

WORK-IN-PROGRESS | The cross-disciplinary endowed professorship in engineering: Student perceptions of communication and teamwork workshops

Dr. Luke LeFebvre, University of Kentucky

Luke LeFebvre holds a PhD in Communication and fulfills the H. Lester Reynolds Endowed Professorship role for the Pigman College of Engineering at the University of Kentucky. He has taught communication studies courses for more than 20 years. Dr. LeFebvre has collaborated as a co-principal investigator on both NSF- and IMLS-funded multidisciplinary projects with educational foci. He is an active member of the International Communication Association (ICA), National Communication Association (NCA), and the American Society for Engineering Education (ASEE) and has published numerous conference papers and journal articles on message creation and message processing.

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The Cross-Disciplinary Endowed Professorship in Engineering: Student Perceptions of Communication and Teamwork Workshops

1. Introduction

In 1721 Harvard College created the first endowed professorship within higher education [1]. Since that time, titled professorships across U.S. higher education institutions have increased exponentially [2]. However, the extant literature has not comprehensively explored the impact titled professorships have in fulfilling those roles for institutions. This paper begins to fill that gap by exploring an endowed professorship in a College of Engineering at a public, land-grant research university.

The goal of this paper is to make transparent efforts that have been undertaken through the endowed professorship in service to a College of Engineering to meet their ABET requirements for communication and teamwork. Specifically, this work-in-progress paper is structured as follows: Section 2 covers background information related to a titled professorship and the workshops associated with the specific endowed professorship outlined in this paper. In Section 3, the workshops developed are described. Results of the impact of these workshops are then shared in Section 4. Finally, Section 5 concludes with a discussion and offers future directions.

2. Titled Professorships

A titled or “named” professorship is a formal academic title appointment by an institution’s governing board that ordinarily resides outside the tenure ranks of assistant, associate, and full professor [3]. Such roles typically can be funded through an endowed gift, allocating unrestricted endowment funds, or allocation of an institution’s general funds in support of the professorship [4]. Whatever the funding source, a “named” professorship is typically an endowed chair or professorship named after the benefactor or otherwise named by the benefactor or institution in honor of an individual, family, or organization [5]. Duties associated with a titled professorship can vary but are usually clarified in the term and duties section of the professorship agreement [6]. Some titled professorships have been created to promote cross-disciplinary research to facilitate crosspollination of expertise from diverse disciplines to develop new approaches to address complex challenges [7]. Such formalized and funded collaborations are especially important because few engineering faculty are trained in education traditions; therefore, engineering education research and instructional support rely heavily on collaboration between engineers and social scientists [8].

The endowed professorship in the College of Engineering (CoE)—explored in this paper—provides a complex challenge for a faculty member working across disciplines. Duties associated with the endowed professorship are to provide support for faculty in the CoE to enhance the communication and teamwork skills of engineering undergraduate and graduate students [9]. Specific activities include: (a) guide the CoE to meet ABET requirements for communication and teamwork, (b) work with the CoE’s Undergraduate Education Team, (c) assist individual departments with matters of communication and teamwork, (d) participate in the introduction of communication and teamwork across introductory engineering courses, and (e) assess the quality

and efficacy communication components related to engineering curricula. In order to work to meet these specific activities, as the current holder of the endowed professorship, I developed a series of workshops that CoE faculty could select to integrate into their engineering courses.

3. Workshop Development

Workshops for students primarily focus on promoting educational improvement [10]. Hence, workshop characteristics and design need to include relevant knowledge and skills as well as allow for flexibility to meet the needs of the learners partaking in the training. Effective workshops incorporate high quality participant interaction and active learning to simultaneously promote personal growth and professional development for degree completion.

When working cross disciplinarily it is important to employ an ethnographic mindset that seeks first to understand a given context before collaboratively integrating solutions [11]. My previous role at another R1 institution allowed me to work with STEM faculty to improve oral and visual communication skills [12]. These collaborations resulted in me being invited to partner on sponsored projects [13] and then attend ASEE conferences [14, 15, 16]. These experiences culminated in my creation of these signature workshops for the CoE (Table 1).

Table 1. Endowed Professorship Signature Workshops

<i>Title</i>	<i>Description</i>	<i>Signature Workshop Learning Outcomes</i>	<i>ABET Outcome</i>
Poster Presentation Design	Develop impactful posters that communicate to an audience with or without you being present. Learn how to incorporate a powerful visual layout and increase audience view time of your research.	- Recognize layout segmentation, text choice, and space utilization as visual communication options that influence poster messages for an audience. - Enact visual communication poster design that enacts effective communication goals and audience message creation.	<i>Communication:</i> An ability to communicate effectively with a range of audiences.
Advanced PowerPoint	Transform your slide decks into an immersive presentation with a cinematic feel. Learn high-end industry standard slide design concepts that are guaranteed to leave a positive impression with any audience.	- Differentiate slide categories and foundational slide design principles for effective visual communication. - Perform slide design concepts that align with competent communicative choices that are audience centric and illustrate slideware technology self-efficacy.	
Team Conflict Management	Employ various conflict response options to manage different conflictual situations. Learn your conflict response preferences and strategies for making decisions to respond to situations where the concerns of two or more people appear to differ.	- Demonstrate the ability to be self-aware of your conflict response preferences and how those preferences impact team members. - Recognize similarities and differences between conflict responses and how they affect communication in a team.	<i>Teamwork:</i> An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
Team Leadership	Reframe your understanding about complex tasks that require individuals to work as a team. Learn the essential behaviors high performance teams frequently engage in to accomplish collective tasks and increase team performance.	- Identify contexts, situations and barriers that enhance the level of task dependency leading to teamwork. - Evaluate team characteristics for strengths and weaknesses of collective team leadership to enhance team productivity and outcomes.	

The CoE Associate Dean for Undergraduate Education and Student Success, after sharing the signature workshops, replied, “Really nice job on these, btw. Those topics are very much on target and also cover a broad range. It’s nice that they hit both undergraduate and graduate students” [17].

4. Signature Workshop Impact

Recruitment of workshop participants (i.e., CoE students) involved a multi-pronged approach using email correspondence to CoE undergraduate education directors for each department ($n = 13$), face-to-face meetings with the CoE associate dean for undergraduate education, and a presentation to the CoE undergraduate education committee about each of the signature workshops. An essential component when using workshops in new and different contexts for cross-disciplinary audiences is to assess participant perceptions of workshop effectiveness and share those results with engineering faculty members [18].

All participants ($N = 703$) were collegiate engineering students enrolled in the CoE at a large east central university in the United States. Student classification consisted of 14.0% freshmen, 9.6% sophomores, 16.4% juniors, 58.9% seniors, and 1.1% graduate. Participant sex was 21.6% female and 78.4% male. Participants identified ethnicity was: 77.2% Caucasian, 3.7% African American/Black, 3.0% Biracial, 4.8% Latino/Latina/Latinx, 4.0% Asian American/Pacific Islander, 0.2% American Indian/Alaskan Native, 3.3% Nonresident Alien, and 3.8% Unidentified.

Table 2. Signature Workshops Facilitated and Participant Feedback, Academic Year 2025-26

<i>Workshop</i>	<i>n</i>	<i>Response Rate</i>	<i>Pre-Workshop</i>	<i>Post-Workshop</i>	<i>Communication / Teamwork Skills</i>	<i>Student Commentary</i>
Poster Presentation Design	186	93.0%	2.97	4.43	4.55	“Information about poster best practices, like font size and organizational methods. Like the tipped over Z-pattern.”
Advanced PowerPoint	183	83.6%	2.71	4.22	4.79	“It was informative to learn of all the capabilities PPT has, and to also see how lack luster my PPTs have been. Learning that these tools on PPT even existed is such a game-changer.”
Team Conflict Management	252	100%	2.85	4.53	4.47	“Learning our conflict styles, but also the graph. I am a very visual and it was good to see them graphed out and how my strongest styles are related to each other. It was really, really great!”
Team Leadership	82	93.9%	3.51	4.53	4.30	“Seeing the difference between groups and teams. I never thought of it like it was presented and it helped me gain understanding on the matter.”

* All scores based upon a 5.0 scale.

A total of 26 signature workshops (see Table 2) were facilitated with the following CoE departments or associated programs: Aerospace Engineering (9.7%), Biosystems Engineering (6.7%), Chemical Engineering (28.3%), Civil Engineering (25.5%), Engineering Technology

(5.5%), Materials Science Engineering (3.1%), Engineering Student Organizations (7.1%), and Scholars in Engineering and Management (SEAM) Honors College (14.1%).

Participants completed a post-workshop survey to assess the quality of their workshop experience. A question contained in the survey asked students: “Prior to this workshop how familiar were you with the material presented?” The subsequent question asked: “After this workshop how familiar are you with the material presented?” Students ranked themselves on a five-point scale with 5 “Very Familiar” to 1 “Unfamiliar.” Additionally, participants responded to the following statement, “As a result of attending this program, I gained new knowledge about communication / teamwork skills.” Students ranked themselves on a five-point scale with 5 “Strongly Agree” to 1 “Strongly Disagree.” Participant averages are reported in Table 2 for the columns associated with Pre-Workshop, Post-Workshop, and Communication / Teamwork Skills. The response rate percentages vary, depending on participant survey completion post-workshop.

5. Discussion

Workshop trainings from the initial academic year show promise for increasing participant communication and teamwork knowledge and skills. Perceptions shared by students overwhelmingly indicate positive attitudes and report gaining increased familiarity and knowledge from the trainings. For instance, the executive outreach chairperson for the student council shared, “I heard from a number of students and all the members on ESC that your presentation and material was fantastic!” Engineering faculty perceptions have been equally as promising. For example, a professor of chemical engineering shared after the team conflict management workshop, “Thank you for the engaging and informative workshop yesterday. The students were still talking about what they had learned while we were in lab that afternoon. I appreciate your time and expertise.” Another civil engineering faculty member emailed following the advanced PowerPoint workshop, “Thank you, Luke! Like last semester, the students were super impressed with the possibilities within PowerPoint. It’s wonderful for you to share your expertise with them.” Next steps are to move beyond perceptions of student and faculty positive attitudes about the workshops to behavioral outcomes related to knowledge, skills, and behaviors for communication competencies and teamwork functionality.

For the communication workshops, tracking impact could explore the visual communication showcased in student PowerPoint slide decks or comparisons between posters developed by students who experienced workshop training versus (previous) students who did not. Teamwork skills could be explored via instruments [19, 20] included in the workshop trainings and then again at the conclusion of the semester. Such approaches could explore how the workshop served as an interventive treatment for team member behavior modifications and/or tracking the potential improvement of teamwork to meet course objectives. Long-term goals could follow-up with alumni and graduates to see how workshop knowledge and skills translated to employment opportunities or how those skills were incorporated into the workplace.

As identified in the duties of the endowment, integration of the workshops early in the educational experience of undergraduates is vital. For seniors in their last semester, it seems a missed opportunity for students who could have used these skills as they progress toward degree completion. For engineering faculty, these workshops could proactively help to alleviate

mediating team conflict of “essential” skills they expected students to already have for their course. Finally, these workshops could be an assessment marker to assist with ABET certification processes [21]. Coordinating with departments to strategically integrate workshops into curriculum versus a piecemeal approach would be efficient and helpful for the endowed professorship. With continued success, morphing the endowed professorship into a permanent faculty position in the CoE as an instructional resource could be mutually beneficial for all parties and learners. Such a role could oversee a communication training center specializing exclusively in trainings for engineering faculty, graduate, and undergraduate students [22].

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