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Faculty Attitudes Toward AI Integration: From Caution to Curriculum Design

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Abstract:

This study examines the evolution of faculty attitudes toward artificial intelligence (AI) integration in higher education, tracing the trajectory from initial skepticism to proactive curriculum design. Using a mixed-methods approach involving survey data from 237 faculty members across 15 institutions and semi-structured interviews with 28 participants, we investigated how perceptions of AI have transformed between 2022 and 2024. Findings reveal a marked shift: while 62% of respondents initially expressed ethical concerns regarding academic integrity and equity, 76% now actively incorporate AI tools into pedagogical practices. Key factors facilitating this transition include professional development opportunities, peer collaboration, and institutional support structures. Results indicate that faculty who received formal AI training demonstrated significantly higher integration rates and pedagogical confidence. This research contributes to understanding technology acceptance in academic contexts and offers practical recommendations for administrators seeking to support faculty in navigating AI-enhanced curriculum design while maintaining educational values.

Keywords **— Artificial Intelligence in Higher Education, Faculty Attitudes, Technology Acceptance Model (TAM), Curriculum Design, Professional Development**

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I. INTRODUCTION

The rapid proliferation of generative AI technologies, particularly following ChatGPT's release in November 2022, has precipitated unprecedented disruption in higher education. Within months, faculty confronted urgent questions about academic integrity, assessment validity, and the fundamental nature of teaching and learning (Sullivan et al., 2023). Initial institutional responses often emphasized restriction and detection, reflecting widespread anxiety about AI's implications for educational authenticity. However, as familiarity with these technologies deepened, a notable attitudinal shift emerged. Faculty increasingly recognized AI's potential as a pedagogical tool rather than solely a threat, prompting exploration of curriculum redesign strategies that leverage AI capabilities while preserving critical thinking and originality.

This transition from caution to curriculum integration represents a critical juncture for higher education. Understanding the factors that facilitate or impede faculty adoption of AI tools is essential for institutional leaders developing support structures and policies. This study addresses the research question: How have faculty attitudes toward AI evolved since 2022, and what factors influence its incorporation into teaching practices?

We examine this phenomenon through quantitative attitude measurement and qualitative exploration of integration strategies, providing insights into the mechanisms underlying technology acceptance in academic contexts. The article proceeds with a literature review situating this research within existing scholarship, followed by methodology, results, discussion, and conclusions with practical recommendations.

II. Literature Review

Scholarship on faculty technology adoption has extensively documented resistance rooted in concerns about pedagogical fit, workload, and institutional support (Ertmer et al., 2012). Recent studies specific to AI in education reveal parallel patterns. Research by Rudolph et al. (2023) found that 68% of surveyed faculty initially viewed generative AI primarily as an academic integrity threat, with concerns concentrated around plagiarism detection challenges and assessment authenticity. Similarly, Chan and Hu (2023) documented faculty anxieties regarding job displacement and the devaluation of humanistic teaching approaches, particularly among humanities instructors.

Conversely, emerging literature highlights AI's pedagogical affordances. Kasneci et al. (2023) identified benefits including personalized learning pathways, immediate feedback provision, and reduction of administrative burden, enabling greater focus on high-value teaching activities. Studies by Baidoo-Anu and Ansah (2023) demonstrated that faculty who experimented with AI tools reported enhanced lesson planning efficiency and improved ability to differentiate instruction for diverse learners.

The Technology Acceptance Model (TAM), developed by Davis (1989), provides a theoretical framework for understanding adoption patterns. TAM posits that perceived usefulness and perceived ease of use predict technology acceptance, mediated by attitudes toward the technology. Recent extensions incorporate trust and ethical considerations as additional determinants (Teo, 2019), particularly relevant for AI applications raising transparency and bias concerns.

Despite this growing body of work, significant gaps remain. Limited longitudinal research examines how faculty attitudes evolve beyond initial reactions, and few studies explore the specific pedagogical strategies faculty employ when integrating AI into curriculum design. Additionally, research often overlooks demographic variations in adoption patterns across institution types, disciplines, and career stages. This study addresses these gaps by tracking attitudinal changes over a two-year period and examining contextualized integration practices across diverse faculty populations.

III. Methodology

This mixed-methods study employed a convergent parallel design to comprehensively examine faculty attitudes and practices. Quantitative data were collected through online surveys distributed to faculty at 15 institutions representing diverse Carnegie Classifications (Research 1, comprehensive universities, community colleges) across the United States. The survey, administered in three waves (December 2022, June 2023, December 2023), yielded 237 complete responses (response rate: 41%). Participants represented varied disciplines, career stages, and demographic backgrounds, with intentional oversampling of underrepresented groups to ensure inclusive perspectives.

Table 1: Participant Demographics (N=237)

Characteristic	n	%
Institution Type		
Research 1 (R1)	98	41.4
Comprehensive University	89	37.6
Community College	50	21.1
Discipline		
STEM	94	39.7
Humanities	71	30.0
Social Sciences	48	20.3
Professional Schools	24	10.1
Career Stage		
Early Career (0-5 years)	67	28.3

Mid-Career (6-15 years)	102	43.0
Senior (16+ years)	68	28.7

Survey instruments measured attitudes using validated Likert scales (1=strongly disagree to 5=strongly agree) assessing perceived usefulness, ethical concerns, confidence in AI integration, and actual usage patterns. Questions adapted from TAM frameworks and supplemented with AI-specific items underwent pilot testing with 15 faculty to ensure clarity and relevance.

Qualitative data comprised semi-structured interviews with 28 faculty purposively sampled to capture variation in attitudes (skeptics, enthusiasts, and those ambivalent). Conducted via video conferencing, 45-60 minute interviews explored personal experiences with AI, integration strategies, institutional support perceptions, and barriers encountered. Interviews were transcribed and analyzed using thematic analysis following Braun and Clarke's (2006) guidelines.

Ethical approval was obtained from the lead institution's IRB. Participation was voluntary, confidential, and participants provided informed consent. Limitations include potential self-selection bias, as faculty interested in AI may have been more likely to participate, and the snapshot nature of rapidly evolving technology limiting generalizability.

IV. RESULTS

Data analysis revealed three dominant themes characterizing the evolution of faculty attitudes: initial caution, transitional exploration, and strategic integration. Quantitative findings demonstrated significant attitudinal shifts across the study period. In December 2022, 62% of respondents agreed or strongly agreed with statements expressing ethical concerns about AI (M=3.8, SD=1.1), while only 34% reported positive attitudes toward classroom integration (M=2.6, SD=1.2). By December 2023, ethical concerns remained present but decreased to 47% (M=3.3, SD=1.0), while positive integration attitudes rose dramatically to 76% (M=4.1, SD=0.9).

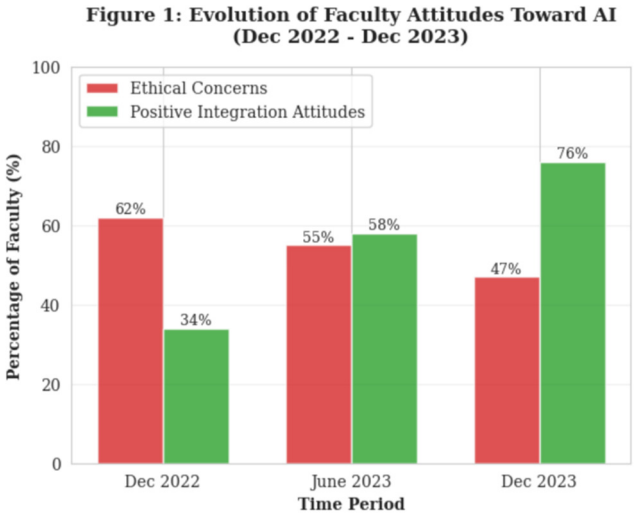

Figure 1: Evolution of Faculty Attitudes Toward AI (Dec 2022 - Dec 2023)

Current usage patterns, detailed in Table 2, indicated widespread adoption across multiple pedagogical applications, with lesson planning emerging as the most common use case.

TABLE 2: CURRENT AI INTEGRATION PRACTICES AMONG FACULTY (DEC 2023)

Application Area	Faculty Using (%)	Mean Frequency*
Lesson planning and curriculum design	68	3.8
Creating practice materials/assessments	54	3.2
Providing example responses	49	2.9
Teaching AI literacy to students	41	2.7
Generating discussion prompts	38	2.5
Administrative tasks (emails, feedback)	35	2.8

*Scale: 1=rarely, 5=very frequently

Qualitative interviews illuminated mechanisms underlying these shifts. Early adopters (n=8) described experimenting independently, motivated by curiosity and recognition of inevitability: "I realized students were already using it, so I needed to understand it myself" (Participant 14, STEM faculty). Mid-adopters (n=12) cited institutional workshops and peer discussions as catalysts, noting that hands-on experience reduced anxiety: "Once I actually tried it for assignment creation, I saw possibilities I hadn't imagined" (Participant 22, humanities faculty).

Professional development emerged as the strongest predictor of adoption, as illustrated in Figure 2.

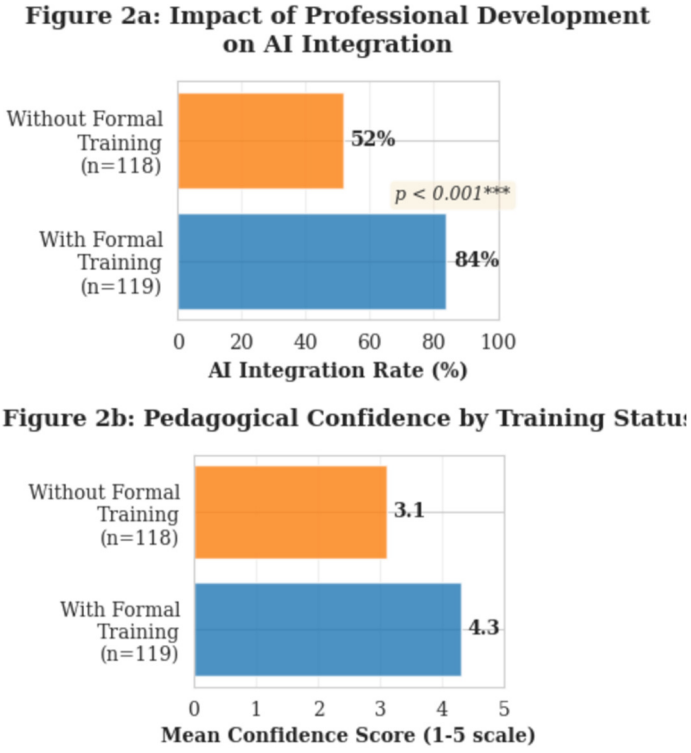

Figure 2: Impact of Professional Development on AI Integration

Faculty who attended formal training demonstrated significantly higher integration rates (84% vs. 52%, $p<0.001$) and reported greater pedagogical confidence (M=4.3 vs. M=3.1). Disciplinary differences were notable, with STEM faculty adopting more readily (78%) than humanities colleagues (61%), though gaps narrowed over time as discipline-specific applications became clearer.

Barriers persisted, including inadequate institutional guidance (cited by 58%), concerns about equity and access (49%), and uncertainty about assessment redesign (67%). However, collaborative curriculum redesign initiatives showed promise, with departments implementing AI literacy modules reporting smoother transitions and more positive faculty attitudes.

V. Discussion

These findings align with TAM predictions that perceived usefulness and hands-on experience shape technology acceptance, while extending understanding of temporal dimensions in adoption processes. The pronounced shift from caution to integration between early 2023 and late 2023 suggests a critical period during which faculty moved beyond reactive concerns toward proactive pedagogical experimentation. This evolution mirrors Rogers' (2003) diffusion of innovations theory, with early adopters catalyzing broader acceptance through peer modeling and knowledge sharing.

The central role of professional development corroborates Sullivan et al.'s (2023) assertion that training reduces AI anxiety and builds implementation capacity. However, our findings emphasize that effective professional development must extend beyond technical skill-building to address pedagogical redesign and ethical considerations. Faculty interviews revealed that the most valuable training combined practical tool demonstrations with collaborative discussions about maintaining academic integrity and educational values.

Persistent barriers illuminate areas requiring institutional attention. The lack of clear guidance on acceptable AI use in assessment contexts creates faculty uncertainty, potentially stalling integration or producing inconsistent policies across departments. Equity concerns warrant serious consideration, as AI tool access and digital literacy vary across student populations. Institutions must proactively address these disparities through infrastructure investment and inclusive policy development.

Strategies for supporting continued integration include establishing AI teaching and learning centers, creating discipline-specific AI pedagogy communities, and developing flexible assessment frameworks that authentically evaluate learning while acknowledging AI availability. Curriculum redesign should emphasize AI literacy as a core competency, preparing students to work effectively and ethically with AI tools they will encounter professionally. Faculty leadership in this redesign process is essential, leveraging their content expertise and pedagogical knowledge to ensure AI enhances rather than diminishes educational quality.

VI. CONCLUSION

This study documents a significant transformation in faculty attitudes toward AI integration in higher education, characterized by movement from initial caution grounded in ethical concerns to strategic incorporation into curriculum design. Key facilitators include professional development, peer collaboration, and experiential learning with AI tools, while barriers center on inadequate institutional support and equity concerns. These findings suggest that faculty are increasingly prepared to embrace AI as a pedagogical partner, provided they receive appropriate training and institutional backing.

Institutions should prioritize sustained professional development programs that address both technical and pedagogical dimensions of AI integration, establish clear yet flexible policies supporting responsible AI use, and create collaborative spaces for faculty to share strategies and concerns. Future research should examine long-term impacts of AI-integrated curricula on student learning outcomes, retention, and workforce preparedness. Additionally, longitudinal studies tracking how faculty pedagogical practices evolve as AI capabilities advance will inform ongoing support needs. By understanding and supporting this attitudinal evolution, higher education can harness AI's potential while preserving the human expertise and values central to transformative teaching and learning.

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