

Assessing Improvements in Self-Efficacy and Sense of Belonging through an Engineering New Faculty Orientation Teaching Workshop

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Introduction

The transition into a new faculty role looks different across academic institutions, departments, and disciplines, and new engineering faculty are commonly expected to begin teaching immediately while figuring out systems, expectations, and professional cultures. Despite assumptions that faculty arrive with formal training in teaching, including learning objectives, evidence-based teaching, and assessing student learning, most engineering faculty receive little to no pedagogical preparation before beginning their role [1]. At the same time, new faculty are expected to plan and launch research programs, identify funding sources, write grant proposals, and recruit and mentor graduate students, often immediately after starting [1].

Early faculty professional development is therefore critical in providing foundational support and direction for long-term success. Beyond developing instructional competence, early support also fosters a sense of belonging by helping new faculty connect to institutional resources, access organizational support, and build relationships with colleagues that contribute to their perceptions of being valued and accepted within the academic workplace [2]. Without these supports, faculty may feel isolated or uncertain about expectations, particularly in large, research-intensive engineering environments.

In response, many universities have implemented programs to support new faculty as they acclimate to their roles. Faculty development initiatives that include structured workshops, mentoring, and learning communities create intentional opportunities for connection, normalize common teaching challenges, and reduce isolation by positioning these challenges as shared experiences rather than individual shortcomings [3]. These initiatives are designed to help faculty quickly begin their onboarding, clarify expectations, and establish early connections with departmental and college-level resources and support networks. Despite the widespread adoption of new faculty orientation programs [4], there remains limited evidence on the impact of teaching-focused orientation on faculty teaching self-efficacy and sense of belonging.

At North Carolina State University, the College of Engineering's Office of Faculty Development and Success (Engr OFDS) implemented a four-day new faculty orientation, with the first two days dedicated to effective teaching through the New Faculty Orientation Teaching Workshop (NFOTW). This workshop provides foundational pedagogical tools while supporting faculty confidence, readiness, and sense of belonging during a critical transition. This paper examines the impact of NFOTW on new engineering faculty teaching self-efficacy and sense of belonging using pre-, post-workshop, and post-semester survey data.

Background

Faculty Self-Efficacy in College Teaching

Self-efficacy, first proposed by Bandura [5], refers to beliefs about personal capability that influence individuals' initiation of action, effort, and persistence in the face of challenges. This

concept is directly applicable to new faculty as they approach teaching responsibilities. Faculty teaching self-efficacy refers specifically to instructors' beliefs in their ability to facilitate the development of students' knowledge, abilities, and values [6]. These beliefs are task-specific and distinct from general confidence or attitudes toward teaching, reflecting instructors' perceived ability to enact effective instructional practices in their own classrooms [7]. According to Bandura's social cognitive theory, self-efficacy is informed by four primary sources that provide individuals with information about their perceived capabilities: (1) mastery experiences, (2) vicarious experiences, (3) social or verbal persuasion, and (4) physiological and affective states. Among these sources, mastery experiences exert the strongest influence on self-efficacy [8].

Higher teaching self-efficacy has been associated with greater instructional planning and organization, increased openness to instructional innovation, and a stronger commitment to teaching [8]. These behaviors support the development of mastery experiences that further reinforce self-efficacy. In the absence of structured support, early teaching experiences may reinforce doubts about instructional ability rather than build confidence [3]. Prior research has also established teaching self-efficacy as a meaningful indicator of both instructional quality and faculty well-being. Ismayilova and Klassen [9] found that higher levels of teaching self-efficacy among university faculty were associated with greater engagement in instructional decision-making, higher job satisfaction, and lower stress, suggesting that teaching self-efficacy functions as both a driver of effective instructional practice and a psychological resource that supports resilience and sustained engagement in teaching roles.

Faculty Sense of Belonging

When expectations and teaching practices are not made explicit, new faculty often feel isolated, which ultimately increases uncertainty and delays their adjustment to academic life [1]. Research on faculty belonging indicates that early academic experiences are impacted by access to mentorship and connections at their institution, with weaker support associated with reduced well-being, lower job satisfaction, disengagement, and increased risk of attrition during the transition into academia [2]. Importantly, faculty's sense of connection can be influenced by institutional practices, leadership behaviors, and departmental climates that show the importance of having structured professional opportunities to support engagement between new faculty and personnel at the institution [2].

New Faculty Orientation as Faculty Development

New faculty orientation is a nearly universal feature of research-intensive universities, yet it is often structured as a short, event-based experience that emphasizes institutional information rather than faculty learning or development [4]. While orientation may help faculty adjust administratively, it is not designed to prepare them for the full scope of faculty roles, particularly teaching and academic expectations [4]. Interactive workshops that address teaching, research, and professional integration allow new faculty to adopt effective practices earlier in their careers, reducing reliance on prolonged trial and error learning [3]. Formal mentorship and extended instructional development programs further support confidence, retention, and teaching self-efficacy, reinforcing the limitations of one-time orientation models [10]. Collectively, this work suggests that effective new faculty orientation should be understood not as a single event, but as

a front-loaded entry point into a larger faculty development ecosystem that integrates teaching support, mentoring, and collegial connection over time [4].

Methods

Research Purpose and Questions

The purpose of this study was to examine how participation in the two-day NFOTW influences new engineering faculty members' teaching self-efficacy and sense of belonging as they begin their roles at a university. The workshop was intentionally designed to provide foundational tools for course design, assessment, classroom instruction, and early professional integration, while also introducing participants to the College of Engineering's teaching culture and expectations. These elements were intended to support continued instructional development and engagement beyond the orientation period.

This study investigated whether participation in NFOTW contributed to changes in new faculty members' teaching self-efficacy and sense of belonging within the college context. Teaching self-efficacy reflects faculty members' confidence in their ability to carry out core teaching tasks, while sense of belonging reflects perceptions of connection and support within the academic environment. Both constructs are particularly salient during the early career period, when faculty are simultaneously developing instructional practices and professional relationships.

This study addressed the following research questions:

1. How does participation in the two-day NFOTW influence new faculty members' teaching self-efficacy?
2. How does participation in the two-day NFOTW influence new faculty members' sense of belonging within the College of Engineering and the institution?
3. How do the topics in NFOTW align with early-career faculty needs for teaching and belonging?

The intention is that with the targeted teaching content, applied learning activities, and structured opportunities for peer interaction embedded within NFOTW, the experience would contribute to increases in both teaching self-efficacy and sense of belonging, positioning the workshop as a front-loaded entry point into ongoing faculty development within the college.

Participants

Survey participants were newly hired faculty members within a College of Engineering that includes core engineering departments as well as departments jointly affiliated with other colleges. The departments include biomedical engineering, chemical and biomolecular engineering, civil, construction, and environmental engineering, computer science, electrical and computer engineering, industrial and systems engineering, materials science and engineering, mechanical and aerospace engineering, nuclear engineering, biological and agricultural engineering, forest biomaterials, and textile engineering, chemistry, and science.

There were 12 attendees at NFOTW in August 2025. Of these, 11 participants completed the pre-workshop survey, 10 completed the post-workshop survey, and 8 completed the post-semester survey. One pre-workshop survey response was removed from the analysis due to an incomplete response. Faculty members have different prior teaching backgrounds. Participants reported a

variety of prior experiences as graduate teaching assistants, mentored co-instructors, lecturers during postdoctoral appointments, prior faculty appointments, and no formal teaching experience. Most participants were tenure-track faculty, with a smaller number of professional-track teaching faculty. Participation in the surveys was voluntary and independent of workshop completion.

Program Description

NFOTW was first developed and introduced by the founding Associate Dean for Faculty Advancement and director of Engr OFDS (previously Engineering Faculty Advancement), Christine Grant, in collaboration with Richard Felder, a nationally recognized engineering education expert, and a group of contributors with expertise in engineering education and faculty development. The two-day NFOTW workshop serves as the teaching-focused component of a four-day, cohort-based new faculty orientation. The final two days cover research, mentoring, and institutional expectations, but this study focuses on outcomes from the teaching sessions. The program was designed to support early-career engineering faculty during their transition into academic roles at our institution. This focus aligns with prior research indicating that early-career faculty must navigate unclear expectations, establish legitimacy, and seek support networks as they transition into faculty roles [11]. This study focuses specifically on the first two days of the program, which are intentionally dedicated to teaching-focused faculty development.

Table 1 includes the topics covered across both days. The workshop topics were informed by prior iterations of the NFOTW and refined through input from experienced mid-career teaching faculty who served as lead facilitators. These topics also reflect well-documented areas of need for new faculty, including course design, assessment, and balancing teaching and research responsibilities [1]. The sessions are led by engineering faculty with established instructional leadership roles as Directors of Undergraduate Programs across two departments, providing both disciplinary context and multiple instructional perspectives. Participants engage in a combination of short interactive presentations, structured discussions, and applied work time to develop elements of their own courses, such as learning outcomes, assessments, and syllabi. Sessions are intentionally designed to model effective teaching practices by incorporating active learning, allowing participants to experience these strategies while creating similar activities to integrate into their own courses. The facilitators bring substantial instructional experience and institutional knowledge, with the ability to identify the topics most critical to early-career faculty success. Their perspectives were a significant asset, as they were able to select topics that were practical, relevant, and responsive to common challenges new faculty face.

Each day also included a breakout session designed to address high-need or complex teaching topics. On Day 1, breakout sessions focused on assessment practices and evaluation strategies. On Day 2, all participants engaged in an introductory session on artificial intelligence in engineering education, followed by breakout sessions that allowed faculty to explore AI applications in teaching or research in greater depth. Topics with an asterisk are led by campus experts.

Table 1. NFOTW Agenda for Days 1 and 2

Day 1: Introductions and Class Management	Day 2: Effective Teaching and Advising
• Effective Course Design • Aligning Learning Outcomes and Assessment • Getting Started with the LMS • Planning and Preparing for the Semester: Schedules • <i>Breakout Session 1</i> - Assessment in Action: Moodle and Gradescope* • <i>Breakout Session 2</i> - Developing Evaluation and Assessment Plans* • Planning/Preparing for the Semester: Syllabus & Course Policies	• Lecturing and Active Learning • Starting Strong in the First Week • Teaching Evaluations • AI Essentials for Engineering* • <i>Breakout Session 1</i> - AI in Action - AI in Teaching* • <i>Breakout Session 2</i> - AI in Research* • Dealing with Difficult Student Situations

Data Collection

This study used a three-part survey design to see how participation in the new faculty orientation influenced new faculty members' teaching self-efficacy and sense of belonging across their first semester. Surveys were administered at three strategically selected timepoints: (1) pre-workshop, prior to the orientation, to capture baseline perceptions before the orientation; (2) post-workshop, immediately following the teaching orientation portion of the workshop, to capture workshop impact on participant perceptions; and (3) post-semester, distributed in December after the fall semester concluded to capture impact of the first semester on participant perceptions. This design allowed for examination of immediate changes associated with the workshop as well as “stickier” shifts that occurred after sustained teaching and institutional experience.

The survey instrument was intentionally developed to examine new faculty members' teaching self-efficacy and sense of belonging, using items from the College Teaching Self-Efficacy Scale (CTSE) [7] and the Departmental Sense of Belonging and Involvement (DeSBI) scale [12]. Teaching self-efficacy items were adapted from the CTSE, which assesses instructors' confidence in performing specific teaching tasks across core domains of college teaching, including course planning, instructional delivery, classroom management, assessment, and feedback. As Bandura's [5] described self-efficacy, these items focused on perceived capability rather than agreement and retained a task-specific orientation.

In the present study, CTSE-aligned items were adapted to a 5-point Likert confidence scale to align with other NFOTW evaluation instruments, rather than the 100-point scale used within the original study [7]. Sense of belonging items were adapted from the DeSBI scale [12] and modified to reflect faculty roles, professional relationships, and departmental and college contexts. These items were designed to capture belonging as a multidimensional construct, including interpersonal belonging, institutional support and navigation, and engagement and recognition within the institution's engineering college. Together, the CTSE and DeSBI modified items were designed to capture both instructional confidence and perceptions of connection and support.

The three surveys were designed to capture baseline perceptions, immediate workshop-related changes, and post-semester impacts of both teaching self-efficacy and sense of belonging. This timing supports interpreting NFOTW as an early intervention that supports new faculty development by building essential teaching skills and providing practical tools for success, while also encouraging continued improvement in teaching and fostering a sense of belonging within the institution. These metrics were used to examine program effectiveness by aligning NFOTW topics with the scales. The survey instruments for the pre-workshop, post-workshop, and post-semester are provided in Appendix A.

Data Analysis

Data analysis consisted of descriptive statistics to support assessment and program evaluation of the teaching-focused portion of NFOTW. Means were calculated based on available responses at each time point. The changes in the mean values of teaching self-efficacy and sense of belonging were examined across three survey timepoints. For each survey item aligned with Research Questions 1 and 2, mean scores were calculated for the pre-workshop, post-workshop, and post-semester surveys. Given the small sample size of the study, descriptive analysis was determined to be the most appropriate analytical approach, and inferential statistical comparisons were not conducted [13]. The comparisons focused on changes in mean scores over time, which were used to inform understanding of how faculty perceptions shifted across the orientation and first semester.

Descriptive analysis was conducted on background, multiple-choice, and selecting all that apply survey items included in the pre-workshop, post-workshop, and post-semester surveys. For items in which participants selected their top three priorities, frequencies were calculated based on the total number of faculty selecting each option, and percentages were computed relative to the number of respondents at each time point. These summaries were used to document prior teaching experience, course preparation context, access to instructional materials, and reported areas of need or concern. Findings related to Research Question 3 were interpreted by descriptively aligning faculty-reported needs and priorities with the topics emphasized within the teaching-focused portion of the workshop. The analysis did not examine differences across social-demographic variables, such as prior teaching experience, faculty role, or disciplinary background, which may influence variation in self-efficacy and belonging outcomes.

Results

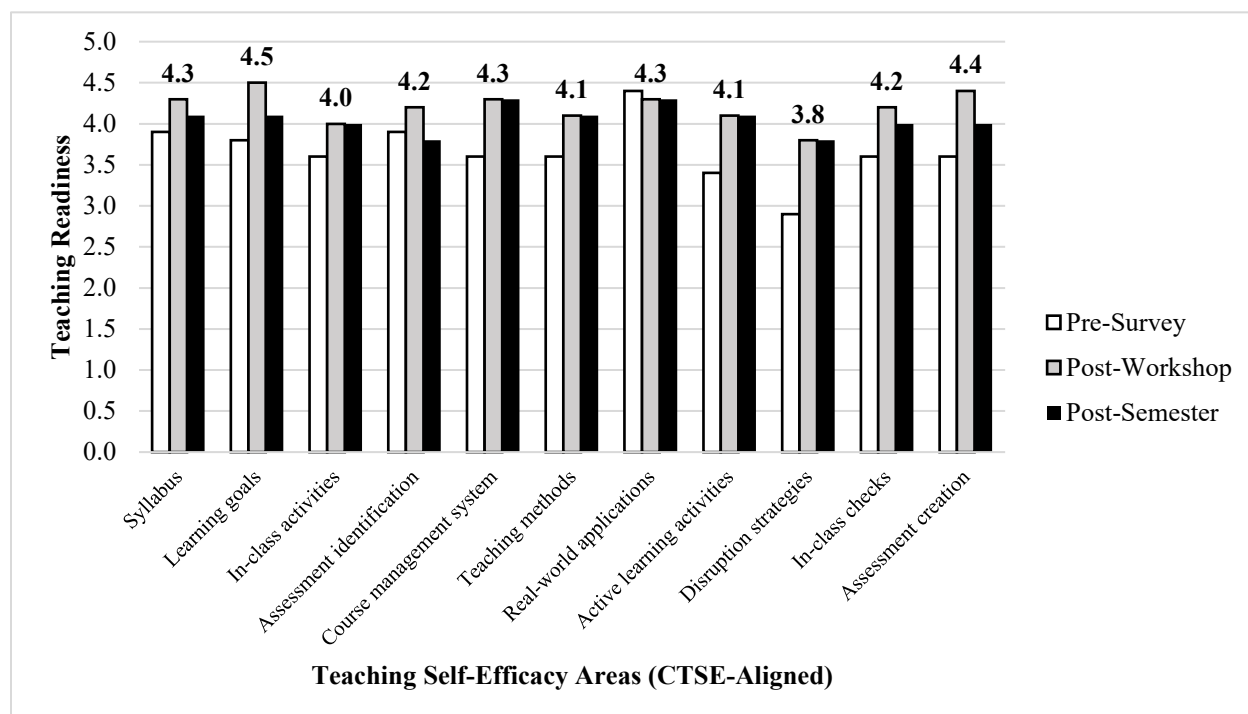
Overall, results indicate that participation in NFOTW was associated with increased teaching self-efficacy and sense of belonging among new engineering faculty. Twelve faculty participated in the teaching-focused portion of the new faculty orientation. Survey response rates included 11 pre-workshop responses, ten immediate post-workshop responses, and eight post-semester responses. Results are presented below by research questions.

RQ 1: Influence of NFOTW on Faculty Teaching Self-Efficacy

Teaching self-efficacy results are summarized in Figure 1, with post-workshop values displayed at the top of the bars for each inventory item. A five-point Likert scale was used, with five indicating “extremely confident” and 1 indicating “not at all confident.” Mean scores increased

from pre-workshop to immediate post-workshop across almost all measured instructional tasks. One item, relating course material to real-world applications, began at a relatively high pre-workshop mean value and remained stable with slight decreases over time. From the pre-workshop to the immediate post-workshop surveys, mean scores increased for minimizing disruption strategies (+0.89), creating assessments aligned with learning goals (+0.85), developing appropriate learning goals (+0.68), designing active-learning activities (+0.74), and using course management systems to organize content (+0.66). Additional increases were observed for identifying in-class activities aligned with learning goals (+0.45), using in-class checks for understanding (+0.56), and developing a syllabus (+0.39).

Figure 1. Teaching Readiness Influenced Through NFOTW



From the immediate post-workshop to the post-semester survey, mean values decreased, with post-semester scores generally remaining within approximately 0.4 points of pre-workshop levels. These changes should be interpreted within the context of the 5-point scale and faculty members' first semester of teaching. While scores declined from post-workshop to post-semester, post-semester scores remained higher than pre-workshop levels in most areas, with exceptions including identifying assessments that measure student learning and relating course materials to real-world applications.

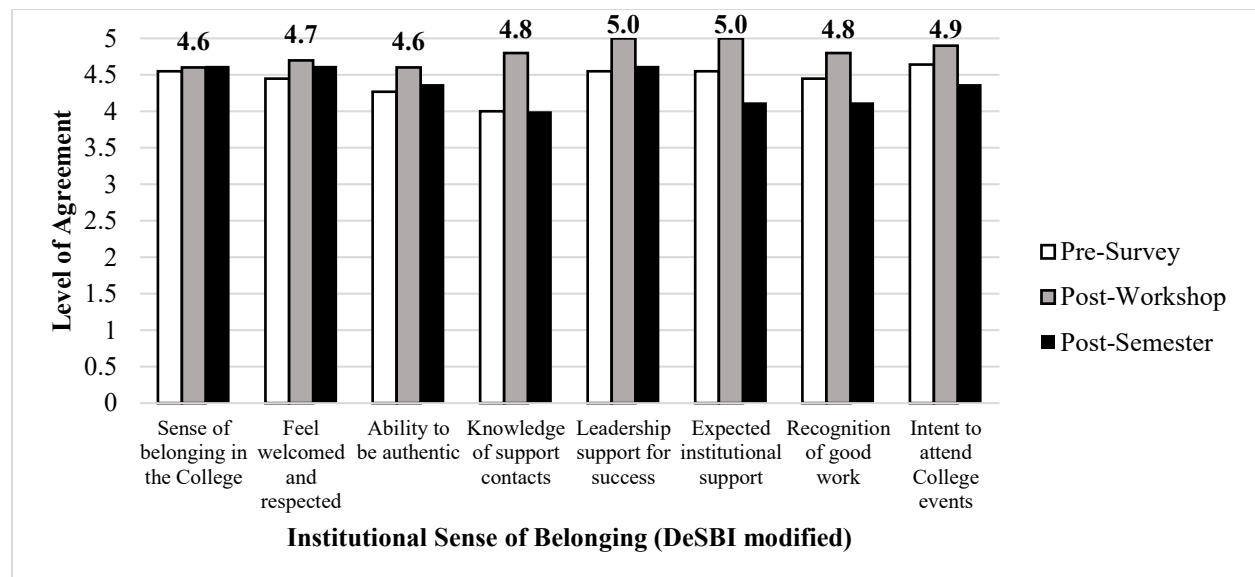
RQ 2: Influence of NFOTW on Faculty Sense of Belonging

Sense of belonging was measured using modified items from the DeSBI scale on a five-point Likert scale with 5 being "strongly agree" and 1 being "strongly disagree" and the results are summarized in Figure 2. From the pre-workshop to the post-workshop surveys, mean scores increased across all sense of belonging items, including sense of belonging in the College of

Engineering (+0.05), feeling welcomed and respected (+0.25), ability to be one's authentic self (+0.33), knowing who to contact for help (+0.80), perceptions that leadership wanted participants to succeed (+0.45), expectations of institutional support in one's work (+0.45), perceptions that good work would be recognized (+0.35), and plans to attend college-sponsored events (+0.26).

By the post-semester survey, mean scores declined slightly from post-workshop levels on most items and showed variation relative to pre-workshop values. The knowledge of support contacts returned to its pre-workshop level, while expectations of institutional support and recognition of good work decreased below pre-workshop means and remained below immediate post-workshop levels. Overall, these patterns suggest that NFOTW was associated with early increases in sense of belonging immediately following the workshop.

Figure 2. Influence of NFOTW on Faculty Sense of Belonging



RQ 3: Alignment Between Faculty Needs and Workshop Topic Selection

Participants were asked to select up to three aspects of their work in which they desired additional support related to teaching, research, and professional adjustment at three time points. Key patterns are summarized below:

- Research productivity was the most frequently selected aspect for support across all survey administrations (73% pre-workshop, 80% post-workshop, 63% post-semester).
- Teaching-related needs showed more change over time.
- Designing and planning courses remained a common focus and increased by the post-semester survey (55% pre-workshop, 50% post-workshop, 75% post-semester).
- Classroom management and building relationships with students were selected less frequently by the end of the semester.
- Instructional technology showed a modest increase in interest over time (9% pre-workshop to 25% post-semester).

- Work-life balance was a persistent concern, increasing from 36% pre-workshop to 50% post-semester.

Overall, these patterns indicate that faculty support needs change across the first semester, with early instructional concerns giving way to longer-term teaching refinement, research productivity, and work-life balance considerations.

Table 2. Distribution of Top Three Priorities Selected by Survey Participants (%)

Statement	Pre-Workshop N=11	Post-Workshop N=10	Post-Semester N=8
Designing and planning my course(s)	55%	50%	75%
Grading and assessment	18%	10%	13%
Classroom management	27%	20%	13%
Building relationships with students	55%	60%	13%
Using technology (e.g., Moodle, Zoom)	9%	20%	25%
Understanding departmental or college expectations	9%	10%	13%
Research productivity	73%	80%	63%
Work-life balance	36%	40%	50%

In the pre-survey, when asked what would support course preparation, example syllabi were selected by eight faculty, tips or advice from experienced faculty by seven, sample assessments and grading rubrics each by six, example slides or lecture notes by five, and access to prior learning management system content by five. Prior to the workshop, designing and planning courses and building relationships with students were each identified as top priorities by six faculty. Classroom management was selected by three faculty, grading and assessment by two faculty, and use of instructional technology by one faculty. Following the workshop, faculty most frequently reported increased preparedness to engage students in active learning by seven faculty, identify teaching resources and support contacts by six faculty, understand College expectations by six faculty, consider student needs in teaching by five faculty, navigate instructional platforms by four faculty, and build community within and outside their department by four faculty.

Overall, results related to the third research question indicate strong alignment between NFOTW programming and new faculty needs. Faculty-reported preparedness to continue teaching increased from a pre-workshop survey mean of 3.82 to 4.30 post-workshop and 4.60 by the end of the semester. This alignment is further illustrated by one participant's reflection:

“Although I felt overwhelmed during the workshop with the sheer amount of information covered, all of it was relevant and valuable for my first week of teaching. Without this workshop, I do not think I would have made it through the first week without significant deterioration to my mental health. Overall, this was the best prep I had for being a faculty member since I decided to pursue a career in academia.”

Discussion

Implications of NFOTW on Teaching Self-Efficacy

The patterns shown in Figure 1 align with how college teaching self-efficacy is defined and operationalized in the CTSE Scale study [12] as task-specific confidence across instructional planning, instructional delivery, classroom management, and assessment. In this study, the largest pre- to post-workshop gains occurred in areas that align directly with these topic areas and were explicitly addressed during the Day 1 and Day 2 workshop sessions.

The largest increase was observed in classroom management, with confidence in minimizing classroom disruptions increasing from 2.91 to 3.80 (+0.89). Assessment and alignment also showed substantial gains, particularly for creating assessments aligned with learning goals, which increased from 3.55 to 4.40 (+0.85). Instructional planning increased for developing appropriate learning goals, rising from 3.82 to 4.50 (+0.68), while instructional delivery increased for designing active-learning activities, which increased from 3.36 to 4.10 (+0.74). These changes reflect the CTSE emphasis on measuring confidence in concrete teaching tasks and support the use of item-level results to examine how targeted professional development experiences contribute to changes in teaching self-efficacy.

From the immediate post-workshop survey to the post-semester follow-up, several self-efficacy items decreased slightly while remaining above pre-workshop levels. This pattern is consistent with findings from studies of university faculty development, in which initial gains following structured professional development evolve as instructors gain sustained classroom experience. Brent and Felder [4] describe how front-loaded preparation and structured guidance for new engineering faculty support early instructional competence. Similarly, studies of new faculty orientation and early faculty development in engineering and related STEM fields indicate that structured, front-loaded training supports instructional preparedness and effective teaching during the first semester, while recognizing that teaching confidence and instructional judgment continue to develop as faculty gain sustained classroom experience and integrate feedback from practice [15, 16].

Implications of NFOTW on Sense of Belonging

Several of the largest immediate gains occurred in items that map closely onto the DeSBI valued competence and institutional support space, including knowing who to contact for help, moving from 4.0 to 4.8, and perceptions that leadership wants me to succeed, moving from 4.55 to 5.00, and expectations of support, moving from 4.55 to 5.0. These align with the idea that belonging is shaped by clear access points and by feeling noticed, supported, and valued by the unit. The post-semester decreases on several items, including knowing who to contact for help, moving from 4.80 to 4.00, and expecting support in my work, moving from 5.0 to 4.13, point to a common onboarding reality. Orientation can raise awareness and optimism, while the first semester tests how consistently support structures are experienced in practice. Because the DeSBI separates belonging from involvement, the observed drop in plans to attend college events, moving from 4.90 to 4.38, is also interpretable as a shift in involvement rather than a direct loss of belonging, especially during a high-demand first semester.

Alignment Between Faculty Needs and Workshop Topic Selection

The priority data show strong alignment between what faculty identified as most pressing and what NFOTW emphasized. In the pre-workshop survey, the highest priorities were research productivity at 72.7% and designing and planning coursework at 54.6%, followed by building relationships with students at 54.6% and work-life balance at 36.4%. Post workshop, building relationships with students remained high at 60.0% and course planning remained a top priority at 50.0%, while technology increased from 9.1% pre-workshop to 20% post-workshop, matching the agenda focus on the LMS, Moodle, Gradescope, and course setup.

By post-semester, course planning returned as a top priority at 75.0%, and technology continued to rise to 25.0%, which is consistent with the lived reality of managing course infrastructure over time. At the same time, the agenda is teaching-heavy by design, but research productivity remained as high priority across all timepoints, 72.7% pre, 80% post workshop, and 62.5% post semester. This highlights a deliberate boundary and a practical implication. The workshop successfully targeted high-leverage teaching topics that map to the largest CTSE gains, course design, outcomes and assessment alignment, active learning, and managing difficult student situations, while faculty priorities reflect that research and workload pressures remain present and may influence the post-semester adjustment in both self-efficacy and belonging.

Limitations and Future Directions

There were several limitations noted from this evaluation. First, the number of participants was small, which limits how we can generalize this data and limits the type of analysis that can be conducted. There are typically around 30-40 new faculty, but given certain constraints, there was a small cohort of newly hired faculty during this iteration of NFOTW. Second, the study relied primarily on self-reported survey data and did not include qualitative measures, such as interviews or open-ended reflections, that could provide deeper insight into how faculty experienced the workshop or which specific elements were most impactful. As a result, the findings describe observed changes but cannot fully explain the specific factors that impacted those changes. Additionally, while the study identified needs and contextual factors related to faculty readiness, the available data limit the ability to assess broader contextual influences, such as the department climate, mentoring relationships, or workload differences across faculty roles.

Future research should incorporate qualitative methods and larger samples to more fully capture the complexity of early-career faculty transitions and to better understand how institutional context shapes teaching confidence and belonging over time. Despite these limitations, the findings provide initial evidence that teaching-focused new faculty orientations can meaningfully support early-career faculty during a pivotal stage in their professional development. The study did not examine differences across social-demographic variables (e.g., rank, prior teaching experience, or discipline), which may influence observed outcomes.

Conclusion

This evaluation examined the influence of NFOTW on new engineering faculty members' teaching self-efficacy and sense of belonging. Findings indicate that intentional, front-loaded teaching development can support faculty confidence in core instructional tasks while also strengthening perceptions of connection and institutional support during the transition into academic roles. The results suggest that teaching-focused orientation experiences are most effective when they move beyond information delivery to provide applied instructional guidance and opportunities for connection. While the small sample size and reliance on self-reported data

limit generalizability, this work contributes evidence that teaching-focused new faculty orientation can serve as a meaningful entry point into a larger faculty development ecosystem. Future work should build on these findings through larger samples and qualitative approaches to better understand how early teaching support and institutional context interact to influence faculty development trajectories over time.

Acknowledgments and Funding: This study was reviewed and approved by the Institutional Review Board at our institution under IRB #28360. This work did not receive external funding.

Generative AI: Generative AI tools were used for editorial review and to assist with identifying relevant literature. All analysis, interpretation, and conclusions are the authors' own.

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Appendix A. NFOTW Survey Instrument

Teaching self-efficacy and sense of belonging items were intentionally administered at the pre-orientation, post-workshop, and post-semester timepoints to support longitudinal comparison. Other items varied by survey administration to align with participants' instructional experience and the study's research questions.

A. Teaching Self-Efficacy Items

Adapted from the College Teaching Self-Efficacy Scale

Survey administration: Pre-Orientation, Post-Workshop, Post-Semester

Response scale: Extremely confident, Very confident, Moderately confident, Slightly confident, Not at all confident

Participants rated their confidence in their ability to:

1. Develop a syllabus that describes all the essential course information
2. Develop appropriate learning goals
3. Identify in-class activities that align with learning goals
4. Identify assessments that measure student learning
5. Use a course management system to organize content
6. Use a variety of teaching methods
7. Relate course material to real-world applications
8. Design active learning activities
9. Use strategies to minimize disruptions
10. Use in-class checks for understanding
11. Create assessments based on learning goals

B. Sense of Belonging Items

Adapted from the Departmental Sense of Belonging and Involvement Scale

Survey administration: Pre-Orientation, Post-Workshop, Post-Semester

Response scale: Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree

Participants rated their agreement with the following statements:

1. I feel a sense of belonging in the College of Engineering
2. I feel welcomed and respected by others in the College of Engineering
3. I feel I can be my authentic self in the College of Engineering
4. I know who to contact in the College of Engineering if I need help or advice
5. I believe the College of Engineering leadership wants me to succeed
6. I expect to be supported by the College of Engineering in my teaching, research, and or service
7. I believe people in the College of Engineering will recognize when I do good work
8. I plan to attend College-sponsored seminars, workshops, or events

C. Teaching Preparedness Item

Survey administration: Pre-Orientation, Post-Workshop, Post-Semester

Response scale: Very prepared, Somewhat prepared, Neutral, Slightly unprepared, Not at all prepared

1. At this point in time, how prepared do you feel to teach your assigned course or courses at North Carolina State University

D. Impact of NFOTW

The following items were intentionally administered only after participants had completed the teaching-focused workshop or had sufficient teaching experience.

Survey administration: Pre-Orientation, Post-Workshop, Post-Semester

Response format: Select all that apply

1. Begin designing my fall course or courses
2. Identify where to go for teaching resources or support
3. Understand the expectations of College of Engineering faculty
4. Engage students in active learning strategies
5. Consider student needs in my teaching
6. Build community within and outside my department
7. Integrate Entrepreneurial Mindset Learning if desired
8. Navigate instructional platforms such as Moodle or Zoom

E. Open-Ended Question (Post-Workshop and Post-Semester Only)

1. Is there anything else you would like the orientation facilitators or college leadership to know about your experience during your first semester so far?