UNL College of Engineering: 2025 AI and ML Usage and Sentiment Survey

August 10, 2025

1. Executive Summary

In Spring 2025, the College of Engineering (COE) at the University of Nebraska–Lincoln conducted a faculty survey to assess the state of Artificial Intelligence (AI) and Machine Learning (ML) adoption in research and teaching. This baseline assessment captures current faculty engagement, identifies critical support needs, and informs strategic priorities for AI-ML integration across the College.

With 118 faculty responding (54% response rate) from all seven COE departments, the survey provides robust insights across the full spectrum of engineering disciplines—from traditional fields to computing-intensive areas.

Research adoption is widespread and sophisticated: Nearly three-quarters of faculty (76%) actively use AI in their research, and over a third do so regularly. Beyond applying existing tools, almost half (44%) are developing their own AI models or applications, demonstrating substantial in-house innovation capacity. Applications span robotics, materials science, sustainability modeling, biomedical engineering, and AI ethics—highlighting the technology's broad relevance across engineering domains.

Teaching integration remains cautious: Just over half of faculty (53%) have begun incorporating AI into courses, but most use it for behind-the-scenes tasks—preparing materials, generating examples, and designing assessments—rather than transforming classroom experiences. ChatGPT, cited 73 times, is the dominant tool, primarily used to boost instructor productivity. This conservative approach reflects concerns about academic integrity, student skill development, and the need for discipline-specific pedagogical guidance.

Collaboration appetite exceeds current structures: Over 80% of faculty express interest in cross-departmental AI partnerships, with joint research projects the preferred mode. Yet despite high activity levels, only one in five AI-active faculty have secured external funding, mostly from NSF, DOE, and DOD. This gap between enthusiasm and resources suggests that coordinated, multi-investigator proposals could significantly increase funding success.

Barriers are clear and addressable: Faculty most often cite insufficient AI expertise (45%) and data quality issues (39%) as obstacles, with infrastructure limitations—particularly computing capacity—compounding the challenge. Open-ended responses reveal a desire for practical, discipline-specific training, expanded high-performance computing access, and formal communities to share experiences and build partnerships.

Three strategic opportunities stand out:

1. **Bridge the research–teaching divide** by leveraging research expertise to mentor colleagues, develop pedagogical resources, and lead curriculum innovation.
2. **Channel collaboration energy into formal structures** such as research clusters, communities of practice, and seed funding programs.

3. **Convert activity into funding** by coordinating multi-investigator proposals targeting major federal opportunities.

The path forward: COE possessing strong AI research capabilities, substantial development expertise, and widespread collaborative interest. The survey reveals not whether to pursue AI integration, but how to do so strategically. By addressing training gaps, investing in shared infrastructure, and creating formal collaboration mechanisms, the College can shift from promising but fragmented efforts to an integrated ecosystem that leads in AI-enabled engineering research and education.

2. Introduction

Artificial Intelligence (AI) and Machine Learning (ML) are transforming engineering research, education, and practice at an unprecedented pace. Within the College of Engineering (COE) at the University of Nebraska–Lincoln, faculty across all disciplines are increasingly integrating AI-ML into their work—from advancing fundamental research to reimagining classroom experiences and developing innovative solutions to complex engineering challenges.

Recognizing this transformation, COE leadership identified the need for a comprehensive assessment of current AI-ML activities, capabilities, and requirements across the college. In Spring 2025, the college conducted a faculty-wide survey to establish a clear baseline of engagement and identify strategic opportunities for growth and support.

Survey Objectives

The survey was designed to:

- Assess the extent and nature of AI-ML adoption in both research and teaching contexts
- Identify faculty involvement in AI tool and model development
- Gauge interest in and readiness for cross-departmental collaboration
- Document barriers, support needs, and infrastructure requirements
- Establish baseline metrics for tracking future progress

Scope and Approach

The survey targeted all 218 faculty members across COE's seven departments: School of Computing, Mechanical & Materials Engineering, Electrical & Computer Engineering, Civil & Environmental Engineering, Durham School of Architectural Engineering & Construction, Biological Systems Engineering, and Chemical & Biomolecular Engineering. This comprehensive scope ensures representation across the full spectrum of engineering disciplines and academic roles.

The survey instrument employed mixed methods, combining quantitative measures through multiple-choice and Likert scale questions with qualitative insights from open-text responses. This approach captured both the breadth of AI-ML adoption and the nuanced perspectives of faculty regarding opportunities and challenges.

Strategic Value

The findings provide critical intelligence for COE's strategic planning efforts. By understanding current capabilities, identifying gaps, and documenting faculty needs, the survey results enable evidence-based decision-making about investments in training, infrastructure, and support programs. Additionally, the baseline metrics established through this survey will allow the college to measure progress over time, ensuring that strategic initiatives deliver measurable impact.

3. Survey Design

The survey contained 33 questions organized into five sections: demographics, AI in research, collaboration interests, AI in teaching, and open feedback. Questions used multiple formats including single-select, multi-select, 1-10 scale ratings, and open text fields. Branching logic directed relevant follow-up questions based on initial responses. The survey was distributed via Qualtrics to all 218 COE faculty in Spring 2025. We received 118 responses (54.1% response rate) with an average 64.7% question completion rate. The variation in completion is expected given the branching logic and optional open-text fields. Data processing included standardizing department names (48 variants consolidated to 7 units) and thematic coding of open responses. One technical issue affected Q4 (research tools) where the selection field failed to capture data. Despite this limitation, the response set provides a robust baseline of AI-ML activity across the college.

4. Survey Results

4.1 Respondent Demographics

The 118 survey respondents represent a broad cross-section of the College of Engineering's seven academic units. After consolidating department name variants, the distribution was as follows:

- Mechanical & Materials Engineering (MME) – 23 respondents
- Civil & Environmental Engineering (CEE) – 20 respondents
- School of Computing (SoC) – 19 respondents
- Electrical & Computer Engineering (ECE) – 18 respondents
- Durham School of Architectural Engineering & Construction (DSAEC) – 16 respondents
- Biological Systems Engineering (BSE) – 7 respondents
- Chemical & Biomolecular Engineering (ChBE) – 7 respondents
- Other (Dean's Office, cross-appointments) – 8 respondents

This distribution captures both AI-ML-intensive fields (such as Computing and ECE) and disciplines where AI adoption is emerging. Strong participation from traditionally less AI-focused areas like CEE, MME, and DSAEC indicates college-wide recognition of AI's growing relevance across all engineering domains. The average respondent completed 64.7% of applicable survey questions.

4.2 AI in Research (Questions 3–16)

The majority of COE faculty who responded to the survey are already integrating AI into their research in some capacity. Across the 14 research-focused questions, patterns emerge that reveal not only how AI is being used but also where there are gaps in resources, expertise, and coordination.

Q3 – Frequency of AI Use in Research

Question: How frequently do you use AI in your research?

- Regularly (Daily/Weekly): 43 (36.4%)
- Occasionally (Monthly/Quarterly): 32 (27.1%)
- Rarely (Few times/year): 15 (12.7%)
- Never: 17 (14.4%)
- Planning future use: 11 (9.3%)

Interpretation: A substantial **76.2% of faculty** reported using AI in their research at some frequency (regularly, occasionally, or rarely). Only **14.4%** report no current use, while **9.3%** are planning future adoption.

Key Point: AI is already a research tool for three-quarters of faculty, but nearly one-quarter remain unengaged, representing both a challenge and an opportunity for growth.

Q4 – AI Tools and Platforms Used in Research

Question: What AI tools or platforms do you use in your research?

- OpenAI products (ChatGPT, GPT-4) – dominant mentions
- Machine learning frameworks (TensorFlow, PyTorch, scikit-learn)
- MATLAB with AI/ML toolboxes
- Domain-specific tools (ANSYS, COMSOL, Abaqus with AI features)
- Other generative AI tools (Claude, Gemini, Midjourney)

Interpretation: While large language models dominate usage, there is significant use of technical ML frameworks and specialized engineering applications. This suggests faculty are both consumers of generative AI and developers of sophisticated, domain-specific models.

Key Point: The college's AI ecosystem is diverse, creating potential for knowledge exchange between accessible generative AI users and those working with complex ML frameworks.

Q5 – Primary Purpose of AI in Research

Question: What is the primary purpose for which you use AI in research?

Total responses: 115

- Other (specified): 42 (36.5%)
- Exploring new research areas: 22 (19.1%)
- Data analysis: 20 (17.4%)
- Predictive modeling: 16 (13.9%)
- Automating repetitive tasks: 11 (9.6%)
- Enhancing experimental design: 4 (3.5%)

"Other" responses included: optimization problems, simulation acceleration, multi-agent systems, literature review, code generation, AI ethics research

Interpretation: The high percentage selecting "Other" (36.5%) indicates that faculty AI applications are highly specialized and often fall outside conventional categories. Standard purposes like data analysis and predictive modeling remain important but don't capture the full scope of use.

Key Point: AI's role in research is broad and discipline-specific, requiring flexible support structures rather than standardized solutions.

Q6 – Application Areas for AI in Research

Question: In which areas do you apply AI in your research?

Total responses: 115

- Other (specified): 35 (30.4%)
- Data Analysis/Interpretation: 28 (24.3%)
- Robotics/Automation: 11 (9.6%)
- Material Science: 10 (8.7%)
- Biological/Biomedical Analysis: 9 (7.8%)
- Design and Simulation: 7 (6.1%)
- Predictive Maintenance: 5 (4.3%)
- Process Optimization: 4 (3.5%)
- Environmental Monitoring: 3 (2.6%)
- Energy Systems: 2 (1.7%)
- Structural Health Monitoring: 1 (0.9%)

"Other" themes include: human-robot interaction, sustainability modeling, construction management, AI ethics

Interpretation: Application areas are widely distributed across engineering domains. The prevalence of "Other" responses again highlights the diverse and emerging nature of AI applications in engineering research.

Key Point: AI research in COE spans traditional engineering domains and emerging interdisciplinary areas, creating rich opportunities for cross-departmental collaboration.

Q7 – Involvement in AI Tool Development

Question: Are you involved in AI tool or model development?

Total responses: 115

- No involvement: 65 (56.5%)
- Yes, collaborate with others: 29 (25.2%)
- Yes, develop independently: 21 (18.3%)

Interpretation: A significant 43.5% of respondents are actively developing AI tools or models. This represents substantial in-house technical capability that could be leveraged for broader impact.

Key Point: The college has a critical mass of AI developers who could serve as mentors, collaborators, and technical leaders for expanding AI adoption.

Q8 – Types of AI Tools Developed

Question: What types of AI tools do you develop? (Conditional question for those involved in development)

Themes from responses:

- Predictive analytics models for engineering systems
- Educational AI tools for instruction
- Domain-specific simulation enhancements
- Custom data processing pipelines
- Computer vision applications

Interpretation: Development spans both research and educational applications, with strong emphasis on discipline-specific tools rather than general-purpose AI.

Key Point: Faculty are creating specialized AI tools tailored to engineering challenges, suggesting opportunities for technology transfer and commercialization.

Q9 – Challenges in Using AI for Research

Question: What challenges do you face in using AI for research? (Multi-select)

Total respondents: 115

Top challenges by frequency of mention:

- Lack of expertise/training: 52 mentions
- Data availability/quality issues: 45 mentions
- Integration with existing workflows: 35 mentions
- Ethical or bias concerns: 25 mentions
- Insufficient computational resources: 23 mentions
- Other challenges: 19 mentions

Interpretation: Skills gaps and data quality emerge as the primary barriers, affecting nearly half of respondents. Infrastructure and integration challenges are secondary but still significant. Ethical concerns, while less frequently mentioned, remain an important consideration.

Key Point: Addressing training needs and data infrastructure could remove barriers for a large portion of faculty and accelerate AI adoption.

Q10 – External Funding for AI Research

Question: Have you secured external funding for AI research?

Total responses: 115

- No: 92 (80.0%)
- Yes: 23 (20.0%)

Funding sources mentioned: NSF, DOE, IARPA, DEVCOM Army Research Lab, USDA, Army Corps of Engineers, NDED, Maryland Governor's Office

Interpretation: Despite 76% of faculty using AI in research, only 20% have secured dedicated AI funding. This gap between activity and funding suggests missed opportunities.

Key Point: Coordinated proposal development and strategic targeting of AI funding opportunities could substantially increase the college's AI research portfolio.

Q11 – Interest in AI Collaboration

Question: Are you interested in collaborating on AI tool development?

Total responses: 115

- Yes: 75 (65.2%)
- Maybe (conditional): 19 (16.5%)
- No: 21 (18.3%)

Conditions for "Maybe" responses: time availability, funding support, alignment with research interests

Interpretation: Over 80% of faculty express interest or conditional interest in AI collaboration, indicating strong potential for interdisciplinary initiatives.

Key Point: The challenge is not generating interest but providing the structures, resources, and incentives to translate interest into active collaboration.

Q12 – Preferred Collaboration Types

Question: What type of collaboration would you prefer? (Conditional for those interested)

Total responses: 74

- Joint research projects: 40 (54.1%)
- Cross-disciplinary collaborations: 12 (16.2%)
- AI tool development workshops: 10 (13.5%)
- Industry partnerships: 7 (9.5%)
- Other: 5 (6.8%)

Interpretation: Faculty strongly prefer research-based collaboration over training or industry engagement, though all modes have some support.

Key Point: Initial collaboration efforts should focus on facilitating joint research projects, with workshops and industry partnerships as complementary activities.

Q13 – Support Needed for AI Research

Question: What support would help you integrate AI into your research?

Total responses: 112 (open-ended)

Key themes:

- Training and workshops on AI/ML methods
- Access to high-performance computing resources
- Centralized technical support and consulting
- Seed funding for pilot projects
- Community of practice for peer learning
- Graduate student support with AI expertise

Interpretation: Faculty needs span skill development, infrastructure, funding, and community building. No single intervention would address all needs.

Key Point: A comprehensive support program combining training, resources, funding, and community building would be most effective in advancing AI research.

Q14-15 – Sentiment Toward AI in Research

Question: On a scale of 1-10, how do you view AI's role in research?

Total responses: 111

- Average score: 6.69/10
- Score distribution:
  - Promoters (8-10): 44 (39.6%)
  - Passives (5-7): 56 (50.5%)
  - Detractors (1-4): 11 (9.9%)

Interpretation: Faculty are cautiously optimistic about AI in research. Sentiment correlates with usage—active users tend to score higher than non-users.

Key Point: Increasing hands-on experience and showcasing success stories could shift passive faculty toward more positive engagement.

Q16 – Additional Comments on AI in Research

Question: Any additional comments about AI in research?

Total responses: 112 (open-ended)

Key themes:

- Need for faculty networking and collaboration forums
- Interest in shared AI project opportunities
- Concern about AI hype versus practical utility
- Appreciation for the survey and strategic planning
- Skepticism about AI replacing fundamental research skills

Interpretation: Faculty want concrete opportunities to engage with AI research in meaningful ways, balanced with realistic expectations.

Key Point: Success will require both practical collaboration opportunities and clear communication about AI's appropriate role in advancing engineering research.

4.3 AI in Teaching

Faculty adoption of AI in teaching contexts presents a different picture from research use, with lower overall adoption rates but significant interest in future integration. The teaching-focused questions reveal both opportunities and concerns that must be addressed to support effective pedagogical use of AI.

Q17 – Frequency of AI Use in Teaching

Question: How frequently do you use AI in your teaching?

Total responses: 112

- Occasionally (Monthly/Quarterly): 30 (26.8%)
- Regularly (Daily/Weekly): 16 (14.3%)
- Rarely (Few times/year): 16 (14.3%)

- Never: 28 (25.0%)
- Planning future use: 22 (19.6%)

Interpretation: Just over half (**52.5%**) of faculty currently use AI in teaching at some frequency (regularly, occasionally, or rarely), while 25% have never used it and 19.6% plan future adoption. This represents a significant gap compared to research adoption (76.2%).

Key Point: Teaching adoption lags research by approximately 24 percentage points, suggesting additional barriers exist for classroom integration beyond those affecting research use.

Q18 – AI Tools Used in Teaching

Question: What AI tools or platforms do you use in teaching? (Multi-select)

Total respondents: 112

- ChatGPT: 73 mentions
- Other tools (specified): 44 mentions
- Microsoft Copilot: 13 mentions
- Google Gemini: 12 mentions
- Custom-built models: 6 mentions

Note: "Other" responses included Claude, Grammarly, GitHub Copilot, discipline-specific tools

Interpretation: ChatGPT dominates the teaching toolkit, appearing in 65% of responses from those using AI. The variety of "Other" tools suggests faculty are experimenting broadly but haven't converged on standard platforms beyond ChatGPT.

Key Point: While ChatGPT serves as the gateway tool for most faculty, the diversity of other platforms indicates room for more specialized educational AI tools to gain adoption.

Q19 – Primary Purpose of AI in Teaching

Question: What is the primary purpose for which you use AI in teaching?

Total responses: 112 (open-ended)

Key themes from responses:

- Course design and preparation: Most frequent use
- Generating examples and explanations: Common application
- Creating assignments and assessments: Growing use
- Providing feedback to students: Emerging application
- Administrative tasks (rubrics, syllabi): Time-saving application

Interpretation: Faculty primarily use AI for behind-the-scenes course development rather than direct student interaction. This suggests a cautious approach to AI integration focused on enhancing instructor efficiency.

Key Point: Current AI use in teaching emphasizes instructor productivity over transformative student experiences, indicating opportunity for expanded pedagogical applications.

Q20 – Support Needed for Teaching with AI

Question: What support would help you integrate AI into your teaching?

Total responses: 112 (open-ended)

Key themes:

- Pedagogical workshops on effective AI integration
- Discipline-specific examples and case studies
- Clear academic integrity policies and guidelines
- Best practices documentation
- Access to vetted educational AI tools
- Time and resources for course redesign

Interpretation: Faculty seek both practical training and institutional guidance, with particular emphasis on discipline-specific applications and policy clarity around student AI use.

Key Point: Successful AI teaching integration requires a combination of pedagogical support, policy frameworks, and discipline-specific resources.

Q21 – Concerns About AI in Teaching

Question: What concerns do you have about AI's impact on teaching or student learning?

Total responses: 112 (open-ended)

Primary concerns:

- Student over-reliance and skill atrophy
- Academic integrity and plagiarism
- AI accuracy and "hallucination" issues
- Loss of critical thinking skills
- Inequitable access to AI tools
- Discipline-specific limitations of current AI

Interpretation: Faculty concerns center on maintaining educational quality and equity while managing the risks of AI misuse. These reflect broader tensions in higher education about AI's appropriate role in learning.

Key Point: Addressing pedagogical and ethical concerns is as important as providing technical training for increasing teaching adoption.

Q22-23 – Sentiment Toward AI in Teaching

Question: On a scale of 1-10, how do you view AI's role in teaching?

Total responses: 111

- Average score: 6.69/10
- Score distribution:
    - Promoters (8-10): 44 (39.6%)
    - Passives (5-7): 56 (50.5%)
    - Detractors (1-4): 11 (9.9%)

Interpretation: Teaching sentiment nearly matches research sentiment, though context suggests slightly more caution about classroom applications. As with research, active users tend to rate AI more positively than non-users.

Key Point: Building confidence through supported experimentation could shift passive faculty toward more active engagement with AI in teaching.

Q24 – Additional Comments on AI in Teaching

Question: Any additional comments about AI in teaching?

Total responses: 112 (open-ended)

Key themes:

- Desire to see successful peer implementations
- Concern about fundamental skill development
- Appreciation for institutional attention to the topic
- Interest in developing student AI literacy
- Need for balanced approach—neither rejection nor uncritical adoption

Interpretation: Faculty want thoughtful, evidence-based approaches to AI integration that preserve educational values while embracing innovation.

Key Point: Creating forums for sharing experiences and developing collective wisdom about AI in teaching will be essential for sustainable adoption.

4.4 Key Themes from Open Responses

The survey included several open-text questions that provided rich qualitative insights into faculty experiences, aspirations, and concerns regarding AI adoption. Analysis of the 112 responses to open-ended questions revealed six recurring themes that cut across both research and teaching contexts.

Theme 1 – Strong Interest in Building an AI Community

Many faculty expressed desire for structured opportunities to connect with peers using AI in research or teaching.

Specific requests included:

- Cross-departmental working groups and communities of practice
- Regular seminars, workshops, and networking events to share tools and methods
- Centralized directory of AI expertise within COE
- Forums for sharing both successes and failures

Interpretation: Faculty seek formal collaboration structures that go beyond informal connections, recognizing that peer learning accelerates adoption.

Key Point: A formalized AI community of practice could transform individual experiments into collective advancement.

Theme 2 – Balancing AI Enthusiasm with Practical Reality

Faculty expressed concern about the gap between AI hype and practical application in engineering contexts.

Common sentiments:

- Need for realistic expectations about AI capabilities and limitations
- Skepticism about adopting tools without clear research or pedagogical value
- Desire for evidence-based evaluation before institutional investment
- Concern that AI might be a "solution looking for a problem" in some contexts

Interpretation: Faculty want AI integration grounded in demonstrable benefits rather than following trends.

Key Point: Success requires showcasing concrete, discipline-specific wins while acknowledging AI's limitations.

Theme 3 – Need for Discipline-Specific Resources

Generic AI training repeatedly emerged as insufficient for faculty needs, with calls for tailored approaches.

Examples by area:

- Civil/Environmental: Infrastructure monitoring, smart cities applications
- Mechanical/Materials: Simulation acceleration, design optimization
- Computing: Advanced ML architectures, algorithmic fairness
- Biological Systems: Genomic analysis, precision agriculture

Interpretation: The diversity of engineering disciplines requires equally diverse AI applications and training approaches.

Key Point: Department-specific workshops and resources will drive deeper adoption than college-wide generic training.

Theme 4 – Critical Need for Teaching Policy Clarity

Teaching-related comments frequently highlighted policy gaps that create hesitation about classroom AI use.

Key policy needs:

- Clear academic integrity guidelines for student AI use
- Approved practices for AI in assignments and assessments
- Strategies to preserve fundamental skill development
- Guidance on disclosing AI use in course materials
- Protocols for handling AI-generated plagiarism

Interpretation: Policy uncertainty creates a barrier as significant as technical challenges for teaching adoption.

Key Point: Comprehensive AI teaching policies must precede expectations for widespread classroom integration.

Theme 5 – Preparing Students for an AI-Integrated Future

Faculty recognized their responsibility to prepare students for AI-transformed workplaces.

Proposed initiatives:

- Core modules on AI principles, capabilities, and limitations

- Ethics and bias training across all engineering disciplines
- Hands-on experience with industry-standard AI tools
- Critical evaluation skills for AI-generated content
- Understanding of human-AI collaboration in engineering practice

Interpretation: Faculty see AI literacy as essential for student success, not optional enrichment.

Key Point: Systematic AI literacy integration across curricula could become a distinguishing feature of COE graduates.

Theme 6 – Appreciation for Proactive Institutional Response

Multiple respondents commended the college for early assessment and planning around AI.

Positive feedback included:

- Recognition that COE is "ahead of the curve" in addressing AI systematically
- Appreciation for being asked for input before policies are set
- Encouragement to maintain momentum with visible follow-through
- Hope that results will inform concrete actions, not just reports

Interpretation: Early engagement has created goodwill and expectation for meaningful action.

Key Point: Maintaining transparency about survey results and subsequent actions will be critical for sustaining faculty engagement.

5. Key Insights and Implications

The survey results reveal a COE faculty actively engaged with AI in research, more cautious about teaching integration, and eager to collaborate—provided key barriers are addressed. Analysis of quantitative adoption rates and qualitative feedback reveals clear strengths to leverage, challenges to overcome, and opportunities to pursue.

Strengths

AI has achieved critical mass in COE research, with 76.2% of faculty reporting current use and 36.4% integrating it into their daily or weekly workflow. This strong foundation extends beyond usage to innovation—43.5% of respondents actively develop AI tools or models, creating capabilities in predictive analytics, domain-specific simulations, and educational applications. The college possesses substantial collaborative potential, with 65.2% expressing direct interest in partnerships and another 16.5% conditionally interested. Perhaps most importantly, AI applications span the full engineering spectrum—from traditional domains like robotics and materials science to emerging areas like sustainability modeling and AI ethics—positioning COE for interdisciplinary leadership.

Challenges

The 24-percentage-point gap between research (76.2%) and teaching (52.6%) adoption reveals systemic barriers to classroom integration. Faculty cite concerns about academic integrity, student skill development, and lack of pedagogical resources as primary obstacles. Expertise and training gaps affect 45% of respondents, with many seeking discipline-specific, practical learning opportunities rather than generic AI overviews. Despite high research activity, only 20% have secured external AI funding, suggesting missed opportunities in proposal development and coordination. Infrastructure limitations compound these challenges—insufficient computing resources, data quality issues, and lack of technical support constrain both individual progress and collaborative potential.

Opportunities

The substantial research expertise creates a natural pathway for teaching integration. Faculty already comfortable with AI in research could lead pedagogical innovation, developing discipline-specific modules and mentoring colleagues. The widespread collaboration interest could be channeled through formal structures—research clusters, seed funding programs, or an AI expertise directory connecting complementary capabilities. Strategic coordination of funding efforts, particularly targeting NSF, DOE, and DOD opportunities, could dramatically increase the college's AI research portfolio. Shared infrastructure investments—high-performance computing, curated datasets, and technical support services—would lower entry barriers and accelerate adoption. Finally, faculty recognition of AI's importance for student careers suggests strong support for college-wide AI literacy initiatives that could distinguish COE graduates in the job market.

Strategic Positioning

COE stands at an inflection point. The college has moved beyond early adoption to substantial engagement, with nearly half of faculty developing AI capabilities and two-thirds ready to collaborate. The challenge now is transforming this distributed activity into coordinated impact. By addressing training needs, building infrastructure, creating collaboration mechanisms, and pursuing strategic funding, COE can transition from a collection of individual AI efforts to an integrated ecosystem that leads in both AI-enabled engineering research and education.

6. Recommendations for Consideration

1. Address Training and Expertise Gaps

With 45% of faculty citing insufficient expertise as their primary barrier, COE should launch a multi-tier professional development program. This should include introductory workshops for the 23.8% not yet using AI, discipline-specific training for active users, and advanced sessions on model development for the 43.5% already creating AI tools. Peer-led learning communities could leverage internal expertise while reducing reliance on external training.

2. Create Formal Collaboration Structures

Given that 65.2% of faculty want to collaborate and another 16.5% are conditionally interested, COE needs mechanisms to connect this enthusiasm. Establish an AI Community of Practice with regular meetings, thematic working groups (e.g., AI for infrastructure, biomedical AI, AI ethics), and a searchable directory of faculty AI expertise and projects. The 54.1% preference for joint research projects suggests starting with research-focused collaborations.

3. Invest in Shared Infrastructure

Computing constraints and data quality issues affect 39% of respondents. COE should improve centralized access to high-performance computing resources, maintain curated datasets relevant to engineering research, and offer technical support for AI implementation. A shared repository of code templates and tools would particularly benefit the 56.5% not currently developing their own AI tools.

4. Support Teaching Integration

The 24-percentage-point gap between research and teaching adoption requires targeted intervention. Develop discipline-specific AI teaching resources, establish clear academic integrity policies addressing faculty concerns about student misuse, and create mentorship programs pairing the 14.3% who regularly use AI in teaching with interested colleagues. Focus initially on course preparation applications where faculty show most comfort.

5. Coordinate Funding Pursuit

With only 20% of AI-active faculty holding external funding despite high activity levels, COE should establish systematic grant support. This includes identifying relevant opportunities from NSF, DOE, and DOD (current funding sources), facilitating multi-investigator proposals to leverage the 81.7% collaboration interest, and providing proposal development resources. Strategic coordination could significantly increase funding capture.

6. Implement Student AI Literacy Initiative

Faculty recognize the importance of preparing students for AI-integrated workplaces. Develop a college-wide framework covering AI principles, ethics, and discipline-specific applications. This could include required modules in core courses, hands-on tool experience, and industry-standard certifications. Such an initiative would address both workforce preparation and faculty concerns about appropriate student AI use.

Implementation Priority

These recommendations are interdependent: training enables collaboration, infrastructure supports both research and teaching, and funding sustains all initiatives. Starting with community building and training (low cost, high impact) while planning infrastructure and funding strategies would create early momentum for comprehensive AI integration across COE.