Lessons Learned about Empowering Engineering Instructional Faculty through a Group Coaching Model

Gemma Henderson, University of Miami

Gemma Henderson presently holds the position of Director of Learning Platforms, Academic Systems, Innovation, and Experience at the University of Miami. With a background in educational development, Gemma collaborates and consults with faculty, academic units, and other stakeholders across the University, with a focus on digital pedagogies and curriculum development. Gemma actively participates in information technologies and educational initiatives to enhance both undergraduate and graduate courses, representing Academic Technologies. Gemma currently serves as the Curriculum Development Lead in a collaborative research project, funded by the National Science Foundation, with faculty at the University of Texas El Paso, University of Miami, and Florida International University focused on undergraduate engineering education at Hispanic Serving Institutions.

Dr. Ines Basalo, University of Miami

Dr. Ines Basalo, Associate Professor in Practice in Mechanical and Aerospace Engineering at the University of Miami, received her Ph.D. in mechanical engineering from Columbia University and has taught since then. She is actively involved in the undergraduate education of students at the College of Engineering, including organizing and executing the annual Senior Design Expo. Before joining the University of Miami in 2014, she was an adjunct professor at Columbia University and the Cooper Union in New York City.

Dr. Alexandra Coso Strong, Florida International University

As an assistant professor of engineering education at Florida International University, Dr. Alexandra Coso Strong works and teaches at the intersection of engineering education, faculty development, and complex systems design. Alexandra completed her graduate degrees in Aerospace Engineering from Georgia Tech (PhD) and Systems Engineering from the University of Virginia (UVa).

Dr. Meagan R. Kendall, University of Texas at El Paso

An Associate Professor at The University of Texas at El Paso, Dr. Meagan R. Kendall is a founding member of the Department of Engineering Education and Leadership. With a background in both engineering education and design thinking, her research focuses on how Latinx students develop identities as engineers and navigate moments of identity interference, student and faculty engineering leadership development through the Contextual Engineering Leadership Development framework, and promoting student motivation. Dr. Kendall is the Past Chair of the Engineering Leadership Development Division of ASEE.

Lessons learned about empowering engineering instructional faculty through a group coaching model.

Introduction

This paper reports on the development and use of a group coaching model for engineering educators, one of the outcomes of the AMPLIFY project, a funded multi-year, cross-institutional action research project. This project was established to explore and enhance the perspectives and experiences of Engineering Instructional Faculty (EIF) at Hispanic Serving Institutions (HSIs). EIF are a rapidly growing faculty population at HSIs [1], [2], who are characterized as faculty who hold full-time, fixed-term positions, with their main duty being teaching [3]. They are leading educational change and innovation to enhance student learning outcomes, particularly for underrepresented groups in STEM [4]. The project, therefore, recognizes the value and existing contributions of engineering instructional faculty and seeks to provide the support structures that acknowledge their desire to build their leadership capacity towards educational change.

Drawing upon prior work exploring EIFs [5], [6], [7], our EIF case study research [8], [9], and existing educational development scholarship, a professional development program was designed, which included a group coaching component. The AMPLIFY Institute encompassed a two-day, on-site "kick-off" workshop, virtual coaching sessions, and a virtual celebratory event. These activities brought together thirty-six EIF participants from thirteen HSIs across the United States, from different disciplines, and levels of their careers. Two cohorts of EIF participants were hosted at a HSI local to them, in the fall of 2022 and 2023. Upon application and acceptance to the program, these engineering instructional faculty were recognized as fellows of the project, awarded a stipend, and guided through scoping a project focused on educational change to work on throughout the rest of the program. This paper focuses explicitly on the group coaching model, with the framework for this institute outlined in prior work [10].

The case study research and the subsequent curriculum design for the group coaching model were guided by theoretical frameworks of self-efficacy [11] and agency [12]. These frameworks provide a foundation for understanding the influences on an individual's decision to take action (and which action) toward educational goals that matter to them. In particular, the agency framework posits that professional capital (such as that can be developed in a group coaching setting) can broaden an individual's awareness of possible actions to reach their goals [13]. Consequently, a group coaching model was implemented to equip EIFs with the necessary tools to lead educational change at their HSI. Coaching, often misinterpreted as other forms of professional development such as mentoring or consultation, is a unique practice that avoids advice-giving strategies and encourages a client to seek solutions within themselves [14], [15]. This coaching model was designed to encourage reflective practice, broaden their community (thereby enhancing their understanding of their HSI context), and increase awareness of available resources and opportunities.

The group coaching approach, guided by the model of the International Coaching Federation (ICF) [16], was designed for consistent interaction throughout a semester. It included six sessions, each centered around a specific topic, along with two extra sessions to accommodate any scheduling issues or individual meetings. Each session was divided into four parts: a 5-10-

minute informal check-in for fellows to share their progress, a 10–15-minute agenda-setting period for reflection and objective identification for the session, a 30–45-minute group discussion leveraging reflective coaching tools or open-ended, inquiry-based questions, and 10–15-minute conclusion where fellows share their achievements from the session and formulate an accountability plan for the next session. As part of the action research process, this group coaching model was revised in a second iteration of the institute. This paper aims to disseminate five lessons learned to faculty developers in designing and leading a group coaching model.

(1) Engineering instructional faculty are seeking community, over expertise.

Previous research and the case study research for this project identified that the professional development needs of EIF are centered around building community [4]. EIFs are seeking to engage in learning experiences that involve learning from other EIFs, sharing their efforts and being recognized for them, and receiving feedback from fellow faculty in similar roles and contexts [10], [17]. This reaffirms previous research that EIFs, a growing faculty population, are seeking to connect and build community [4]. Interestingly, the findings also showed limited discussion prioritizing the role of an expert to inform learning experiences for EIFs. Therefore, in response to these findings, the research team sought to reimagine the role of a facilitator, and design learning experiences that recognized both the individual and collective knowledge of EIFs. As a team, we had to strategically detach from our existing experience with mentoring and facilitation and be led by the case study findings to support our focus population.

(2) The distinctions of facilitation and coaching are key to adopting a coaching mindset.

To adopt a coaching mindset, the research team sought to recognize the distinction between a facilitator and a coach. While both facilitators and coaches play crucial roles in fostering the growth of EIFs, they serve distinct purposes. A facilitator primarily guides the collective learning process during short-term events, and large group settings, like workshops or meetings, creating an environment where acquiring content knowledge is key, and participants can share ideas and learn from each other [18], [19]. Consequently, the kick-off workshop, which we considered a short-term engagement with a set agenda, was led by four facilitators of the research team, who guided a cohort of fellows through participatory, design-based, and reflective activities. Aligned with the role of a facilitator, the team imparted knowledge and relevant expertise to support the EIF as they scoped out their project ideas. With the workshop's focus on collective development, fellows were encouraged to adopt multiple perspectives or lenses to reflect on topics related to empathizing with their students, educational leadership, agency, and their HSI context. As facilitators, we provided a collaborative space for the EIF to ask questions, and challenge concepts shared, and in turn, we generated insights as they individually reflected on their projects [10].

The facilitators during the kick-off workshop also became coaches for group coaching sessions, highlighting a shift from facilitator to coach, and emphasizing the dual roles at play. We define a coach as a role that centers focus on the individual in one-on-one or small group engagements, uses open-ended questioning, and holds space for reflective practice, so individuals can learn tools to navigate challenges and work towards their goals [14], [15]. After the initial workshop, fellows engaged in group coaching sessions with 3-5 fellows in each group. These sessions were

hosted and recorded via Zoom, enabling participation without local constraints, and the opportunity for fellows and the research team to analyze session recordings and transcripts. Each cohort had a dedicated coach and a graduate research assistant who provided administrative and logistical support. The four cohorts were also determined by the fellows' and coach's availability. Sessions were designed to support the fellows as they identified resources, addressed challenges, and achieved milestones within their educational change projects, with the regular sessions providing a structure for accountability. The topics that structured the sessions were framed as open-ended questions grounded in both the theoretical frameworks, the emerging results of the case study research, and the identified learning outcomes. These topics included:

- Session 0: What is coaching? What can I expect from this experience?
- Session 1: Who is my Team? What are my resources?
- Session 2: What does it look like for me to lead as an EIF?
- Session 3: How do you leverage your students as assets?
- Session 4: Where am I now and what do I need to go from here?
- Session 5: What will success look like? How will I know?
- Session 6: What's next?

Understanding the difference between a coach and a facilitator was key for our research team to avoid becoming an authoritative role model or 'expert.' We used these definitions to discuss openly with fellows at the start of our sessions, that as coaches, we would avoid advice-giving [15], and rather through coaching exercises provide clear purpose and direction for the EIF to own and lead their future change efforts. Occasionally, fellows would ask for specific feedback on topics, and in such cases, resources were shared to the entire cohort, or fellows would be referred to another team member, local instructional design resource, or mentor (discussed later in this paper). Imparted through coach training, we wanted to avoid withholding information, but rather help identify opportunities in their support network they could use in the future.

(3) Consider multiple pathways to train and adopt a coaching mindset.

This project revealed that for a faculty developer to adopt the mindset of a coach, some core training is indeed necessary. This training includes practice coaching with clients, observations of sessions, and exposure to those in professional coaching practice. To inform the design of the group coaching sessions, members of the research team engaged in coach training grounded in the core values, ethics, and competency model of the International Coaching Federation (ICF) [16]. At its core, ICF emphasizes the partnership between a coach and client, and the importance of ongoing reflective practice and situational awareness [20]. ICF awards credentialing for coach practitioners which involves building coaching hours with clients, engaging in required training hours, and working towards assessments [21], [22].

However, access to professional coach training is realistically not accessible for all those in faculty development – it requires funding, time, and long-term commitment toward this professional practice. In consequence, members of the research team engaged in varying levels of ICF coach training to inform and create the first iteration of a coaching curriculum. Due to availability, three out of four coaches engaged in at least one professional coach training course from an ICF-accredited program, within a group coaching setting, led by a PCC-level coach [23]. For the entire research team to adopt a coaching mindset, this required cross-training by

engaging with ICF resources, leading, or observing practice coach sessions, and following a designed coaching template for each session. During both iterations of the series of coaching sessions, coaches would debrief each session in weekly meetings, and in asynchronous chat, to learn from and critically reflect on the coaching practice. This would require observing recordings of coaching sessions and reviewing memos. Further, to support a coaching mindset across research assistants, throughout both cohorts, a graduate assistant was assigned to each coaching group to capture memos and provide feedback on the session for future iterations. This also prepared research assistants to engage in future efforts to analyze and evaluate the coaching model.

(4) Provide multiple orientation activities to help introduce the coaching model.

The case study research outlined how engineering instructional faculty had not previously engaged in individual or group coaching. Rather, the prevailing formats for professional development were workshops, virtual events, and faculty learning communities [10]. Based on the expectation that there may be preconceived notions of coaching, the research team integrated an explicit coaching activity into the kick-off workshop to acclimate the faculty to this approach. The coaching activity was structured as a 90-minute session, inviting fellows to formulate a mission statement for their project and respond to open-ended, powerful questions [15] designed to provoke their future insights regarding their selected projects. This activity was embedded within the workshop as a coaching session, providing participants with an experiential understanding of coaching.

During the kick-off workshop's initial iteration, fellows were assigned to different tables daily to facilitate connections with multiple EIFs and finalize coaching groups. However, this setup prevented fellows from being able to sit with their coaching groups, leading to introductions and logistical discussions consuming a significant part of the first virtual coaching session. In contrast, the second iteration adopted a more stable, forward-thinking approach. During the kick-off, we introduced goals and related coaching 'homework' such as conducting student interviews. From the second day, fellows were assigned to the same table as their coaching group promoting mutual learning and rapport building. An orientation session was also added before the six sessions (Session 0), focusing on grounding the fellows, outlining the coaching format, and accessing shared resources. Lastly, during the application process, potential fellows could request a meeting to inquire about the institute and discuss the coaching format. Through repeated engagement with coaching concepts, and by creating spaces for building community within their coaching group, the groups began Session 1 with clearer expectations of a coaching setting and a better familiarity with their fellow members.

(5) Nurture individuals to take ownership of coaching sessions.

In the initial coaching sessions, a standard template or format was used to familiarize coaches and fellows with the session structure. During these sessions, a coach would leverage a standard coaching template that included several key components. First, there were check-in questions designed to celebrate the participants' wins since the last session. Next, coaches facilitated agenda-setting discussions, helping fellows define the goals they wanted to work towards during the session. With that agenda in place, the majority of the session would include a selection of

questions and reflective exercises to encourage discussion towards the session topic. Finally, the session would conclude with fellows identifying actionable steps and strategies to enhance accountability.

However, to empower, and to build capacity for a fellow to lead and influence the direction of a session, coaches would deviate from the template, and guide the session centered on the individual and collective goals of the coaching group, in line with a coaching mindset [14], [15]. Techniques such as using EIFs' responses as questions or initiating short group discussions about the session's plan were employed. As fellows gained confidence, they directly interacted with each other and used coaching sessions to work on their projects. Recognizing the coaching sessions were spaces held for them, some fellows requested more reflection time in sessions and used make-up sessions as working sessions (leveraging the four-part coaching structure for accountability). Coaches also created avenues for fellows to be held accountable through weekly reminders and inquiries about their progress, or filling out a weekly, shared spreadsheet to track progress.

Conclusion

Our insights underscore that adopting a coaching mindset can enhance the professional development of engineering instructional faculty. It encourages reflective practice, broadens community and relationships, and increases individual awareness of resources and opportunities. To explore the creation of a group coaching model, a faculty developer would be willing to adopt a coach mindset, engage in coach training, provide multiple opportunities to orient faculty to coaching, and invite fellows to make decisions towards their professional development.

The transition from a facilitator to a coach role offers a valuable opportunity to improve a faculty developer's interpersonal and leadership skills, and potentially, those of the fellows. For instance, two cohorts of engineering educators have experienced coaching and explored coaching behaviors, various tools, and strategies for use with students and EIF colleagues. Consequently, to expand their educational leadership experience, four fellows from the first iteration were awarded a stipend to serve as peer mentors in the second iteration. Like a facilitator role, these mentors underwent mentor training, participated in the kick-off, and presented outcomes from their educational change projects to the cohort. During the institute, they observed coaching sessions and provided insight to individual fellows during one-on-one consultations or in sessions. Therefore, as we prepare for the final iteration of the group coaching model in fall 2024 with a cohort of 40 fellows, we anticipate uncovering an opportunity to transition EIF fellows into a coaching role. This learning experience aims to support their growth as an educational change leader and build a self-sustaining faculty development program.

References

[1] C. W. Fitzmorris, "The career goals and pathways of full-time non-tenure track engineering faculty," PhD Thesis, University of Oklahoma, Norman, Oklahoma, 2018.

[2] K. Thedwall, "Nontenure-track faculty: Rising numbers, lost opportunities," *New Directions for Higher Education*, vol. 2008, no. 143, pp. 11–19, 2008, doi: 10.1002/he.308.

[3] V. Bracho Perez, C. M. Perez, M. R. Kendall, and G. Henderson, "WIP: Faculty Developers' perceptions of Engineering Instructional Faculty engagement in instructional professional development at HSIs," in *Proceedings of the 2022 ASEE Annual Conference & Exhibition*, Minneapolis, MN, 2022.

[4] A. Coso Strong, M. R. Kendall, I. Basalo, and G. Henderson, "Impact of Faculty Development Workshops on Instructional Faculty at Hispanic-serving Institutions," in *ASEE Annual Conference & Exposition*, Tampa, FL, 2019.

[5] M. R. Kendall, A. Coso Strong, I. Basalo, G. Henderson, D. Ural, and M. Williams, "Co-Designing an Engineering Education Research Agenda," Public Research Report, 2019. Accessed: Sep. 11, 2019. [Online]. Available: http://eel.utep.edu/hsi/workshop-outcomes.html

[6] G. Henderson, M. R. Kendall, I. Basalo, and A. C. Strong, "Co-Designed Research Agenda to Foster Educational Innovation Efforts Within Undergraduate Engineering at HSIs," presented at the 2019 ASEE Annual Conference & Exposition, Jun. 2019. Accessed: Aug. 11, 2019. [Online]. Available: https://peer.asee.org/co-designed-research-agenda-to-foster-educational-innovation-efforts-within-undergraduate-engineering-at-hsis

[7] M. R. Kendall, A. Coso Strong, I. Basalo, and G. Henderson, "Rethinking Engineering Education at Hispanic Serving Institutions." Accessed: May 15, 2020. [Online]. Available: http://eel.utep.edu/hsi/

[8] Y. A. Urquidi Cerros *et al.*, "The AMPLIFY Project: Experiences of Engineering Instructional Faculty at HSIs," in *Proceedings of the 2022 ASEE Annual Conference & Exhibition*, in NSF Grantees Poster Session. Minneapolis, MN, 2022.

[9] Y. Urquidi Cerros, M. Kayyali, M. R. Kendall, and A. Coso Strong, "Motivational Factors Influencing Engineering Faculty's Pursuit of Instructional Faculty Positions at Hispanic-Serving Institutions," in *Proceedings of the ASEE/IEEE Frontiers in Education Conference*, Lincoln, NE: American Society for Engineering Education/IEEE, 2021.

[10] J. R. S. Molano *et al.*, "AMPLIFY Institute: A Professional Development Program Designed for and with Engineering Instructional Faculty.," in *2023 ASEE Annual Conference & Exposition Proceedings*, Baltimore, MD, Jun. 2023.

[11] A. B. Dellinger, J. J. Bobbett, D. F. Olivier, and C. D. Ellett, "Measuring teachers' self-efficacy beliefs: Development and use of the TEBS-Self," *Teaching and Teacher Education*, vol. 24, no. 3, pp. 751–766, Apr. 2008, doi: 10.1016/j.tate.2007.02.010.

[12] C. M. Campbell and K. O'Meara, "Faculty Agency: Departmental Contexts that Matter in Faculty Careers," *Res High Educ*, vol. 55, no. 1, pp. 49–74, Feb. 2014, doi: 10.1007/s11162-013-9303-x.

[13] A. Coso Strong, C. J. Faber, W. C. Lee, C. A. Bodnar, C. Smith-Orr, and E. McCave, "In pursuit of impact: Toward a contextualized theory of professional agency of engineering education scholars," *Journal of Engineering Education*, vol. 112, no. 1, pp. 195–220, 2023, doi: 10.1002/jee.20496.

[14] T. Huston and C. L. Weaver, “Peer Coaching: Professional Development for Experienced Faculty,” *Innov High Educ*, vol. 33, no. 1, pp. 5–20, Jun. 2008, doi: 10.1007/s10755-007-9061-9.
[15] M. C. Horner-Devine *et al.*, “Peer Coaching Circles for Ongoing Faculty Development,” in *Handbook of STEM faculty development*, S. Linder, C. Lee, S. K. Stefl, and K. A. High, Eds., Charlotte, NC: Information Age Publishing, Inc, 2023.
[16] “ICF, the Gold Standard in Coaching | Read About ICF.,” International Coaching Federation. Accessed: Feb. 07, 2024. [Online]. Available: https://coachingfederation.org/about
[17] A. Coso Strong, M. R. Kendall, and G. Henderson, “Voices of Engineering Faculty at the Margins: Supporting Professional Agency through Faculty Development,” in *Handbook of STEM Faculty Development*, S. M. Linder, C. Lee, and K. High, Eds., 2022.
[18] G. Mosely and L. Markauskaite, “Design facilitation practice: an integrated framework,” in *Research Handbook on Design Thinking*, Edward Elgar Publishing, 2023, pp. 25–44. Accessed: Feb. 07, 2024. [Online]. Available: https://www.elgaronline.com/edcollchap/book/9781802203134/book-part-9781802203134-8.xml
[19] G. Mosely, L. Markauskaite, and C. Wrigley, “Design facilitation: A critical review of conceptualisations and constructs,” *Thinking Skills and Creativity*, vol. 42, p. 100962, Dec. 2021, doi: 10.1016/j.tsc.2021.100962.
[20] “The Gold Standard in Coaching | ICF - Core Competencies,” International Coaching Federation. Accessed: Feb. 07, 2024. [Online]. Available: https://coachingfederation.org/credentials-and-standards/core-competencies
[21] “PCC Markers,” International Coaching Federation. Accessed: Feb. 07, 2024. [Online]. Available: https://coachingfederation.org/credentials-and-standards/performance-evaluations/pcc-markers
[22] “Performance Evaluations,” International Coaching Federation. Accessed: Feb. 07, 2024. [Online]. Available: https://coachingfederation.org/credentials-and-standards/performance-evaluations
[23] K. Linder, “Curriculum, Higher Ed Coaches,” Higher Ed Coaches. Accessed: Feb. 07, 2024. [Online]. Available: https://www.higheredcoaches.com/curriculum/