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Original Research Paper

Management

AI-ENHANCED PEDAGOGY AND FACULTY ROLES IN BUSINESS EDUCATION: A MIXED-METHODS STUDY FROM INDIAN HIGHER EDUCATION

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ABSTRACT

Artificial Intelligence (AI) is transforming higher education by reshaping pedagogy, faculty roles, and student learning outcomes. This study investigates how faculty in Business Administration programs in a Tier-2 Indian city adopt AI tools and integrate them into teaching practices. Using a convergent mixed-methods design, quantitative surveys of 50 faculty members assessed relationships between demographic factors (age, qualification, teaching experience, digital literacy) and AI adoption, while semi-structured interviews explored faculty perceptions, ethical considerations, and pedagogical transformations. Findings reveal that younger, highly qualified, and digitally literate faculty adopt AI more frequently, while infrastructural limitations and ethical concerns constrain broader integration. Faculty roles evolve as facilitators, curriculum designers, mentors, analysts, and ethical guides, mediating the impact of AI on student outcomes such as personalized learning, engagement, critical thinking, and ethical awareness. A conceptual framework illustrates pathways from AI tools through faculty roles to student outcomes, moderated by demographic and institutional factors. Implications for faculty development, curriculum redesign, and policy formulation are discussed, providing guidance for effective human–AI collaboration in business education. Future research should adopt multi-institutional, longitudinal, and student-centered designs to validate and extend these findings.

KEYWORDS : Artificial Intelligence; Business Education; Faculty Roles; Pedagogy; Human–AI Collaboration; Mixed-Methods; TPACK; Student Outcomes; India

1. INTRODUCTION

Artificial Intelligence (AI) is rapidly transforming higher education, reshaping pedagogy, faculty roles, and student learning experiences. In business education, AI tools such as intelligent tutoring systems (ITS), AI-powered chatbots, predictive analytics, generative case studies, and learning management system (LMS) analytics are enabling personalized learning, data-driven insights, and adaptive curriculum delivery. These technological shifts align with established pedagogical theories: constructivism and connectivism emphasize active knowledge creation, collaboration, and networked learning, while transformative learning underscores critical reflection and shifts in students' frames of reference.

Faculty roles are evolving beyond traditional knowledge transmission to encompass facilitation, curriculum design, mentorship, analytics, and ethical guidance within AI-mediated classrooms. The Technological Pedagogical Content Knowledge (TPACK) framework provides a lens to understand how faculty integrate AI tools into content-relevant and pedagogically sound teaching.

Research Objectives

This study addresses these gaps by:

1. Examining patterns of AI adoption among business education faculty in Tier-2 Indian higher education institutions.
2. Analyzing how AI integration reshapes faculty roles and pedagogical practices.
3. Investigating the moderating influence of demographic factors (age, qualification, teaching experience, digital literacy) on AI adoption.
4. Developing a conceptual framework linking AI tools, faculty roles, and student outcomes through TPACK and pedagogical theories.

Literature Review

The literature on Artificial Intelligence (AI) in higher education highlights its growing role in transforming teaching practices, faculty responsibilities, and student learning outcomes. Brynjolfsson and McAfee (2017) examined the broader impact of AI on educational systems and argued that AI-driven technologies promote automation, adaptive learning, and data-informed decision-making, shifting faculty roles from information providers to mentors and analysts.

In the Indian context, Singh and Sharma (2021) identified digital literacy gaps, inadequate infrastructure, and lack of faculty training as major barriers to AI adoption in higher education institutions. Similarly, Patel (2022) found disparities in AI implementation between metropolitan and Tier-2 institutions due to infrastructural and administrative limitations.

Holmes et al. (2021) explored ethical concerns in AI-mediated learning and highlighted issues related to algorithmic bias, privacy, and accountability. Their study emphasized the need for ethical guidelines and responsible AI governance in educational settings.

Chen and Zhang (2022) demonstrated that institutional support, perceived usefulness, and faculty digital competence significantly influence AI adoption. Faculty were more likely to integrate AI tools when supported through training and administrative encouragement.

Further, Kumar and Gupta (2023) found that younger and highly qualified faculty in Tier-2 Indian institutions adopted AI more actively, whereas senior faculty expressed concerns regarding workload, ethics, and institutional readiness. Overall, the literature suggests that successful AI integration in business education depends on faculty preparedness, institutional infrastructure, ethical governance, and continuous professional development.

Research Methodology

To capture the multifaceted impact of Artificial Intelligence (AI) on business education, this study employs a convergent mixed-methods research design. This approach is selected for its capacity to provide a holistic understanding by triangulating quantitative breadth with qualitative depth. By simultaneously collecting and analyzing both data streams, the study validates statistical trends regarding AI adoption with the nuanced, lied experiences of faculty members. This dual-lens methodology is essential for constructing a robust conceptual framework that links AI tools to evolving faculty roles and student outcomes, while accounting for institutional and demographic moderators.

Participants, Data Collection, and Analysis

The study was conducted among Business Administration

faculty members from JCD Institute of Business Management, CMK Girls College, and Chaudhary Devi Lal University. A purposive sample of 50 faculty members was selected based on their teaching experience and familiarity with AI-enabled pedagogical tools such as Intelligent Tutoring Systems, generative AI, and LMS analytics. The sample size was determined using Cohen's (1992) guidelines to ensure adequate statistical power. The demographic profile included faculty with diverse qualifications and teaching experience, enabling analysis of how professional maturity and digital literacy influence AI adoption.

A triangulated data collection approach was adopted to ensure validity and reliability. Quantitative data were collected through structured surveys measuring AI adoption, teaching effectiveness, and familiarity with AI tools, supported by student engagement and performance indicators. Semi-structured interviews explored faculty perceptions regarding pedagogical transformation, ethical concerns, and evolving professional roles. In addition, institutional documents and an Ethical AI Checklist were analyzed to assess policy alignment, responsible AI use, and privacy considerations.

Quantitative data were analyzed using SPSS v26 and AMOS/SmartPLS through descriptive statistics, ANOVA, and Structural Equation Modeling (SEM). Qualitative data were examined using thematic analysis based on Braun and Clarke (2006). Intercoder reliability yielded a Cohen's Kappa value of 0.82, indicating strong consistency. The integration of quantitative and qualitative findings enabled the development of a comprehensive framework explaining how AI tools reshape faculty roles and influence student outcomes in business education.

Findings and Discussion

Quantitative Findings: AI Adoption Patterns

Survey and institutional data, including student engagement and performance metrics, reveal patterns of AI adoption among business faculty.

Frequency of AI Tool Usage Among Faculty

AI Tool	Never (%)	Rarely (%)	Sometimes (%)	Often (%)	Very Often (%)
Intelligent Tutoring Systems (ITS)	10	12	28	36	14
AI-Powered Chatbots	8	18	32	28	14
Predictive Analytics	14	20	30	26	10
Generative AI Case Studies	12	16	34	28	10
LMS Analytics	6	10	28	40	16

Key Insights:

- ITS and LMS analytics are most frequently used, emphasizing personalized learning and engagement monitoring.
- Generative AI case studies and predictive analytics show moderate adoption, indicating cautious experimentation.
- Regression and SEM analyses confirm age, qualification, and digital literacy significantly moderate the relationship between AI adoption and faculty roles ($p < 0.05$). Younger, PhD-qualified, and digitally literate faculty integrate AI more extensively.

Direct Student Data Integration:

- Classes led by high-AI-adoption faculty show 10–15% higher engagement and improved grades in analytics-intensive modules.
- Students report increased critical thinking, problem-solving, and ethical awareness, validating faculty-reported pedagogical impacts.

Integration of Quantitative and Qualitative Findings

SEM Findings:

- **Direct Effects:** AI adoption positively predicts faculty roles ($\beta = 0.62$, $p < 0.01$), which in turn positively influence student outcomes ($\beta = 0.58$, $p < 0.01$).
- **Moderating Effects:**
  - Age negatively moderates adoption → faculty roles (older faculty integrate AI less).
  - Digital literacy positively moderates adoption → roles → student outcomes.
- **Mediation:** Faculty roles fully mediate the relationship between AI adoption and student outcomes, consistent with TPACK-informed pedagogy.

Qualitative Insights:

- AI enhances faculty roles as facilitators, mentors, co-creators, analysts, and ethical guides.
- Faculty integrate technological knowledge (AI tools), pedagogical knowledge, and content knowledge (TPACK) to improve student learning.

Conceptual Framework Development

Figure 1: Conceptual Framework of AI-Enhanced Pedagogy

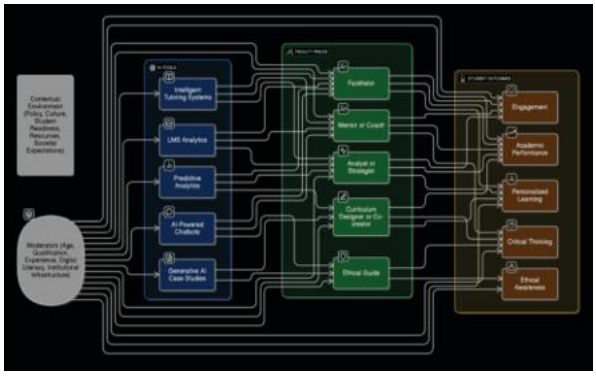
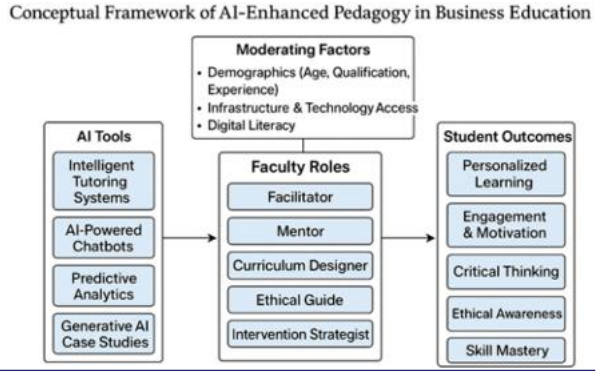


Figure 1: Conceptual Framework of AI-Enhanced Pedagogy illustrating how AI tools influence evolving faculty roles, which in turn shape student outcomes, moderated by demographic and institutional factors within a broader contextual environment.

- Faculty roles are shifting from traditional lecturers to facilitators, mentors, analysts, co-creators, and ethical guides, with AI supporting personalized and collaborative learning.
- Younger, PhD-qualified, and digitally literate faculty adopt AI more actively, highlighting the need for training programs for senior and less tech-savvy educators.
- Limited infrastructure, digital divides, privacy concerns, and algorithmic bias remain major barriers, making responsible and ethical AI use essential.
- AI improves student engagement, critical thinking, ethical reasoning, and academic performance, but success depends on faculty competence and effective TPACK integration.

Practical Implications



This study provides practical guidance for educators and institutions by emphasizing faculty development through AI training and TPACK-based workshops, curriculum redesign using AI-enabled case studies and adaptive learning tools, and stronger institutional infrastructure such as improved LMS and digital support systems. It also highlights the need for clear policies on ethical AI use, data privacy, bias mitigation, inclusivity, and continuous monitoring of AI adoption and learning outcomes.

CONCLUSION

This study concludes that Artificial Intelligence (AI) is a transformative force in Indian business education, significantly reshaping pedagogy, faculty roles, and student learning outcomes. AI tools such as intelligent tutoring systems, chatbots, predictive analytics, generative case studies, and LMS analytics enable faculty to move beyond traditional teaching roles and function as facilitators, mentors, curriculum designers, analysts, and ethical guides. The findings show that younger, highly qualified, and digitally literate faculty adopt AI more effectively, while challenges such as limited infrastructure, digital divides, and ethical concerns restrict wider implementation. Faculty roles were found to mediate the relationship between AI adoption and student outcomes, improving personalized learning, engagement, critical thinking, and ethical awareness. The study also extends pedagogical understanding by integrating constructivist, connectivist, transformative learning, and TPACK theories. Practically, it offers recommendations for faculty training, curriculum redesign, institutional support, and ethical policy development. Ultimately, AI enhances rather than replaces faculty roles, and its successful integration depends on balancing technology, pedagogy, and ethical responsibility to create inclusive and high-quality business education.

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