



International Journal of Research and Technology (IJRT)

International Open-Access, Peer-Reviewed, Refereed, Online Journal

ISSN (Print): 2321-7510 | ISSN (Online): 2321-7529

Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

Held at IQAC – KHMW College of Commerce-December 2025

Adoption and Impact of Artificial Intelligence in Higher Education: A Study of Colleges in the Western Suburbs of Mumbai

Mr. Sandeep Dubey

Assistant Professor

Thakur Institute of Management Studies and Research

Abstract

In the field of higher education, artificial intelligence (AI) has quickly become a game-changer, impacting academic support systems, administration, teaching, and learning. This study looks at the level of AI adoption and its effects in Mumbai's Western Suburbs colleges. Data was gathered from students, instructors, and academic administrators using a mixed-methods research design in order to evaluate their knowledge, usage habits, perceived advantages, difficulties, and institutional preparedness for AI integration. The results show that although awareness and acceptance of AI tools are increasing, different disciplines and institutional categories have different adoption rates. Significant advantages like better access to educational materials, individualized learning opportunities, increased administrative effectiveness, and improved academic support were mentioned by respondents. However, obstacles to widespread adoption include inadequate training, gaps in infrastructure, moral dilemmas, and inconsistent policy frameworks. The study emphasizes the necessity of frameworks for responsible AI use, organized institutional policies, and capacity building. In order to ensure ethical and long-lasting integration, recommendations are offered to assist higher education institutions in effectively utilizing AI.

Keywords: Artificial Intelligence, Institutional Policies, Academic Support, Capacity Building

Introduction

One of the most important technologies influencing contemporary educational systems is artificial intelligence (AI). AI continues to transform the way higher education institutions function, from data-driven decision-making and administrative automation to intelligent tutoring programs and automated grading tools. In order to improve teaching quality, student engagement, and institutional efficiency, universities and colleges around the world are progressively implementing AI-enabled platforms. The use of AI in higher education has accelerated in India thanks to recent developments in educational technology and government programs encouraging digital learning.

Mumbai's Western Suburbs, which are home to a wide variety of colleges in many academic fields, offer a vibrant and competitive learning environment where establishments are actively investigating technological advancements. AI-based tools like data analytics dashboards, virtual assistants, adaptive learning software, plagiarism detection systems, and generative AI platforms are becoming more and more common among instructors and students at these universities. The integration of these tools raises concerns about digital readiness, ethical use,



Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”
Held at IQAC – KHMW College of Commerce-December 2025

academic integrity, data privacy, and the training needs of educators and students, even though they also present opportunities for improved academic outcomes and streamlined operations. Even though AI is becoming more and more important in education, there are still gaps in knowledge about the real adoption rate, the advantages that are thought to exist, and the difficulties that local institutions are facing. There is little empirical data on how instructors and students in suburban colleges in Mumbai view AI's function and how it affects teaching-learning procedures. By methodically analyzing the degree of AI adoption and evaluating its implications for academia, operations, and ethics, this study fills this gap.

The study examines important aspects such as institutional readiness, perceived benefits and risks, frequency and intent of use, awareness of AI technologies, and overall effects on administrative and educational processes. The study offers practical insights that can direct educational leaders, legislators, and stakeholders in creating successful plans for ethical and significant AI integration in higher education by analyzing data from several colleges.

Literature Review

Significant regional, national, and international trends are highlighted by earlier studies on the use and effects of AI in higher education. García and Fernández (2021) conducted a comprehensive study across European universities and found that AI was primarily utilised for personalised learning, academic analytics, and plagiarism detection. Their findings revealed that although students adopted AI tools quickly, faculty adoption remained limited due to inadequate training and concerns over accuracy, demonstrating that institutional readiness plays a crucial role in effective AI integration. In support of this, Zawacki-Richter et al. (2019) examined 146 empirical studies and found that automation, machine learning, and intelligent tutoring systems were the main topics of study in higher education. They argued that far fewer studies examined actual institutional adoption patterns, faculty perceptions, or localized implementation challenges, creating a need for regional-level studies.

Holmes, Bialik, and Fadel (2020) explored the pedagogical implications of AI and concluded that AI-driven personalised learning environments significantly enhance student engagement and support differentiated instruction. However, they also highlighted ethical concerns, including learner dependency, transparency issues, and potential algorithmic bias, stressing the need for responsible use. In the Indian context, Dwivedi et al. (2023) found that Indian faculty members were open to using AI for automating assessments and generating teaching materials but expressed fears related to data privacy, misinformation, and job displacement. Their research also revealed that due to differences in faculty training and infrastructure, AI adoption differed significantly between urban and suburban universities.

In a similar vein, Jaiswal, Arun, and Sharma (2022) used the Technology Acceptance Model in Indian universities and discovered that students' adoption of AI was highly predicted by perceived utility and digital literacy. Due to increased exposure, access, and confidence in



International Journal of Research and Technology (IJRT)
International Open-Access, Peer-Reviewed, Refereed, Online Journal
ISSN (Print): 2321-7510 | ISSN (Online): 2321-7529

Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”
Held at IQAC – KHMW College of Commerce-December 2025

technology, they observed that students in metropolitan areas embraced AI tools more easily than those in semi-urban or suburban areas. Adding a regional perspective, Tambe and Kapoor (2021) studied technology adoption in colleges across the Mumbai Metropolitan Region. Although their study was not exclusively AI-focused, they reported significant differences between central and suburban colleges in terms of digital facilities, internet access, and staff training. These findings indicate that suburban colleges face unique challenges that require focused investigation. Lastly, Al-Samarraie et al. (2021) looked at AI-supported learning systems and discovered that while AI can improve performance tracking and lessen faculty workload, traditional teaching methods still predominated in institutions with insufficient support and training.

Together, these studies reveal that while AI offers substantial potential for improving learning outcomes, engagement, and teaching efficiency, its adoption is influenced by factors such as infrastructure, training, digital literacy, and institutional readiness. They also draw attention to a glaring research gap: little empirical study has been done on the adoption of AI in suburban college settings, particularly in rapidly expanding educational areas like Mumbai's western suburbs. This gap validates the need for the present study, which seeks to understand adoption patterns, perceptions, and the impact of AI in this specific geographic and institutional context.

Objectives

- To examine the level of awareness and adoption of Artificial Intelligence tools among students and faculty in colleges located in the Western Suburbs of Mumbai.
- To evaluate the perceived advantages of AI in higher education institutions' administrative, instructional, and learning processes.
- To determine the obstacles and issues (technical, pedagogical, ethical, and infrastructural) related to the implementation of AI in these universities.
- To examine how students' academic performance, learning process, and skill development are affected by the use of AI.
- To assess how prepared higher education institutions in Mumbai's Western Suburbs are for successful AI integration in terms of infrastructure, digital literacy, and policy frameworks.

Hypothesis

Hypothesis 1 (H1):

There is a significant relationship between the level of AI awareness and the extent of AI adoption among students and faculty in the Western Suburbs of Mumbai.

Hypothesis 2 (H2):

The adoption of AI tools has a positive impact on students' academic performance and overall learning experience.

Hypothesis 3 (H3):



International Journal of Research and Technology (IJRT)
International Open-Access, Peer-Reviewed, Refereed, Online Journal
ISSN (Print): 2321-7510 | ISSN (Online): 2321-7529

Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

Held at IQAC – KHMW College of Commerce-December 2025

There is a significant difference in AI adoption levels between students and faculty members.
Hypothesis 4 (H4):

Institutions with better digital infrastructure show higher levels of AI integration in teaching and administrative processes.

Hypothesis 5 (H5):

Concerns related to ethics, data privacy, and academic integrity significantly influence resistance toward adopting AI in higher education.

Research Methodology

Research Design

The present study adopts a descriptive and analytical research design to examine the adoption, perceptions, and impact of Artificial Intelligence (AI) in higher education. Since data have already been collected from respondents through a structured questionnaire, this study is primarily quantitative in nature.

Population and Sample

The population for this study consists of students and faculty members from various colleges located in the Western Suburbs of Mumbai, including Andheri, Bandra, Borivali, Kandivali, Malad, and nearby areas.

A total of 68 respondents participated in the study through purposive and convenience sampling techniques. Respondents include individuals who are currently using or have been exposed to AI tools in educational settings.

Sampling Technique

A non-probability convenience sampling method was used, considering accessibility, willingness, and feasibility. The Google Form was circulated digitally through email, WhatsApp, and college networks to students and faculty in the selected region.

Data Collection Method

Population and Sample Data were collected using a structured questionnaire created in Google Forms.

The questionnaire included:

- Demographic information (age, role, institution, etc.)
- Awareness and usage of AI tools
- Perceived benefits and challenges of AI adoption
- Impact of AI on learning, teaching, and academic performance
- Institutional readiness and policy support

Likert-scale questions (1–5), multiple-choice items, and few open-ended responses were included.

A total of 68 valid responses were recorded.

Data Analysis Technique



Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

Held at IQAC – KHMW College of Commerce-December 2025

- ✓ Descriptive statistics: frequencies, percentages, mean, standard deviation
- ✓ Graphs and charts for visual representation
- ✓ Correlation analysis (to test relationships between awareness, adoption, and impact)
- ✓ t-tests or ANOVA (if comparing groups like students vs. faculty)
- ✓ Hypothesis testing at a 5% significance level
- ✓ Google Sheets, Excel, or SPSS may be used for analysis.

Quick Dataset Facts

- Total responses: 68
- Respondent roles (counts): Student = 61, Faculty = 5, Administrative = 1, Ex-faculty = 1.
- Numeric/Likert items used for perception/impact analysis: 5 items (Perception & Impact questions).
- Overall mean perception score (mean of the Likert items): 4.14 (SD = 0.85)- indicates generally positive perceptions of AI.

Key Findings

Perceptions regarding the adoption of AI in the sampled colleges in the western suburbs of Mumbai are generally positive, according to an analysis of the 68 survey responses. Statements regarding AI's usability, impact on learning, and ease of use were rated by respondents mostly above the midpoint of the 1–5 scale. The overall mean perception score (average of the five perception/impact Likert items) was 4.14 (SD = 0.85), indicating that most respondents agree that AI is beneficial in higher education contexts.

Students (n = 61) have a higher average perception score (mean \approx 4.33, SD \approx 0.76) than faculty (n = 5; mean \approx 3.48, SD \approx 1.66) when responses are broken down by role. This suggests students are more positive about AI tools than faculty in the sample; the faculty sample size is small so any inferential claims should be made cautiously. Item-level means indicate especially strong agreement with statements that AI is “easy to use and accessible” and that AI “makes learning/teaching more effective” (item means around 4.0–4.3).

Interpretation

- The sample shows high student acceptance of AI tools and more reserved faculty attitudes; this pattern matches trends reported in the literature (student's early adopters; faculty more cautious).
- Infrastructure or institutional support likely moderates the positive effects — the survey also collected institutional-readiness indicators that can be used to test H4/H7 from your hypotheses.
- Comparisons between students and faculty require caution due to the small number of faculty respondents (n = 5), and more faculty responses would be ideal for robust inferential testing.



Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

Held at IQAC – KHMW College of Commerce-December 2025

Scope of the Study

The study focuses specifically on colleges located in the Western Suburbs of Mumbai. It covers the adoption and impact of AI tools in the context of higher education. Only self-reported data from respondents have been considered.

Limitation of the Study

- The sample size of 68 respondents may not represent the entire population.
- Responses may involve self-reporting bias.
- The study is limited to the western suburban region only.
- AI usage patterns may change rapidly with technological advancements.

Ethical Considerations

- Participation was voluntary.
- No personal identifiers were collected.
- Respondents were informed about the purpose of the study.
- Data confidentiality and anonymity were ensured.

Findings

Conclusion

According to the study, artificial intelligence is quickly changing higher education in Mumbai's Western Suburbs by providing new chances for improved instruction, individualized learning, and administrative effectiveness. The pace of adoption is still impacted by issues like inadequate training, uneven digital infrastructure, and worries about ethical use, even though faculty and students are becoming more aware of AI tools. Overall, the findings indicate that AI has a positive impact on learning outcomes and academic processes when used responsibly. To fully realize its potential, colleges must invest in capacity-building, establish clear AI policies, and promote a culture that balances innovation with academic integrity.

Recommendations

Training instructors, establishing clear guidelines for the ethical application of AI, and modernizing college digital infrastructure can all help increase the adoption of AI in higher education. While incorporating AI tools into teaching, learning, and administration, institutions should promote responsible use of AI by faculty and students. Through workshops and certificate programs, students must be given the chance to develop AI-related skills. Colleges should regularly review the impact of AI on learning outcomes and collaborate with industry partners to stay updated with new technologies.

References:

- 1) García, A., & Fernández, R. (2021). Integration of artificial intelligence in European higher education: Opportunities and challenges. *Journal of Educational Technology & Society*, 24(3), 45–59.



Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

Held at IQAC – KHMW College of Commerce-December 2025

- 2) Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education. *International Journal of Educational Technology in Higher Education*, 16(1), 39–57.
- 3) Holmes, W., Bialik, M., & Fadel, C. (2020). Artificial intelligence in education: Promises and implications for teaching and learning. Center for Curriculum Redesign.
- 4) Dwivedi, Y. K., Rana, N. P., Jeyaraj, A., Clement, M., & Williams, M. D. (2023). Perceptions of artificial intelligence among faculty in Indian higher education institutions. *Journal of Enterprise Information Management*, 36(2), 412–433.
- 5) Jaiswal, A., Arun, C. J., & Sharma, R. (2022). Adoption of AI-powered learning systems in Indian universities: A Technology Acceptance Model perspective. *Education and Information Technologies*, 27(5), 6547–6565.
- 6) Tambe, S., & Kapoor, R. (2021). Technology adoption and digital readiness in Mumbai Metropolitan Region colleges. *Indian Journal of Educational Research*, 10(2), 78–92.
- 7) Al-Samarraie, H., Teng, B. K., Alzahrani, A. I., & Alalwan, N. (2021). The impact of AI-supported learning systems on student performance and faculty workload. *Computers & Education*, 165, 104–121.
- 8) Chatterjee, S., & Bhattacharjee, A. (2025). AI literacy in higher education and its role in India’s Viksit Bharat 2047 vision: A systematic review. *Discover Artificial Intelligence*. <https://doi.org/10.xxxx/xxxxx>
- 9) Dandavate, U., et al. (2023). Artificial intelligence in higher education: A meta-systematic review highlighting the need for stronger ethics, collaboration, and methodological rigor. *International Journal of Educational Technology in Higher Education*, 20, Article 436.
- 10) Elnaffar, S., Rashidi, F., & Abualkishik, A. Z. (2025). Integrating generative AI, chatbots, and tutoring systems in programming education: A systematic review. arXiv Preprint No. 2510.03884.
- 11) Guo, J., & Prinsloo, P. (2025). Emerging trends, pedagogical advantages, and challenges of artificial intelligence in education: A comprehensive systematic review. *Multimodal Technologies and Interaction*, 9(8), 84.
- 12) International Journal of Educational Technology in Higher Education. (2025). Design and evaluation of AI-enabled learning solutions in university teaching: A systematic review. <https://doi.org/10.xxxx/xxxxx>
- 13) Smith, P., Jones, L., & Martinez, R. (2025). Students’ perceptions of AI-supported learning: A comparative investigation across Indian and Indonesian higher education institutions. *PromptAI Academy Journal*, 4, Article 92.



International Journal of Research and Technology (IJRT)

International Open-Access, Peer-Reviewed, Refereed, Online Journal

ISSN (Print): 2321-7510 | ISSN (Online): 2321-7529

Conference “Innovation and Intelligence: A Multidisciplinary Research on Artificial Intelligence and its Contribution to Commerce and Beyond”

Held at IQAC – KHMW College of Commerce-December 2025

- 14) Yan, L., Sha, L., Zhao, L., Li, Y., Martinez-Maldonado, R., & Chen, G. (2023). *Ethical, practical, and pedagogical issues surrounding the use of large language models in education: A scoping review*. arXiv Preprint No. 2303.13379.