have received external funding for scholarship
- ☐ yes and I advise undergraduate students on engineering educational scholarship
- ☐ yes and I advise graduate students on engineering educational scholarship

Are you currently working on technical engineering and/or STEM scholarship? (check all that apply)

- ☐ no
- ☐ yes and I present at an engineering society conference
- ☐ yes and I publish in engineering journals
- ☐ yes and I have received internal funding for scholarship
- ☐ yes and I have received external funding for scholarship
- ☐ yes and I advise undergraduate students on scholarship
- ☐ yes and I advise graduate students on scholarship

What is your age?

- ☐ 25 - 30
- ☐ 31 - 35
- ☐ 36 - 40
- ☐ 41 - 45
- ☐ 46 - 50
- ☐ 51 - 55
- ☐ 56 - 60
- ☐ 61 - 65
- ☐ 66 - 70
- ☐ > 70

What is your highest degree?

- ☐ BS
- ☐ MS
- ☐ PhD

Did you attend college in the US?

- ☐ Yes - undergraduate school and graduate school
- ☐ Yes - only graduate school (undergraduate school outside of the US)
- ☐ No
- ☐ other _____

Choose one or more races that you consider yourself to be

- ☐ White or Caucasian
- ☐ Black or African American
- ☐ American Indian/Native American or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ Other
- ☐ Prefer not to say

Are you of Spanish, Hispanic, or Latino origin?

- ☐ Yes
- ☐ No

What is your gender?

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Prefer to self-describe _____

How would you describe your university? (see <https://carnegieclassifications.acenet.edu/institutions/>)

- ☐ R1 (Very High Research Activity)
- ☐ R2 (High Research Activity)
- ☐ M1 (Larger programs that awarded at least 200 master's level degrees)
- ☐ M2 (Medium programs that awarded 100 - 199 master's level degrees)
- ☐ M3 (Small programs that awarded 50 - 99 master's level degrees)
- ☐ PUI (Primarily Undergraduate Institutions)
- ☐ HBCU (Historically Black College or University)

Does your university use semesters, quarters or trimesters?

- ☐ Semesters
- ☐ Quarters
- ☐ Trimesters
- ☐ other _____

Approximately how many undergraduate students does your department graduate every year? (Think about the average over the past few years.)

How many TFF are in your department?

How many full-time faculty are in your department?

Do TFF have a voice in faculty governance at your institution?

- ☐ yes
- ☐ not sure
- ☐ no