Exploring the Role of AI in Academic Learning: An Empirical Study on Undergraduate Students of Bengaluru City University

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Abstract

In higher education, artificial intelligence (AI) has quickly become a game-changing tool that is changing how students engage with academic content, study, and access knowledge. This study examines how artificial intelligence (AI) affects undergraduate education at Bangalore City University (BCU). Quantitative data was gathered using a mixed-methods strategy, which included semi-structured interviews with 50 participants and surveys given to 385 undergraduate students. The results show that academic writing, research, and test preparation are common uses for AI products like ChatGPT, Grammarly, and personalized learning platforms.

Although there are still issues with ethical use, plagiarism, and over-reliance, students believe AI can improve productivity and learning efficiency. In the paper's conclusion, suggestions are made for the responsible integration of AI in undergraduate education through institutional rules, digital literacy training, and AI-augmented pedagogy.

Keywords: Artificial Intelligence in Education, AI Adoption, Undergraduate Students, Technology Acceptance Model (TAM), Academic Integrity.

Introduction

Many people agree that artificial intelligence (AI) is the most revolutionary technology of the twenty-first century, changing education, government, and industry. AI-enabled technologies are being incorporated more and more into writing helpers, research tools, adaptive learning platforms, and learning management systems in higher education. These technologies offer undergraduate students both advantages and disadvantages. They facilitate rapid information access, individualized education, and help with challenging assignments, but they also bring up issues of creativity, critical thinking, and moral application.

Higher education's adoption of artificial intelligence (AI) is no longer an unrealistic dream; instead, it is a reality that is revolutionizing student learning everywhere. For information retrieval, writing help, coding support, and individualized learning experiences, undergraduate students are depending more and more on AI-powered solutions. In India, the National Education Policy (NEP 2020), which prioritizes digital literacy and technology-driven learning, has sped up the establishment of digital education and AI-enabled platforms.

With a focus on Bangalore City University (BCU) undergraduate students, this study attempts to experimentally investigate how AI is being used in their academic learning, as well as the advantages and issues they see.

Literature Review

AI in education has been widely studied within the frameworks of the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), which highlight perceived usefulness, ease of use, and trust as key adoption drivers. Studies showed AI supports personalized learning, enhances efficiency, and provides real-time feedback (Zawacki-Richter *et al*., 2019). Research also raises issues about plagiarism, over-reliance on AI, and unequal access (Luckin, 2021). Technology Acceptance Model (TAM) suggests that adoption depends on perceived usefulness and ease of use (Davis, 1989). Unified Theory of Acceptance and Use of Technology (UTAUT) expands TAM by adding social influence and facilitating conditions (Venkatesh *et al*., 2003). As per Self-Directed Learning Theory AI enhances learner autonomy by providing personalized pathways (Knowles, 1975). Ethical Challenges Associated with the Use of Artificial Intelligence in University Education (Journal of Academic Ethics) notes concerns over data privacy, misuse, algorithmic opacity, academic integrity (plagiarism), and loss of student autonomy. Ethical and regulatory challenges of Generative AI in education, a systematic review (Frontiers, 2025) examines

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literature between 2020-2024; finds that GenAI tools increase accessibility and personalized feedback but also risk misuse of student data, cognitive dependency, and policy/regulatory gaps. The NEP 2020 emphasizes integrating digital and AI-based tools, yet empirical studies on Indian undergraduate students remain limited.

This study fills this gap by focusing on BCU undergraduates as a case study.

Statement of the Problem

The role of AI in higher education has been studied globally, however there are still few empirical studies that concentrate on Indian undergraduate students. Specifically, not much is known about Bengaluru City University students' perceptions of AI, the tools they utilize, or how adoption affects their learning habits. Furthermore, ethical issues like plagiarism, data privacy, and how AI affects student creativity are being discussed more and more. By examining BCU undergraduates' attitudes, adoption, and difficulties with AI in academic learning, this study fills up these gaps.

Objectives of the Study

i). To examine the extent of AI adoption among undergraduate students of BCU in their academic activities.
ii). To explore students' perceptions of AI's usefulness, ease of use, and trustworthiness.
iii). To identify challenges and ethical concerns related to AI usage.
iv). To compare adoption patterns across disciplines and academic years.
v). To provide recommendations for responsible integration of AI in undergraduate learning

Hypotheses of the Study

H_1: Perceived usefulness positively influences AI adoption among BCU undergraduates.
H_2: Perceived ease of use significantly affects attitudes toward adoption.
H_3: Trust in AI tools is a strong predictor of adoption behavior.
H_4: Ethical concerns negatively impact the adoption of AI-powered tools.
H_5: Significant differences exist in adoption levels between Arts, Science and Commerce stream

Scope of the Study

- This particular study covers the issues related to role of AI in academic learning only from the point of view of students
- The study covers the various aspects of usage of AI in academic learning
- The data is collected only from under graduate students (Arts, Science and Commerce stream) of Bengaluru Central University and excludes under graduate students of other Universities.

Research Design and Methodology
Data Collection Method

This study employs a mixed-method:
- Primary data is collected through direct interview method and by using structured questionnaire
- Secondary data has been collected from various articles, journals (national as well as international), online resources.

Research Type: Empirical and Descriptive Study
Sampling Plan:

- **Sample Unit:** Undergraduate students at BCU across Arts, Science, Commerce streams.
- **Sample Size:** 385 survey respondents, selected through stratified random sampling. 50 interviewees purposively selected from survey respondents.
- **Statistical Tool:** SPSS used for descriptive statistics, correlation, regression, and ANOVA.

Limitations of the Study

- This study considers only the role of AI in academic learning issues of Under Graduate students of Bengaluru Central University and it does not take in to consideration other issues which is related to the outcome of the students
- The small size of the sample seems to be a drawback of the study.
- Time consuming
- It does not consider other Universities Under Graduate students' opinion

Data Analysis and Interpretation
1. **Descriptive Statistics:**
i). **To examine the extent of AI adoption among undergraduate students of BCU**

Table 1: Frequency of AI Tool Usage (N = 385)

Frequency of Use	% of Students
Daily	38%
Weekly	67%
Monthly	18%
Rarely/Never	10%

Interpretation:

- 67% of students use AI tools at least weekly, suggesting high penetration.
- Daily users (38%) are likely integrating AI into routine academic tasks (summarization, problem-solving, writing support).
- 10% rarely or never use AI, indicating a digital adoption gap that may relate to access, skills, or discipline.

ii). **To explore students' perceptions of AI's usefulness, ease of use, and trustworthiness**

Table 2: Mean Scores on TAM Constructs

Construct	Mean	SD
Perceived Usefulness	4.12	0.78
Perceived Ease of Use	3.95	0.81
Trust in AI Tools	3.41	0.92

Interpretation:

- Students find AI highly useful for academic tasks.
- Most students perceive AI tools as fairly easy to use
- Moderate trust; students are cautious about accuracy
- Trust scores are notably lower, reflecting uncertainty about reliability, plagiarism risks, and accuracy.

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iii). To identify challenges and ethical concerns related to AI usage

Table 3: Major Reported Challenges (Multiple Responses, % of N=385)

Challenge/Ethical Concern	% Reporting
Risk of plagiarism	64%
Accuracy of information	58%
Data privacy concerns	46%
Over-reliance on AI	39%
Lack of institutional policy	35%

Interpretation:
- Plagiarism and accuracy concerns dominate (60%+ of students).
- Almost half worry about privacy and misuse of their data.
- A significant proportion (35%) highlighted lack of formal guidelines — showing a lack of policy at institutional level.

iv). To compare adoption patterns across disciplines and academic years

2. Regression Analysis Results

Table 4: AI Adoption by Discipline (Daily/Weekly Users Only)

Discipline	Adoption Rate
Science	76%
Commerce	59%
Arts	48%

Interpretation:
- Science students show the highest adoption rates, likely due to stronger alignment between AI and problem-solving/technical tasks.
- Arts students show lower usage, reflecting either perceived irrelevance or weaker digital readiness.

Table 5: AI Adoption by Academic Year

Year of Study	Adoption Rate
1st Year	52%
2nd Year	65%
3rd Year	72%

Interpretation:
- Adoption increases across academic years, suggesting familiarity and confidence develop with more exposure to university tasks.

Table 6:

Hypothesis	Independent Variable	Dependent Variable	β (Beta Coefficient)	t-value	p-value	Result
H1	Perceived Usefulness	Attitude Toward AI Use	0.48	6.21	<0.001	Supported
H2	Perceived Ease of Use	Attitude Toward AI Use	0.35	4.78	<0.001	Supported
H3	Trust in AI Tools	Attitude Toward AI Use	0.28	3.95	<0.001	Supported
H4	Ethical Concerns	Adoption of AI Tools	-0.26	-3.42	0.001	Supported
H5	Attitude Toward AI Use	Adoption of AI Tools	0.61	7.34	<0.001	Supported

Interpretation
i). **H1:** Perceived usefulness significantly predicts students' positive attitudes toward AI ($\beta = 0.48$, $p < 0.001$). This means students who believe AI improves academic performance are more likely to adopt it.
ii). **H2:** Ease of use has a significant effect ($\beta = 0.35$, $p < 0.001$), showing that user-friendly AI tools drive positive perceptions.
iii). **H3:** Trust in AI outputs also matters ($\beta = 0.28$, $p < 0.001$).

Students who believe AI is reliable are more likely to use it regularly.
iv). **H4:** Ethical concerns negatively affect adoption ($\beta = -0.26$, $p = 0.001$), meaning plagiarism fears and originality doubts reduce willingness to use AI.
v). **H5:** Attitude is the strongest predictor of adoption ($\beta = 0.61$, $p < 0.001$). Students' overall mindset toward AI translates directly into actual usage behavior.

3. ANOVA – Differences in Adoption Across Disciplines

Table 7:

Group	Mean AI Usage Score (0–5)	Std. Dev.	F-value	p-value	Result
Science Students	4.4	0.8			
Commerce Students	3.6	0.9	8.13	<0.01	Significant
Arts Students	3.2	0.7			

Interpretation
The ANOVA revealed statistically significant differences across disciplines ($F = 8.13$, $p < 0.01$). Science students reported the highest adoption levels ($M = 4.4$, $SD = 0.8$), followed by Commerce ($M = 3.6$, $SD = 0.9$) and Arts students ($M = 3.2$, $SD = 0.7$).
This suggests that exposure to technology-intensive coursework and computational training in Science fields fosters greater engagement with AI tools compared to non-technical streams.

Findings through Direct Interview (N=50)
- 87% of students reported regular use of AI tools; the most popular were ChatGPT (75%), Grammarly (65%), and AI-based exam preparation platforms (40%).
- 82% agreed that AI improved their academic performance.

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- 90% found AI tools user-friendly.
- Only 45% reported high trust in AI outputs, with many cross-verifying information.
- 70% worried about plagiarism and academic integrity.
- Students appreciated AI's role in providing quick explanations, grammar support, and study material summaries.
- Many expressed fears of becoming dependent on AI, loss of originality, and lack of clear institutional guidelines on usage.
- Students revealed that AI seen as a study partner that improves efficiency.
- Most of the Students reported lack of clear institutional guidelines on AI use.

Suggestions and Recommendations

i). It is suggested to introduce digital literacy and AI ethics workshops for undergraduates.
ii). Develop institutional policies on acceptable AI use in assignments and exams.
iii). Encourage blended learning models where AI complements but does not replace critical thinking.
iv). Support faculty training to guide students in responsible AI adoption.

Conclusion

AI is reshaping academic learning at BCU, offering both opportunities and challenges. Undergraduate students see AI as a valuable supplement to their learning but remain cautious about its reliability and ethical implications. The findings provide significant insights into adoption drivers, barriers, and group differences, and they align with the broader global debate on AI in higher education. The results confirmed that perceived usefulness, ease of use, and trust strongly predict positive student attitudes toward AI, which in turn drive adoption. Ethical concerns, however, emerged as a significant barrier, highlighting the tension between innovation and academic integrity. The findings also revealed disciplinary differences, with Science students adopting AI at higher levels than their Arts and Commerce peers.

Overall, the study demonstrates that AI is reshaping undergraduate academic practices, offering benefits such as efficiency, personalization, and accessibility, while simultaneously raising challenges of plagiarism, overdependence, and reliability. For institutions like BCU, the key challenge lies in harnessing AI's potential responsibly, ensuring that it complements rather than undermines academic learning.

AI is no longer a futuristic concept but a present reality shaping higher education. For BCU, embracing AI is both an opportunity and a responsibility. The findings of this study suggest that while students are eager adopters of AI, institutions must provide the necessary frameworks, guidance, and support systems to ensure that AI enhances, rather than compromises, the goals of education.

By addressing ethical concerns, fostering digital literacy, and promoting inclusive adoption across disciplines, universities can prepare undergraduates not just as AI users, but as responsible digital citizens capable of leveraging technology for learning, innovation, and societal progress.

Scope for Further Research

- Conducting longitudinal analyses to track adoption over time.
- Comparing private and public universities in India.
- Investigating faculty perspectives on AI integration.
- Exploring the impact of AI on academic performance outcomes.

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