



BRIDGING INNOVATION AND EDUCATION: FACULTY PERSPECTIVES ON AI INTEGRATION IN HIGHER EDUCATION

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Abstract:

The rapid advancement of Artificial Intelligence (AI) has significantly influenced higher education institutions worldwide, reshaping teaching, assessment, research, and administrative practices. This empirical study examined faculty perceptions regarding the current state of AI utilization and integration in higher education institutions, with particular emphasis on institutional adoption levels, functional application areas, strategic goals, and supporting factors. Using a structured questionnaire, data were collected from 91 faculty members across different institutions and analysed through descriptive statistics and inferential techniques, including mean analysis and one-way ANOVA.

The findings revealed that AI integration was most prominent in teaching and assessment activities, followed closely by research and administration, indicating a balanced yet instructional-oriented adoption pattern. Most faculty perceived their institutions to be in the emerging or developing stages of AI adoption, reflecting gradual and evolving integration. Virtual assistants and predictive modelling emerged as the most frequently used AI applications, while innovation was identified as the primary institutional driver for AI adoption. Institutional support and student demand were recognized as key facilitators.

Gender-based analysis indicated moderately neutral to slightly positive perceptions across all dimensions of AI utilization, with no statistically significant differences observed among male, female, and undisclosed gender groups. The results underscore that faculty perceptions of AI integration are largely uniform, irrespective of gender, highlighting shared institutional experiences and challenges.

Thus, the study concludes that while AI adoption in higher education is progressing steadily, it remains developmental in nature and strongly dependent on institutional support structures. The findings offer valuable insights for policymakers, institutional leaders, and educators seeking to strategically enhance AI integration while preserving pedagogical alignment and academic values.

Keywords: Artificial Intelligence, Higher Education, Faculty Perceptions, AI Integration, Institutional Adoption, Empirical Study

INTRODUCTION

Artificial intelligence has increasingly become a significant driver of change in higher education, reshaping teaching practices, evaluation processes, and institutional operations. Higher education institutions are progressively implementing AI-enabled solutions such as learning analytics systems, plagiarism detection tools, virtual assistants, and predictive technologies to improve academic delivery and operational efficiency. Nevertheless, the effectiveness of these initiatives is closely linked to the degree of faculty acceptance, institutional preparedness, and the alignment of AI initiatives with core academic goals.

Faculty members occupy a pivotal position in transforming AI technologies into practical and meaningful educational applications. Their views on institutional encouragement, access to adequate resources, and the presence of a clear strategic vision strongly influence how effectively AI is adopted in academic environments. Although technological developments offer expanded instructional opportunities, faculty members continue to raise concerns regarding governance structures, clarity of AI-related policies, and the integration of AI within established pedagogical frameworks.

While interest in AI adoption within higher education is growing, empirical research that specifically examines faculty perspectives across diverse institutional settings remains

relatively scarce. Addressing this gap, the present study investigates faculty perceptions of the current status of AI utilization and integration in higher education institutions, focusing on levels of adoption, areas of application, institutional objectives, and the role of gender in shaping these perceptions.

Research Objectives

1. To assess faculty perceptions of the current level and areas of AI utilization in higher education institutions.
2. To examine whether faculty perceptions of AI integration differ significantly based on gender.
3. To identify key institutional drivers and supporting factors influencing AI adoption.

Research Significance

This research adds empirical value to the expanding scholarship on artificial intelligence in higher education by centring on faculty perceptions, a stakeholder group that remains comparatively underrepresented in existing studies. By examining patterns of AI adoption, key institutional motivations, and the consistency of perceptions across gender groups, the study provides data-driven insights relevant to academic leadership and policy formulation. The results assist institutions in making informed choices related to strategic AI implementation, capacity-building programs for faculty, and effective allocation of resources, thereby supporting a more sustainable, inclusive, and pedagogically aligned integration of AI within higher education systems.

REVIEW OF LITERATURE

Mah and Groß (2024) demonstrated that faculty members' confidence in using AI and access to structured professional development significantly shape AI adoption, leading to identifiable patterns of usage among educators. Similarly, Rahiman and Kodikal (2024) highlighted the capacity of AI to support individualized learning and improve instructional effectiveness, while stressing that successful implementation depends on adequate faculty training and institutional preparedness.

Empirical findings from Indian higher education institutions by Sharma et al. (2024) revealed that AI adoption remains at a moderate level and is strongly influenced by infrastructural

availability and organizational support. McGrath et al. (2023) examined ethical responsibility in AI usage and found that faculty members express considerable concern regarding accountability, transparency, and the preservation of academic integrity.

Adopting a systems-oriented view, Katsamakas et al. (2024) argued that meaningful AI integration requires synchronized alignment between technological capabilities, governance structures, and institutional culture. Kuleto et al. (2021) further identified key benefits of AI, such as improved efficiency and decision-making, alongside persistent challenges including financial constraints, skill shortages, and resistance to change. Bucea-Manea-Țoniș et al. (2022) emphasized that strategic institutional planning and active faculty involvement are critical for fostering effective AI-enhanced learning environments.

More recent research by Khlaif et al. (2024) and Alnasib (2023) focused on generative AI tools and faculty readiness, highlighting perceived usefulness, ethical awareness, and organizational encouragement as central drivers of adoption. Additionally, Fuchs and Aguilos (2023) underscored that transparent institutional policies and mutual trust among stakeholders are essential conditions for the successful and responsible integration of AI in higher education

Research Gap

Although existing research has explored issues related to AI adoption, faculty readiness, and ethical considerations in higher education, there remains a lack of focused empirical investigation into how faculty perceive institutional AI utilization across key functional areas such as teaching, assessment, research, and administration. Moreover, limited attention has been given to examining whether these perceptions vary across demographic groups. Addressing this gap, the present study empirically analyses faculty perceptions of the current state of AI integration within higher education institutions and evaluates the extent to which gender influences these perceptions, thereby contributing nuanced insights to the discourse on inclusive and evidence-based AI adoption.

RESEARCH METHODOLOGY

The study adopted a descriptive and analytical research design. Primary data is collected using a structured questionnaire administered to 91 faculty members from higher education institutions. The instrument measures perceptions related to AI utilization areas, institutional adoption levels, strategic alignment, and supporting factors. Descriptive statistics

(frequency, percentage, mean, and standard deviation) are used to summarize responses, while one-way ANOVA tested gender-based differences in faculty perceptions. The analysis is conducted using appropriate statistical tools to ensure reliability and validity of findings.

Data Analysis

Table 1: Frequency and Percentage Analysis of AI Usage

Variable	Category	Frequency	Percent
Which area has witnessed the highest integration of AI tools	Administration	20	22
	Teaching	27	29.7
	Research	21	23.1
	Assessment	23	25.3
What best describes your institution's current level of AI adoption	Emerging	25	27.5
	Developing	29	31.9
	Established	22	24.2
	Advanced	15	16.5
Which AI application is most frequently used in your institution	Learning analytics	16	17.6
	Plagiarism detection	16	17.6
	Virtual assistants	33	36.3
	Predictive modeling	26	28.6
What is the primary institutional goal of AI integration	Efficiency	19	20.9
	Innovation	35	38.5
	Competitiveness	18	19.8
	Standardization	19	20.9
Which factor best supports the adoption of AI	Institutional support	30	33
	Faculty readiness	15	16.5
	Student demand	27	29.7
	Regulatory policies	19	20.9

Table 1 presents the frequency and percentage analysis of AI usage patterns and institutional adoption characteristics as perceived by faculty members. The findings indicate that teaching has witnessed the highest integration of AI tools (29.7%), followed by assessment (25.3%), research (23.1%), and administration (22.0%), suggesting that AI adoption is relatively balanced across functional areas, with a slightly stronger emphasis on instructional and evaluative activities.

Regarding the overall level of AI adoption, a majority of respondents perceive their institutions to be in the developing (31.9%) or emerging (27.5%) stages, while fewer institutions are viewed as established (24.2%) or advanced (16.5%), indicating that AI integration is still evolving in most higher education settings.

In terms of specific applications, virtual assistants are identified as the most frequently used AI tools (36.3%), reflecting their

growing role in academic support and administrative communication. This is followed by predictive modelling (28.6%), while learning analytics and plagiarism detection are reported equally at 17.6% each. When examining institutional goals, innovation emerges as the primary driver of AI integration (38.5%), highlighting a strategic focus on modernization and competitive advancement. Efficiency (20.9%), standardization (20.9%), and competitiveness (19.8%) also play notable roles.

Finally, institutional support is perceived as the most critical factor facilitating AI adoption (33.0%), followed by student demand (29.7%), underscoring the importance of organizational commitment and learner expectations in advancing AI initiatives.

To find the significant difference in faculty perceptions of institutional AI utilization based on gender following hypothesis is framed;

H₀₁: “There is no significant difference in faculty perceptions of institutional AI utilization based on gender”.

H_{A1}: “There is a significant difference in faculty perceptions of institutional AI utilization based on gender”.

Table 2: Mean table for faculty for current state of AI utilization and integration

Gender		“My institution actively promotes the use of AI in teaching and administration”.	Adequate resources are available for implementing AI tools.	Faculty members are encouraged to experiment with AI-based teaching methods.	My institution has a clear strategy or roadmap for AI integration.	The use of AI aligns with the institution’s academic goals.
Male	Mean	2.77	2.49	2.51	2.55	2.47
	N	53	53	53	53	53
	Std. Deviation	1.031	1.012	1.067	1.170	1.103
Female	Mean	2.69	2.69	2.38	2.54	2.69
	N	26	26	26	26	26
	Std. Deviation	1.087	1.158	1.134	1.208	1.087
Prefer not to say	Mean	2.75	2.42	2.25	2.17	2.25
	N	12	12	12	12	12
	Std. Deviation	1.055	.900	1.138	.835	1.055
Total	Mean	2.75	2.54	2.44	2.49	2.51
	N	91	91	91	91	91
	Std. Deviation	1.039	1.036	1.087	1.139	1.089

Table 2 presents the mean scores of faculty perceptions regarding the current state of AI utilization and integration across different gender groups. The mean values for all five

statements range between 2.44 and 2.75, indicating a moderately neutral to slightly positive perception of institutional AI initiatives among faculty members. Male faculty members

report marginally higher mean scores for most dimensions, particularly in perceptions of institutional promotion of AI use and encouragement to experiment with AI-based teaching methods. Female faculty members show comparatively higher mean scores for the availability of adequate resources and alignment of AI use with institutional academic goals, suggesting slightly stronger confidence in these areas. Faculty who preferred not to disclose their gender generally report lower mean values, especially regarding the existence of a clear AI strategy or roadmap.

The close proximity of mean scores across gender categories suggests that faculty perceptions of AI utilization and integration are largely similar, with only minor variations observed across specific aspects. The results indicate that, regardless of gender, faculty members share comparable views on institutional support, strategic direction, and alignment of AI with academic objectives. These descriptive findings provide a preliminary indication that gender-based differences in perceptions may be limited, which is further examined through inferential analysis in subsequent sections to test the stated hypotheses.

Table 3: ANOVA table for faculty for current state of AI utilization and integration

ANOVA Table						
		Sum of Squares	df	Mean Square	F	Sig.
“My institution actively promotes the use of AI in teaching and administration”. * Gender	Between Groups	.115	2	.058	.052	.949
	Within Groups	97.071	88	1.103		
	Total	97.187	90			
Adequate resources are available for implementing AI tools. * Gender	Between Groups	.915	2	.457	.421	.658
	Within Groups	95.700	88	1.088		
	Total	96.615	90			
Faculty members are encouraged to experiment with AI-based teaching methods. * Gender	Between Groups	.768	2	.384	.320	.727
	Within Groups	105.649	88	1.201		
	Total	106.418	90			
My institution has a clear strategy or roadmap for AI integration. * Gender	Between Groups	1.487	2	.743	.568	.569
	Within Groups	115.260	88	1.310		
	Total	116.747	90			
The use of AI aligns with the institution’s academic goals. * Gender	Between Groups	1.751	2	.876	.734	.483
	Within Groups	104.996	88	1.193		
	Total	106.747	90			

Table 3 presents the ANOVA results examining whether faculty perceptions of the current state of AI utilization and integration differ significantly based on gender. The findings show that for all five dimensions analysed—promotion of AI use, availability of resources, encouragement to experiment with AI-based teaching methods, existence of a clear AI strategy, and alignment of AI with institutional academic goals—the significance (Sig.) values are well above the 0.05 level. This indicates that there are no statistically significant differences in

faculty perceptions across gender groups for any of the examined aspects.

The very low F-values further support the absence of meaningful variation between male, female, and undisclosed gender groups in their perceptions of institutional AI initiatives. These results suggest that faculty members, regardless of gender, share broadly similar views on how AI is promoted, supported, and aligned with academic objectives within their institutions. Consequently, the null hypothesis (H01) is accepted and the

alternative hypothesis (HA1) is rejected. “The findings imply that gender does not play a significant role in shaping faculty perceptions of institutional AI utilization and integration”.

CONCLUSION

The study concluded that AI utilization in higher education institutions is steadily progressing, with teaching and assessment emerging as the most prominent application areas. Most institutions remain in the emerging or developing stages of AI adoption, driven primarily by innovation-oriented goals. Faculty perceptions reflect moderate optimism regarding institutional support and strategic alignment, though clarity of AI roadmap remains an area for improvement. Importantly, gender does not significantly influence faculty perceptions, indicating shared institutional experiences and challenges. Overall, the findings suggest that sustained institutional support, clear strategy, and faculty engagement are critical for advancing effective AI integration in higher education.

SUGGESTIONS

- Institutions should develop clear AI strategies and roadmaps aligned with academic goals.
- Continuous faculty training programs should be implemented to enhance AI readiness.
- Institutional support mechanisms should be strengthened to encourage experimentation with AI tools.

LIMITATIONS

- The study relied on self-reported faculty perceptions, which may involve subjective bias.
- The sample size was limited, restricting broader generalization of findings.

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