2026 ASEE ANNUAL CONFERENCE June 21–24, 2026 | Charlotte Convention Center, NC
Host Sponsor UNC Charlotte
ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION
Paper ID #52772

WIP: Building Capacity for GenAI: Faculty Development through Communities of Practice and Student Partnership

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Abstract

Work-in-Progress Paper: This paper reports on the design and early implementation of TEACH-AI (Teaching, Exploration, and Community Hub for AI), a faculty development initiative at Clemson University that supports the continuing education and professional growth of educators as they navigate the integration of generative artificial intelligence (GenAI) in teaching and learning. Situated within the context of engineering education and operating as a cross-institutional hub, TEACH-AI brings together Faculty AI Navigators and undergraduate student partners to foster ethical inquiry, collaborative experimentation, and shared leadership. Rather than focusing on tool adoption alone, the initiative emphasizes sustained professional learning that supports educators' roles as teachers, collaborators, and leaders in a rapidly changing educational landscape. This paper describes the program's conceptual grounding, design decisions, and preliminary findings from early participation and survey data, and poses questions related to evaluation, sustainability, and transferability. The paper will be presented as an interactive lightning round table designed to foster dialogue on community-based approaches to GenAI-focused faculty development.

Introduction

Generative artificial intelligence (GenAI) is rapidly reshaping teaching, learning, and professional expectations across higher education. Educators are navigating complex questions related to ethics, assessment, academic integrity, accessibility, and the impact on teaching and learning (Watson and Raine, 2025). While curiosity and experimentation with GenAI continue to increase, many faculty members report uncertainty about how to engage in ways that are pedagogically meaningful, ethically responsible, and aligned with institutional values (McDonald et al., 2025). Together, these conditions highlight the need for faculty development approaches that extend beyond tool-focused training toward sustained professional learning grounded in collaboration, reflection, and community.

Within engineering education, GenAI introduces pedagogical, ethical, and professional considerations that intersect directly with core instructional environments responsible for shaping students' professional identity, decision-making authority, ethical accountability, and readiness for complex sociotechnical practice. Engineering faculty are therefore navigating how GenAI aligns with established learning outcomes, accreditation expectations, and disciplinary norms, while simultaneously preparing students for professional environments in which AI-enabled tools are increasingly commonplace. These conditions heighten the need for support structures that enable instructors to make principled, outcomes-aligned decisions about when, why, and how GenAI should be integrated into engineering teaching and learning.

Emerging research illustrates both the instructional promise of generative AI and the complexity of its responsible integration. Design-based evidence suggests that generative AI can function productively as a pedagogical scaffold, supporting critical thinking, metacognitive reflection, and self-directed learning readiness, when paired with structured validation processes that mitigate

overreliance on AI-generated outputs (Yihun, 2025). At the same time, a growing body of literature emphasizes that current scholarship on GenAI in undergraduate engineering education remains fragmented, with student perceptions, ethical considerations, and pedagogical implications often examined in isolation, pointing to the need for a cohesive framework that foregrounds ethics, curricular redesign, and continuous upskilling of both students and educators (Paul, 2025). Survey-based and empirical studies further document substantial variation in faculty and student understandings and adoption of GenAI, including divergent levels of faculty acceptance and resistance, patterns of both productive use and misuse by students, and a persistent gap in familiarity and engagement between the two groups (Khalid, 2025; Luo, 2025). Collectively, these findings highlight the necessity of faculty development that equips instructors to balance pedagogical innovation with ethical imperatives and foster both technical competence and professional responsibility in the next generation.

This work-in-progress paper presents TEACH-AI (Teaching, Exploration, and Community Hub for AI), a Clemson University initiative designed to support continuing education through community-based faculty development. A spring 2025 faculty survey found that 70% of respondents reported a need for GenAI training, underscoring the urgency and relevance of this work and aligning with national findings that point to significant gaps in AI literacy and professional preparation in higher education (Lo, 2024). The paper focuses on how TEACH-AI functions as an umbrella structure that integrates faculty leadership, cross-unit collaboration, and student partnership to support ethical and innovative teaching with GenAI.

Theoretical Foundations of TEACH-AI

TEACH-AI is informed by multiple, complementary bodies of scholarship that conceptualize faculty learning as social, situated, and iterative, and that emphasize sustained, community-based approaches to professional development rather than isolated skill acquisition (Table 1). These perspectives frame faculty development as an ongoing process of sensemaking, collaboration, and identity development, particularly in contexts characterized by rapid technological change.

Community-Based Faculty Development. Scholarship on communities of practice frames learning as a social process in which individuals participate in collective activity and develop shared meaning through ongoing interaction (Lave & Wenger, 1991; Wenger, 2002). Within faculty development, community-based approaches have been shown to support sustained engagement and collective sensemaking, contributing to the co-construction of knowledge about instructional change, particularly as instructional contexts and technologies evolve (Borrego & Henderson, 2014). Rather than positioning expertise as centralized or static, communities of practice emphasize distributed expertise and learning through participation, making them well suited for GenAI professional development.

Design-Based and Iterative Professional Learning. Scholarship on change and transformation in engineering higher education emphasizes that instructional improvement is complex, context-dependent, and iterative rather than linear or prescriptive (Borrego & Henderson, 2014; McKenna et al., 2016). From this perspective, professional development is conceptualized not as a fixed sequence of workshops or trainings, but as an ongoing process of inquiry, reflection, and refinement shaped by context, experience, and evidence.

Faculty Development for Emerging Technologies. Prior research on GenAI faculty development highlights the limitations of tool-centered adoption and underscores the importance of situating GenAI within pedagogical purpose, disciplinary context, and ethical consideration (Paul, 2025; Khalid, 2025). Effective learning in this space emphasizes experimentation, reflection, and peer dialogue rather than prescriptive adoption (Khalid, 2025; Luo, 2025).

Ethics and Professional Responsibility. Engineering education scholarship positions ethical reasoning and professional responsibility as foundational outcomes of engineering formation, emphasizing obligations to public welfare, safety, equity, and transparency. Ethical frameworks highlight the importance of explicitly engaging educators in examining values, consequences, and accountability in technical decision-making, particularly as emerging technologies reshape professional practice (National Academy of Engineering, 2020; ABET, 2025).

Student-Faculty Partnership in Educational Innovation. Student-faculty partnership scholarship positions students as collaborators in the design, implementation, and evaluation of teaching and learning, rather than as passive recipients of instruction (Cook-Sather et al., 2014). Such partnerships support transparency, trust, and mutual learning, and are particularly valuable in contexts where student experiences, concerns, and everyday practices directly shape classroom dynamics (Mercer-Mapstone et al., 2017). In GenAI-integrated learning environments, student–faculty partnership supports collective navigation of uncertainty, enabling instructors and students to negotiate emerging norms, risks, and opportunities together.

Table 1. Theoretical Alignment of GenAI Faculty Development

Development Dimension	Theoretical Anchor	Core Conceptual Emphasis
Community-based sensemaking	Communities of practice; social, situated learning	Learning through participation, shared language, and collective meaning-making
Iterative professional growth	Design-based and improvement-oriented professional development	Continuous refinement informed by evidence and reflection
Pedagogy- and discipline-centered technology integration	Faculty development for emerging technologies	Technology situated within pedagogical and disciplinary practice
Ethical and responsible technological practice	Engineering ethics; professional responsibility	Values, accountability, public welfare, and ethical judgment
Shared authority in educational innovation	Student-faculty partnership	Co-construction, transparency, and mutual learning

These alignments conceptualize GenAI faculty development as community-based, iterative, ethically grounded, and partnership-oriented professional learning.

TEACH-AI Structure

TEACH-AI was intentionally designed to address multiple, interrelated faculty development needs arising from rapid advances in GenAI. Rather than centering tool adoption, the initiative emphasizes sustained professional learning grounded in inquiry, ethics, and collaboration. First, TEACH-AI supports faculty exploration of GenAI in teaching and learning by providing space,

support, and community for experimentation, reflection, and shared practice. Faculty are encouraged to examine what works, for whom, and under what conditions within their disciplinary and institutional contexts. A second core purpose is promoting ethical, transparent, and responsible GenAI use. Faculty are positioned as leaders who guide students and colleagues through questions not only of what GenAI can do, but what it should and should not do in educational settings. Third, the hub advances GenAI literacy among faculty, staff, and students, emphasizing informed decision-making grounded in critical thinking rather than fear or novelty. Finally, TEACH-AI was designed to connect individuals and efforts across campus, reducing duplication, elevating existing work, and strengthening a shared community so educators are not navigating GenAI in isolation.

An Integrated Faculty Development Ecosystem

TEACH-AI functions as an integrated ecosystem for faculty development in GenAI teaching and learning. The initiative was intentionally designed as a flexible, cross-disciplinary hub that connects professional learning, institutional priorities, and collaborative experimentation. Its activities include faculty learning communities, workshops, curated resources, consultation, and opportunities for co-design, allowing educators to engage with GenAI in ways that align with disciplinary contexts, instructional goals, and levels of experience. Central to TEACH-AI's design is the integration of two complementary components: a Faculty AI Navigators network and the LENS (Learners and Educators in Novel Spaces) student partnership initiative. Together, these components form a cohesive ecosystem that supports educator growth while grounding instructional innovation in authentic teaching and learning contexts.

Distributed Leadership and Faculty AI Navigators

TEACH-AI employs a distributed leadership approach grounded in the recognition that no single individual or unit can or should own GenAI in teaching and learning. A small core leadership group provides strategic direction, secures resources, builds partnerships, and aligns the initiative with broader institutional priorities. This work is supported by a broader cross-unit leadership network that includes representatives from the teaching and learning center, libraries, career center, undergraduate and graduate colleges, faculty and student affairs, research, and related units, enabling coordination and reducing duplication of effort.

Faculty AI Navigators form the core of day-to-day faculty development activity within this structure. Navigators participate in rotating, project-based roles that maintain low-barrier, interest-driven engagement while expanding the initiative's capacity. They contribute based on expertise, curiosity, and availability, and may shift roles as interests evolve. Through organizing discussions, leading workshops, co-designing instructional resources, and mentoring peers, Navigators function as both learners and leaders, modeling reflective practice and ethical engagement with GenAI. Example project-based Navigator roles include contributing to an ethics working group that develops instructional cases, piloting GenAI-informed assignment redesigns within a course, curating discipline-specific prompt libraries, and co-facilitating workshops or design studios. These roles are optional, time-bounded, and interest-driven, allowing faculty to participate at levels aligned with availability and curiosity.

Student Partnership (LENS)

The LENS (Learners and Educators in Novel Spaces) initiative extends TEACH-AI by positioning undergraduate students as partners, rather than participants, in shaping GenAI teaching and learning. In contrast to faculty communities of practice that center instructor perspectives, LENS integrates learner voice to ensure that GenAI-informed pedagogy is transparent, equitable, and credible from the student standpoint, particularly with respect to academic integrity, workload, and trust. Through LENS, students collaborate with faculty to co-design learning activities and contribute learner perspectives, supported in partnership with the Career Innovation Lab, which links teaching innovation to career readiness by formalizing student GenAI roles, emphasizing transferable GenAI competencies, and framing GenAI engagement as preparation for professional practice. For faculty, LENS supports reflective teaching through sustained access to student perspectives; for students, it develops skills in communication, collaboration, and ethical reasoning. Grounded in student–faculty partnership scholarship (Cook-Sather et al., 2014), LENS bridges faculty development, student experience, and institutional innovation, supporting sustained engagement, cross-silo knowledge sharing, and clearer pathways for tracking outcomes related to responsible GenAI use. LENS partnerships are particularly consequential in engineering, where GenAI use can profoundly influence processes of problem framing, iteration, documentation, and the exercise of engineering judgment.

Professional Learning, Training, and Ethical Orientation

TEACH-AI integrates professional learning opportunities that emphasize GenAI literacy, ethical use, and pedagogical alignment. Faculty development activities are aligned with research identifying three core areas of need: how to use GenAI in teaching, how to teach about GenAI, and how GenAI systems function (Stanford University, 2025). These needs are addressed through layered training pathways that support differentiated learning and respect prior expertise. All participants begin with a foundational GenAI information literacy experience focused on navigating the changing information landscape, evaluating GenAI-generated outputs, and engaging responsibly with GenAI tools. Building on this shared foundation, faculty select additional learning opportunities aligned with three areas: concepts and evaluation, ethics and societal impacts, and prompting and information literacy, as articulated in Clemson Libraries' AI Literacy Framework (Grant, 2025). Options are labeled by suggested level (beginner, intermediate, advanced), and faculty with substantial prior experience may document existing knowledge rather than repeating introductory content. Completion is confirmed through a brief survey, and participants receive a training certificate recognizing continuing education and shared standards within the community.

Communication Infrastructure and Shared Workspace

TEACH-AI uses a centralized digital workspace in Microsoft Teams to support communication, coordination, and resource sharing across the community. The shared environment includes structured channels for topical working groups, general announcements, and cross-cutting conversations, as well as a centralized file repository that houses meeting agendas, shared documents, recordings, and curated resources. Integrated calendaring and meeting links provide consistent access to synchronous sessions, while threaded discussions enable asynchronous

dialogue and ongoing sensemaking between meetings. Faculty onboarding materials supported initial access and navigation of the platform, and guidance on notification settings, channel use, and file organization promotes sustainable participation without overwhelming contributors. Importantly, this digital infrastructure is intentionally treated as a work in progress, reinforcing a culture of iteration, patience, and shared responsibility. In this way, the platform itself becomes part of the learning ecosystem, modeling the same adaptive, community-centered approach that underpins TEACH-AI's broader faculty development philosophy.

Preliminary Findings

As a work-in-progress, TEACH-AI's evaluation efforts are formative and focused on understanding participation patterns, perceived value, and early indicators of instructional influence. Consistent with the initiative's theoretical framing, preliminary findings highlight early evidence of community formation, distributed leadership, and collective sensemaking around ethical and pedagogical GenAI integration.

Preliminary participation data indicate strong faculty engagement with TEACH-AI and emerging institutional capacity for distributed GenAI leadership. At the onset of the Fall 2025 semester, 59 faculty applied to serve as Faculty AI Navigators; by the end of the semester, interest had increased to more than 90 faculty, representing a broad cross-section of academic units and professional roles. Navigators span a wide range of disciplines and experience levels, with the largest proportion identifying as intermediate users who already actively employ GenAI tools in teaching or work, alongside participants reporting basic, beginner, and advanced experience. This distribution suggests that the cohort is positioned not as an introductory audience, but as a community capable of applied experimentation, peer mentoring, and localized leadership within departments and colleges. Collectively, these patterns point to early momentum for a train-the-trainer model and a sustainable, community-based approach to scaling GenAI development.

Early community interactions further illustrate TEACH-AI's function as a site of collective sensemaking. The Microsoft Teams workspace has operated as an active digital hub for communication, coordination, and shared inquiry, supporting both structured communication (e.g., announcements, meeting logistics, pinned resources) and organic dialogue. Faculty use the space to surface emerging tools, raise questions about student privacy and platform access, share campus connections, and collaboratively interpret institutional guidance. Threaded discussions, reactions, and shared resources enable ongoing asynchronous engagement between meetings, reinforcing transparency, responsiveness, and distributed leadership. Rather than serving solely as an information repository, the Teams environment functions as a living community space that models the collaborative, iterative, and responsive culture central to TEACH-AI's faculty development philosophy.

As an initial collective task, the TEACH-AI community of practice collaborated to draft an Clemson-aligned educational training plan for an enterprise-level large language model. The draft plan articulates shared priorities for responsible-use framing and policy awareness, AI literacy as a core competency, and integration of ethics directly into foundational GenAI trainings. It further proposes differentiated learning pathways by role (students, faculty, instructional staff, and staff), capacity-building through train-the-trainer and co-design models,

and sequencing of offerings across the academic calendar to support progression from awareness to application to shared practice. Together, these preliminary findings suggest that TEACH-AI is coalescing around an ecosystem-oriented, ethically grounded, and capacity-building approach to GenAI faculty development that aligns with the initiative's theoretical foundations.

Implications for Engineering Education

GenAI presents distinctive opportunities and challenges within engineering education, particularly in relation to design processes, computational problem-solving, laboratory work, teamwork, and professional ethics. Preliminary findings from TEACH-AI suggest that engineering faculty benefit from professional learning environments that foreground pedagogy and ethical inquiry alongside technical capability, and that create space for experimentation within disciplinary contexts rather than prescribing uniform uses of GenAI. For engineering faculty developers, TEACH-AI underscores the value of community-based and distributed models of professional learning that leverage peer expertise, create multiple entry points for engagement, and incorporate student perspectives into sensemaking about GenAI. Such approaches may enable sustained, context-sensitive exploration of GenAI while preserving core commitments of engineering education, including design thinking, safety, and professional responsibility.

Implications for Faculty Development

TEACH-AI highlights the value of community-based, distributed approaches to faculty development in contexts of rapid technological change. Flexible participation ecosystems, shared leadership, and integration of ethical inquiry and student partnership support sustained professional learning without relying on centralized expertise or prescriptive training ecosystems. These design choices suggest that faculty development initiatives addressing emerging technologies benefit from prioritizing adaptability, collaboration, and reflective practice while creating ecosystems that connect campus efforts and reduce duplication. These findings align with scholarship emphasizing faculty learning as social, iterative, and practice-centered, and suggest that community-based ecosystems may be particularly well suited for supporting educators as they navigate evolving technological landscapes.

Future Directions

TEACH-AI represents an evolving approach to faculty development in the context of generative AI, positioning professional learning as a shared, community-based endeavor. As the initiative continues to mature, important questions remain regarding how such communities are sustained over time, how leadership and participation evolve, and how impact on teaching practice and educator growth can be meaningfully documented. Future work will focus on examining how participation in TEACH-AI influences instructional decision-making, faculty confidence, and pedagogical innovation, as well as how student partnerships contribute to faculty learning. Additional study will explore mechanisms for scalability and transferability to other institutional contexts. By foregrounding questions of sustainability, evaluation, and community-building, this work invites continued dialogue within the Faculty Development Division on collaborative approaches to faculty development during periods of rapid technological change.

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