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Reimagining Commerce Education in the Age of Artificial Intelligence: An Empirical Study

Abstract

Artificial Intelligence (AI) has emerged as a transformative force in global education, reshaping how content is delivered, assessed, and internalized. Even in the commerce education—a stream closely aligned with business analytics, banking & finance, accounting, and digital marketing and much more has the relevance of AI even more pronounced due to its alignment with contemporary industry requirements. This study combines extensive theoretical insights with original empirical data collected from 120 commerce students and 30 commerce teachers to analyse how AI is perceived and adopted in higher education. The paper explores the opportunities, challenges, and pedagogical implications of AI integration, while highlighting ethical considerations and digital infrastructural barriers. Findings reveal that both students and teachers acknowledge the significant role AI can play in fostering personalized learning, enhancing conceptual clarity, and supporting administrative efficiency. However, issues such as lack of training, fear of job displacement, data privacy concerns, and inadequate infrastructure continue to hinder effective adoption. The research concludes with strategic recommendations aimed at preparing commerce institutions for the AI-driven future.

Keywords

Artificial Intelligence; Commerce Education; Pedagogy; Digital Skills; Higher Education; Teaching–Learning; Automation.

1. Introduction

Artificial Intelligence has rapidly expanded beyond its traditional scope, influencing sectors such as healthcare, banking, finance, logistics, governance, and education. In the education sector, AI is now recognized not just as a supplementary tool but as a core component that can redefine conventional teaching–learning methods. As commerce education focuses heavily on analytical reasoning, decision-making, data interpretation, and business simulations, AI naturally fits into its framework.

Commerce graduates must acquire competencies aligned with future job markets along with markets dominated by automation, digital transactions, algorithmic trading, and robotic process automation (RPA), customer behaviour prediction, and AI-supported financial decision-making. Therefore, integrating AI into commerce education is not a luxury but a necessity.

The introduction of AI-driven tools, its adaptive learning platforms, intelligent tutoring systems, automated accounting software, predictive analytics, plagiarism detection systems, AI chatbots for doubt resolution, and simulation-based business games has opened new opportunities for modernizing commerce pedagogy.

However, despite its potential, the integration of AI faces several barriers such as lack of technological infrastructure; insufficient training among teachers, ethical dilemmas, resistance to change, and fear of job displacement has made a chaos among the stakeholders of the society. These challenges show the need for a comprehensive empirical analysis to understand how students and teachers perceive AI adoption and how institutions can facilitate its smooth integration.

This paper presents both a theoretical and empirical investigation into the role of AI in commerce education, making it one of the few studies that examine perceptions from both sides—learners and educators.

2. Review of Literature

1) Early A.I. education was limited to rule based but over the period of time, the emergence of machine learning, natural language processing and deep learning transformed A.I. into a powerful learning tool. Luckin et al. (2016) argue that A.I. enables adaptive learning environments which helps the educators to prepare easy content for learners.

2) Siemens and Baker (2014) highlights the ability of learning analytics to predict student performance and recommend timely academic interventions.

3) Brynjolfsson and McAfee (2017) states that AI is restructuring the global business landscape, like automated accounting processes ; application of financial modeling, business forecasting, stimulates digital marketing, enhances decision making and encourages stock

trading environment and so the commerce graduates must be equipped with digital competencies to remain competitive in this changing scenario.

4) Holmes et al. (2019) highlighted that Intelligent Tutoring Systems can significantly enhance learning gains as it provides real time feedback and personalized guide which is very much needed in today's era for education.

5) Studies conducted by OECD (2021) highlighted the challenges and barriers of A.i. Adoption stating that the teachers often lack exposure of AI tools. So, there is an urgent need for A.I. literacy among educators to bridge the gap between traditional learning and learning based on A.I. For this purpose, digital infrastructure is required along with data privacy issues and fear of displacement for teachers. Even the cost factor is also the biggest hindrance for adoption of A.I. in teaching-learning process.

6) UNESCO (2023) Note that A.I. based teaching improves efficiency and inclusion of the learned as it has multiple advantages such as personalized learning pathways, automated learning experiences for complex concepts real time data analytics and skill development, which helps the students to mould their career as per today's need.

Research Gap

Existing studies focus mostly on AI's potential **in general education**. Very few examine its **specific role in commerce education** and even fewer conduct **comparative empirical studies involving both teachers and students**. This study fills this gap by providing robust data from real educational settings.

3. Objectives

The study is framed around the following major objectives:

Primary Objective

The primary objective of the study is to examine the role, relevance, and impact of Artificial Intelligence in commerce education by analyzing awareness, usage, perceptions, and challenges among students and teachers.

Secondary Objectives

1. To analyze the level of AI awareness among commerce students and teachers.
2. To identify perceived benefits of AI in teaching and learning.
3. To examine the practical usage of AI in classroom and self-learning contexts.
4. To examine challenges experienced in AI usage.
5. To compare perceptions between students and teachers.
6. To recommend measures for strengthening AI adoption in commerce education.

4. Hypotheses

- **H₀₁:** Students and teachers differ significantly in their perception of AI's benefits in commerce education.
- **H₀₂:** Inadequate training significantly limits teachers' ability to adopt AI tools.

5. Research Methodology

5.1 Research Design

To check the impact of AI in commerce education, a descriptive, exploratory and mixed method in which quantitative data (questionnaire responses) with qualitative approach through open ended responses on the students and teachers of Bachelor of Commerce.

5.2 Sample Size

A total of 150 respondents are given a structured questionnaire to study the impact of A.I. on commerce education including 120 students and 30 teachers.

5.3 Sampling Method

Non- Probability Sampling Techniques like purposive sampling technique as respondents must be from commerce background and within that Convenience sampling supported ease to data collection to study this particular research paper.

5.4 Tool

A structured questionnaire is used with 5-point Likert scale to check the impact of A.I. on commerce education in classrooms.

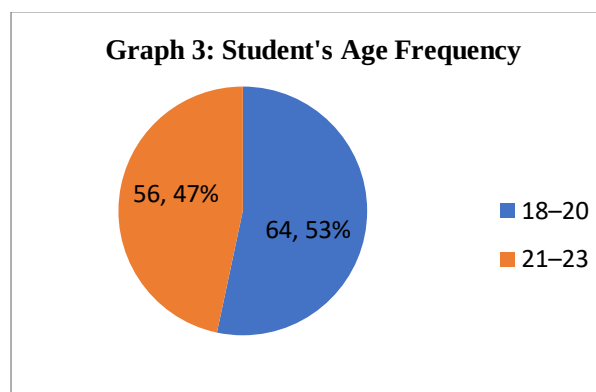
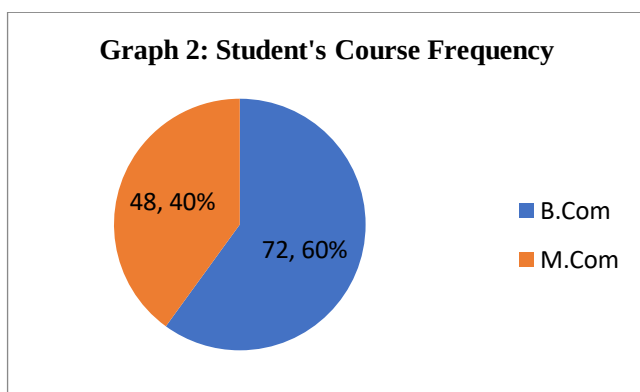
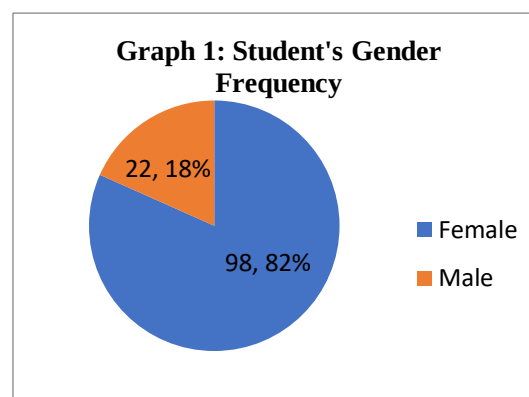
5.5 Data Analysis

Data Analysis is done based on Frequency Distribution, Percentage analysis, mean score analysis, and comparative interpretation.

6. Data Analysis

Table 1: Demographic Profile (Students)

Variable	Category	Frequency	Percentage
Gender	Female	98	81.6%
Gender	Male	22	18.4%
Course	B.Com	72	60%
Course	M.Com	48	40%
Age Group	18–20	64	53%
Age Group	21–23	56	47%



Interpretation:

The above table and graph shows demographic profile of students. The students group was predominantly female and represented both undergraduate and postgraduate commerce students with age ranging from 18 to 23 years.

Table 2: Demographic Profile (Teachers)

Variable	Category	Frequency	Percentage
Gender	Female	22	73%
Gender	Male	8	27%
Experience	0 – 5 years	10	33%
Experience	6 10 years	12	40%
Experience	10 years or more	8	27%
Qualification	M.Com	8	27%
Qualification	M.Com, Ph.D.	22	73%

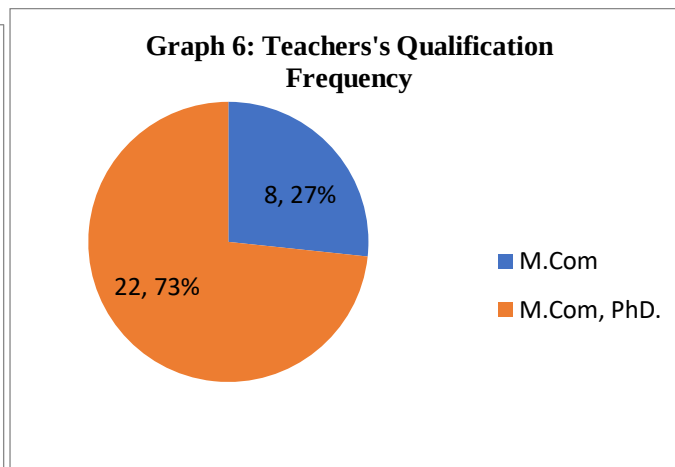
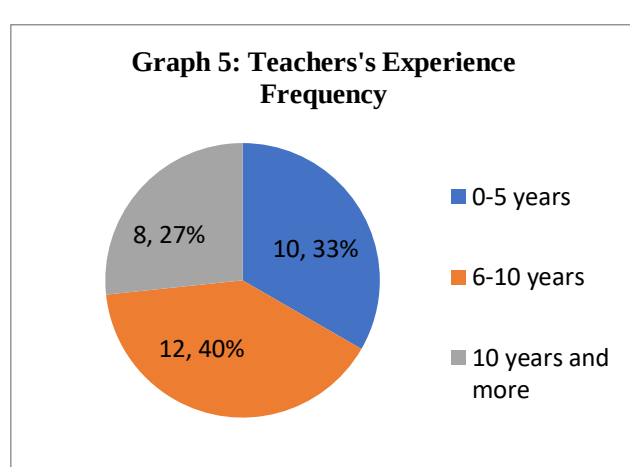
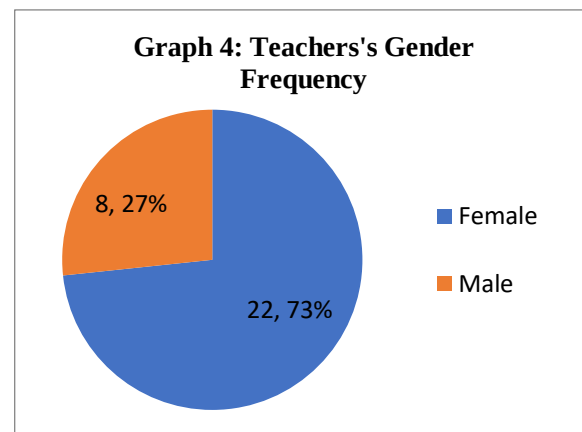
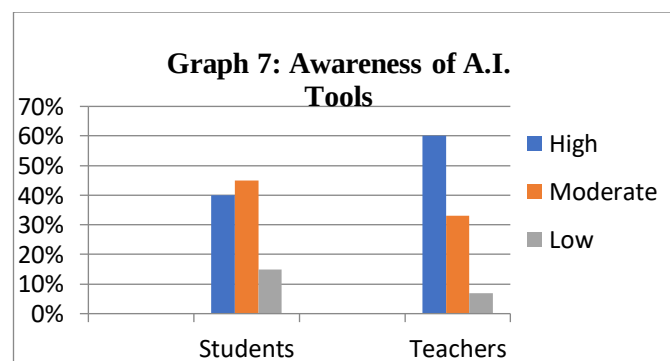


Table 3: Awareness of AI Tools

Group	High	Moderate	Low
Students	40%	45%	15%
Teachers	60%	33%	7%

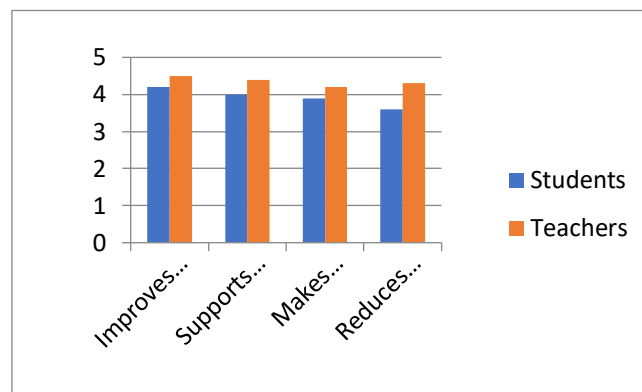


Interpretation: Teachers exhibit significantly higher AI awareness than students.

Table 4: Perceived Benefits (Mean Scores)

Statement	Students	Teachers
Improves conceptual clarity	4.2	4.5
Supports personalized learning	4.0	4.4
Makes classes interactive	3.9	4.2
Reduces workload	3.6	4.3

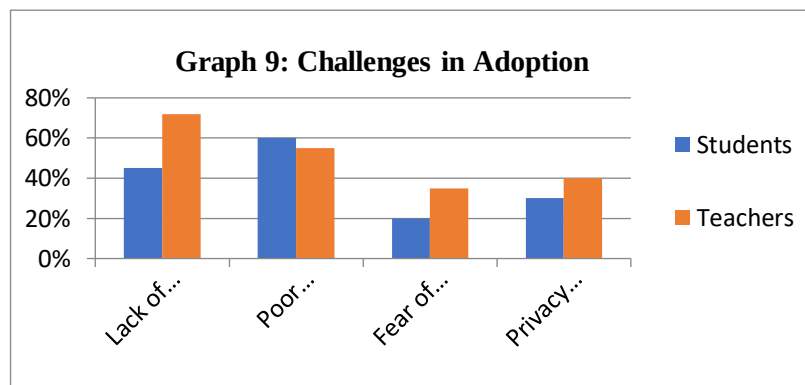
Graph 8: Perceived Benefits



Interpretation: Teachers perceive stronger AI benefits, supporting **H1**.

Table 3: Challenges in Adoption

Challenge	Students	Teachers
Lack of training	45%	72%
Poor infrastructure	60%	55%
Fear of job loss	20%	35%
Privacy concerns	30%	40%



Interpretation: Lack of training is the biggest barrier for teachers, supporting **H2**.

7. Major Findings

- Both groups show growing interest and familiarity with AI.
- Teachers find AI especially useful in reducing workload and enhancing instructional delivery.
- Students appreciate AI for clarity, personalization, and faster comprehension.
- Challenges include insufficient training, weak infrastructure, and privacy issues.
- Despite positive attitudes, institutions lack structured AI integration strategies.
- In spite of A.I. supports but human guidance remains essential in commerce subjects.

8. Suggestions

1. Provide AI literacy programs and skill enhancement workshops for teachers.
2. Upgrade digital facilities in commerce institutions.
3. Integrate AI-based modules into commerce curricula.
4. Establish ethical guidelines for responsible AI usage.
5. Encourage collaborative AI–teacher pedagogical models.

9. Conclusion

Although awareness of AI tools was high among both groups, actual usage showed a clear gap.

- **88% of students** had used at least one AI tool,
- But only **48% of teachers** reported using AI for academic purposes.

This difference suggests the emergence of a **student-led AI adoption wave**, driven mainly by:

- accessibility of chatbots,
- exposure through social media,
- Curiosity about new technologies.

Teachers, on the other hand, face institutional and infrastructural barriers, along with apprehension regarding accuracy and ethical issues. This finding aligns with global patterns reported by UNESCO (2023) and OECD (2022), where younger learners adopt AI tools faster than educators.

AI holds immense potential to modernize commerce education by enhancing individual learning experiences, improving teaching effectiveness, and preparing learners for digitally driven industries. While awareness and acceptance levels are high, strategic investments in training and infrastructure are essential for sustainable AI integration.

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Questionnaire for Data Collection

Section A: Demographic Information

1. Name (Optional):
2. Age:
3. Gender:
4. Category:
 - ☐ Student
 - ☐ Teacher
5. Educational Level:
 - ☐ Undergraduate
 - ☐ Postgraduate
 - ☐ Faculty (Assistant/Associate/Professor)

Section B: Awareness of AI

6. How familiar are you with AI tools?
 - ☐ Very High

- ☐ High
- ☐ Moderate
- ☐ Low
- ☐ Very Low

7. Which AI tools have you used? (Multiple choice)

- ☐ ChatGPT
- ☐ Google Gemini
- ☐ MS Excel AI Features
- ☐ Accounting/Finance AI Tools
- ☐ Learning Apps (Byju's AI, Coursera AI, etc.)

Section C: Perceptions of AI in Commerce Education

(5-point Likert Scale: 1=Strongly Disagree, 5=Strongly Agree)

- 8. AI improves conceptual understanding.
- 9. AI enhances classroom interactivity.
- 10. AI supports personalized learning.
- 11. AI reduces the workload of teachers.
- 12. AI helps students learn complex commerce concepts.
- 13. AI improves evaluation and feedback.

Section D: Challenges in AI Usage

- 14. Lack of training limits my use of AI.
- 15. Poor internet and infrastructure affect AI adoption.
- 16. I have concerns about data privacy and security.
- 17. AI may replace some traditional teaching roles.
- 18. My institution does not provide enough AI-based facilities.

Section E: Open-Ended Questions

- 19. What benefits do you see in using AI for commerce education?
- 20. What challenges or risks concern you the most?
- 21. What suggestions would you give to improve AI usage in your institution?