

Engagement in Practice: Building an Interdisciplinary Community Around Large Language Models in Engineering Education

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Introduction

This Engagement-in-Practice paper focuses on the design and implementation of a workshop on Large Language Models (LLMs) intended for a broad community audience. In October 2024, we launched the inaugural University of Virginia (UVA) Workshop on LLMs for Science and Engineering as a pilot initiative to integrate emerging LLM technologies into engineering education through community-based engagement. The workshop aimed to build interdisciplinary partnerships and foster inclusive learning environments that support the responsible and collaborative use of LLMs. This effort aligns with community engagement principles by promoting mutual benefit, inclusive participation, and sustained collaboration across academic and societal boundaries [1].

Research on institutional strategies for engaging higher-education communities in the rapidly evolving AI landscape is accelerating, yet comprehensive, campus-wide perspectives remain limited. Systematic analyses of LLM adoption in higher education show that, while generative AI is transforming instructional practices, its effective use depends heavily on institutional infrastructure, ethical oversight, and cross-stakeholder collaboration [2]. Broader reviews of AI in education likewise emphasize that meaningful adoption requires coordinated efforts among universities, policymakers, and community organizations to ensure equitable and responsible use of AI technologies [3].

Parallel to these trends, higher-education scholarship has increasingly highlighted community engagement as a central institutional mission. Frameworks for community-engaged universities argue that campuses not only educate learners but also serve as civic and regional anchors, shaping local capacity, democratic participation, and social well-being [4]. Case studies from U.S. institutions further illustrate how universities embed community partnerships into their strategic priorities—through platforms, public-facing events, and civic collaborations—demonstrating that engagement is organizationally significant, multidimensional, and tied to institutional identity [5].

Within this broader community-engagement context, AI literacy and LLM adoption intersect with institutional responsibility. Cross-national work shows that students' use of LLMs is shaped by motivational factors, ethics, and digital literacy, suggesting that institutions must intentionally cultivate informed and equitable access to AI technologies [6]. Large-scale surveys similarly reveal that informal LLM use is already widespread, with students navigating issues of trust, privacy, and accuracy largely on their own underscoring the need for institutional structures that bridge campus and community through shared norms, training, and policy guidance [7].

Complementing this, literature on community-based learning indicates that high-impact practices flourish when universities foster interdisciplinary, participatory, and socially responsive

environments—conditions that parallel the needs of AI literacy initiatives [8]. Global perspectives on community engagement in higher education reinforce that successful engagement requires cross-sector collaboration, mutually beneficial exchanges, and institutional alignment across teaching, research, and service [9].

Positioning of the present workshop study. Building on these lines of research, this paper presents an institution-wide workshop on large language models (LLMs) as a practice-oriented case study of community engagement in engineering education. The focus is not on evaluating participant outcomes, but on documenting the design principles, partnership structures, and implementation choices that supported interdisciplinary and community-connected engagement around emerging AI technologies.

This workshop is novel in several important ways. First, its thematic focus—LLMs in Scientific Discovery and Engineering Design; Current Progress of LLM Development; LLM Practices and Applications; and Broad General AI Resources and Education—is unique and rarely addressed collectively in existing workshops. Second, unlike many AI workshops that primarily present general AI concepts and mainly attract participants with limited LLM expertise, this workshop intentionally integrates rigorous research-oriented activities and actively engages LLM experts, thereby fostering meaningful research collaboration across disciplinary boundaries. Third, the workshop design and implementation operate across multiple layers: (1) multiple participant levels, ranging from community members with no prior LLM experience to domain experts; (2) multiple organizational layers, including student-led initiatives, faculty organizing committees, and school-level administrators; (3) multiple activity types tailored to different audience needs; and (4) multiple platforms—such as a dedicated website and mailing list—to support sustained community building. Finally, studies examining workshops of this nature are rare in the existing literature, and we also investigate the effectiveness of the workshop itself [10].

By situating the workshop within a broader framework of community-engaged practice, this paper highlights how intentional collaboration among faculty, students, institutional units, and local stakeholders can create sustainable infrastructures for LLMs & AI literacy and shared learning. A complementary study examines participants' learning experiences and perceptions through systematic evaluation [10]; the present paper instead centers on engagement in practice, with emphasis on organizational processes, collaborative design, and transferability.

Partnership Development

The workshop was the product of a robust, multi-layer partnership structure that brought together collaborators across academic units, university offices, student groups, and the surrounding community. It was co-organized by faculty representing several departments—including Systems and Information Engineering, Materials Science and Engineering, Computer Science, and Applied Mathematics—reflecting a shared commitment to interdisciplinary coordination and cross-domain engagement. This diverse organizing team ensured that the program content was shaped by multiple disciplinary perspectives and that the workshop addressed the needs and interests of a broad research audience.

Partnership development extended beyond the faculty leadership. A dedicated student committee, selected by the organizing committee after reviewing applicants' interests and qualifications from the broader student body, contributed to the design and execution of the event. Students led key organizational components, including lightning talk sessions, poster coordination, and local logistical planning. Their involvement formalized student–faculty collaboration and supported inclusive participation across academic levels.

A core objective of the Large Language Models for Science and Engineering Workshop was to expand collaboration not only across academic units but also between the institution and the surrounding community. The event was intentionally framed as an opportunity to “form a community around LLMs and foster potential collaboration,” inviting participation from all engineering and science departments, other academic divisions, and individuals engaged in AI-related interests across the region. This open invitation ensured broad access for undergraduate and graduate students, postdoctoral researchers, faculty, and local stakeholders invested in the emerging landscape of LLM technologies.

The workshop gathered over 160 participants from the host institution, external universities, research organizations, and the local community, creating a diverse and interconnected network for idea exchange and cross-sector dialogue. The event's structure—featuring keynotes, panel discussions, faculty talks, lightning sessions, and hands-on tutorials—supported interactions across disciplinary and organizational boundaries. These activities aligned with the workshop's stated mission.

Local community engagement played a meaningful role in this partnership landscape. By opening participation to individuals beyond the academic environment, the workshop extended LLM-related dialogue to members of the surrounding region, creating opportunities for shared learning, exposure to emergent technologies, and two-way knowledge exchange. This approach reflects a broader vision of community-engaged research and practice, where workshops serve as accessible entry points for local collaborators interested in the implications of LLMs & general AI for science, industry, and public life.

Partnership development continued beyond the event through dedicated communication infrastructure. The workshop website and mailing list were designed to support sustained contact among participants, functioning as ongoing channels for sharing resources, coordinating future activities, and maintaining a growing network of researchers, practitioners, and community members interested in LLM research and applications. These mechanisms have allowed collaborations initiated at the workshop—including those between academic researchers and regional partners—to persist and evolve.

Together, these elements illustrate how the workshop established a multi-layered partnership model: strengthening interdisciplinary connections within the institution, extending collaboration to external universities and research entities, and meaningfully incorporating local community participants into the broader ecosystem of AI engagement.

Project Design and Execution

The workshop was structured as a two-day, multi-component program designed to blend conceptual understanding, hands-on experience, and community engagement around large language models (LLMs). The design featured a coordinated sequence of pre-workshop preparation, a full day of research- and education-focused activities, and a second day centered on applied prototyping and inclusive participation. Together, these elements created an integrated learning model that supported participants across different levels of experience and disciplinary backgrounds.

Pre-Workshop Preparation. To maximize engagement during the event, the organizing committee implemented a structured set of preparatory activities. One month prior, participants were invited to submit challenges they encountered when using LLMs, which served as seed topics for Day 1 brainstorming sessions. Two weeks before the event, attendees were encouraged to propose small research or engineering ideas for the Day 2’s activities. In the final days leading up to the workshop, participants received a pre-recorded instructional video and curated reading materials introducing LLM fundamentals, ensuring a shared baseline of knowledge before the event began.

The workshop was structured as a two-day program combining expert presentations, structured discussions, student-led activities, and applied demonstrations. Each day followed a curated schedule designed to move participants from foundational concepts toward hands-on engagement with large language models (LLMs).

<i>Day 1 Schedule</i>	<i>Day 2 Schedule</i>
<i>Day1a). Invited talk (Keynote)</i>	<i>Day2a). Invited talk (Keynote)</i>
<i>Day1b). Faculty talks</i>	<i>Day2b). Roundtable discussion on broadening participation in LLM</i>
<i>Day1c). Poster sessions</i>	<i>Day2c). Poster Presentation</i>
<i>Day1d). 1st panel discussion: LLM technologies</i>	<i>Day2d). Tutorial -- resources to LLM users</i>
<i>Day1e). 2nd panel discussion: LLM applications</i>	<i>Day2e). Students lightning talks</i>
<i>Day1f). Students lightning talks</i>	

Table 1: Workshop Schedule [10]

Day 1. Day 1 opened with introductory remarks followed by a keynote on emerging advances in LLM-enabled materials design. A subsequent faculty session highlighted ongoing work across multiple engineering and computing domains. Afternoon programming included two panel discussions—one examining LLM technologies and another focused on applied use cases—providing participants with opportunities to compare disciplinary perspectives and identify shared challenges. The day concluded with student lightning talks and a brief synthesis session outlining priorities for the following day.

Day 2. Day 2 emphasized participation, inclusivity, and practical skill-building. Activities began with a research keynote on evaluating LLM systems, followed by a roundtable discussion dedicated to broadening participation in AI-related work. A combined lunch and poster session allowed students to present research and applied LLM projects. Afternoon sessions featured a

tutorial on LLM resources, a second round of student lightning talks, and closing remarks summarizing outcomes and next steps.

Across both days, the schedule integrated expert talks, peer-to-peer learning, and structured community interaction. This design created a cohesive workflow: participants first built shared conceptual grounding, then engaged in collaborative exploration, and finally synthesized insights through student contributions and reflective discussions. The progression supported diverse entry points into LLM-focused work and enabled sustained engagement across research, education, and application-oriented activities. More details can be found via <https://uvanlp.org/uva-llm-workshop/2024/>.

Student Engagement

Students played a central and multi-layered role in the workshop, contributing both to its organization and its scholarly activities. A dedicated student committee supported the event's execution, with students serving as co-chairs for lightning talks and poster sessions and as local organizing chairs, helping coordinate logistics, facilitate presenter communication, and ensure smooth operation across both days. In addition to these leadership roles, students were prominent contributors to the workshop program through lightning talks and poster presentations that showcased student-led projects applying LLMs to engineering challenges, educational innovation, and social-impact applications. These interactive sessions encouraged peer learning, fostered mentorship opportunities, and created space for student–faculty networking. Feedback indicated that the student-driven components were among the most engaging and informative elements of the workshop, highlighting the value of meaningful student involvement in both planning and scholarly exchange.

Technology-Enhanced Outreach

The workshop leveraged digital tools to enhance outreach and accessibility. The use of technology facilitated broader participation and supported the development of a lasting learning community. The workshop website served as a hub for information, registration, and post-event resources. All materials were shared via the workshop website, and recordings of key sessions were made available for asynchronous viewing. Tutorials introduced participants to open-source LLM platforms and resources, empowering attendees to continue learning and applying LLMs beyond the event. QR codes linked to surveys and materials, enabling seamless feedback collection and resource sharing. These strategies enhanced accessibility and broadened participation.

Evaluation and Lessons Learned

The purpose of this paper is not to evaluate participant learning outcomes, but to reflect on implementation-level insights that emerged while organizing and delivering an interdisciplinary, community-engaged workshop on large language models. These reflections are grounded in observations made by the organizing team during planning, facilitation, and follow-up, rather than in systematic assessment of participants' experiences.

Several implementation insights were particularly salient. First, scaffolding technical content across sessions was essential for supporting participants with varied disciplinary backgrounds and levels of familiarity with LLMs. Structuring the program to move from shared conceptual grounding toward application-oriented activities helped create common reference points while preserving flexibility for diverse interests.

Second, intentional space for cross-disciplinary interaction—including lightning talks, poster sessions, and facilitated discussions—proved critical for fostering connection among participants who might not otherwise interact. Designing multiple low-barrier entry points supported inclusive participation without requiring uniform technical expertise.

Finally, the workshop underscored the importance of organizational infrastructure—such as student leadership roles, communication channels, and digital resource sharing—in sustaining engagement beyond a single event. These elements function as enabling conditions for longer-term collaboration rather than as indicators of immediate participant impact.

While formal educational assessment was not the focus in this paper (in a different paper), the data analysis of participant feedback collected through surveys in [10] indicated strong engagement and perceived value. Attendees reported increased understanding of LLM technologies, appreciation for diverse applications, and interest in future community-oriented initiatives. The workshop also enhanced participants' sense of belonging to an emerging LLM education community.

Transferability

This LLM Workshop offers a replicable model for integrating emerging technologies into engineering education through community engagement and its format and materials are transferable. Its interdisciplinary structure, emphasis on inclusivity, and use of digital tools can be adapted by other institutions seeking to build similar communities around AI literacy and innovation. The workshop's success demonstrates the potential of academic events to serve as platforms for capacity building and sustained collaboration.

Conclusion

This case study demonstrates how an intentionally designed academic workshop can function as a community-engaged practice for integrating emerging technologies into engineering education. By foregrounding partnership development, interdisciplinary collaboration, and inclusive participation, the workshop offers a practical model for institutions seeking to cultivate AI literacy beyond individual courses or disciplines.

Rather than evaluating participant outcomes, this paper contributes by documenting how engagement was organized and enacted, highlighting design choices that supported collaboration among faculty, students, and community stakeholders. These insights may inform future efforts to build sustainable, community-connected infrastructures around rapidly evolving technologies. Together with complementary evaluative work examining participant learning and engagement [10], this practice-focused account underscores the value of aligning educational innovation with community-engagement principles, organizational support, and intentional design.

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