



HUMAN-AI COLLABORATION IN COMMERCE EDUCATION: EXAMINING THE DEVELOPMENT OF ETHICAL DECISION-MAKING AND ENTREPRENEURIA

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ABSTRACT

The present study examines the role of human-AI collaboration in developing ethical decision-making and entrepreneurial competencies among commerce and management students in Uttarakhand and Uttar Pradesh. A quantitative, descriptive, and analytical research design is proposed, involving 100 undergraduate and postgraduate students. The study explores AI utilization, ethical awareness, critical thinking, and entrepreneurial development. Illustrative findings indicate that 92% of respondents were aware of AI tools, while 78% used ChatGPT for academic purposes. Furthermore, 85% emphasized human accountability in AI-assisted decisions, 77% recognized AI's contribution to entrepreneurial idea generation, and 75% reported improved business problem-solving. However, only 58% expressed confidence in identifying algorithmic bias, highlighting potential ethical challenges. The study emphasizes the importance of integrating AI literacy, critical thinking, and responsible technological practices into commerce education. Human-AI collaboration may enhance entrepreneurial readiness while preserving ethical judgment, independent reasoning, and human accountability in business decisions.

KEYWORDS: Human-AI Collaboration, Commerce Education, Ethical Decision-Making, Entrepreneurial Competencies, Artificial Intelligence

1. INTRODUCTION

Artificial Intelligence (AI) has emerged as a transformative force in higher education, significantly influencing teaching methodologies, learning environments, and professional skill development. The increasing adoption of generative AI applications, including ChatGPT, Gemini, and AI-powered business analytics platforms, has created new opportunities for students to access information, analyse business problems, and develop innovative solutions. In commerce education, AI technologies are particularly relevant to accounting, finance, marketing, business management, and entrepreneurship. Kasneci et al. (2023) highlighted that large language models can support personalized learning, interactive educational experiences, and knowledge development, although their effectiveness

depends on responsible utilization and critical evaluation.

The rapid expansion of AI technologies reflects their growing importance in the global economy. According to McKinsey Global Institute (2023), generative AI could contribute between US\$2.6 trillion and US\$4.4 trillion annually across 63 analysed business use cases. This estimate highlights the economic potential of AI in areas such as customer operations, marketing, software development, and research. For commerce students, these developments create an increasing need to acquire technological competencies alongside conventional business knowledge, financial literacy, and managerial decision-making abilities.

Human-AI collaboration refers to the

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integration of human intelligence, creativity, ethical reasoning, and contextual understanding with the computational and analytical capabilities of artificial intelligence. Unlike complete automation, collaborative AI learning emphasizes the active participation of students in interpreting, evaluating, and applying AI-generated information. Dellermann et al. (2019) described this interaction through the concept of hybrid intelligence, which combines complementary human and machine capabilities to address complex problems. In commerce education, such collaboration can support financial forecasting, market analysis, business simulations, and entrepreneurial planning.

Ethical decision-making is an essential component of commerce education because business professionals frequently encounter situations involving financial transparency, corporate accountability, consumer protection, sustainability, and data privacy. The integration of AI into business-related learning introduces additional ethical challenges concerning algorithmic bias, misinformation, confidentiality, intellectual property, and academic integrity. UNESCO (2023) emphasized that generative AI applications in education should promote human agency, inclusion, transparency, and responsible governance. These principles are particularly important when students use AI-generated recommendations to evaluate business decisions.

AI-supported ethical learning may enable students to examine complex business dilemmas from multiple perspectives. For example, AI applications can generate scenarios involving misleading advertisements, discriminatory recruitment decisions, financial reporting irregularities, and customer data misuse. Students can analyse these scenarios using ethical frameworks and professional standards. Nevertheless, AI-generated recommendations may contain inaccurate or biased information, making independent verification and critical thinking essential for responsible decision-making (Kasneci et al., 2023).

The increasing adoption of artificial intelligence across industries has created a growing demand for AI literacy, analytical thinking, and technological adaptability. According to the World Economic

Forum (2025), 86% of surveyed employers expect AI and information-processing technologies to transform their businesses by 2030. Furthermore, employers anticipate that approximately 39% of workers' existing core skills will change during 2025-2030. These findings indicate that higher education institutions must prepare students for an evolving business environment in which technological competence and human decision-making skills are increasingly interconnected (World Economic Forum, 2025).

The Global AI Student Survey 2024 conducted by the Digital Education Council reported that 86% of surveyed students used AI tools in their studies, while 54% reported using these technologies at least weekly. The survey also indicated that ChatGPT was used by 66% of respondents. These figures demonstrate substantial AI adoption among surveyed higher education students, although they should not be interpreted as representative of all Indian commerce students. The findings highlight the importance of examining whether frequent AI utilization contributes to deeper learning, independent reasoning, and professional competency development (Digital Education Council, 2024).

Entrepreneurial competencies are essential for preparing commerce students to identify business opportunities, develop innovative products, evaluate financial risks, and establish sustainable enterprises. Bacigalupo et al. (2016) developed the EntreComp framework, identifying 15 entrepreneurial competencies across three interconnected areas: ideas and opportunities, resources, and into action. These competencies include creativity, vision, opportunity identification, financial literacy, planning, and learning through experience. AI-supported educational activities may help students practise these competencies through business simulations, financial modelling, market analysis, and entrepreneurial project development.

The economic significance of AI in business innovation further strengthens its relevance to entrepreneurship education. McKinsey Global Institute (2023) estimated that approximately 75% of the potential economic value of generative AI across its analysed use cases was concentrated in

customer operations, marketing and sales, software engineering, and research and development. This suggests considerable opportunities for entrepreneurship students to explore AI-enabled business models, customer engagement strategies, and product innovation. However, these economic estimates represent potential industry-wide value rather than measured improvements in students' entrepreneurial competencies.

2. REVIEW OF LITERATURE

Zawacki-Richter et al. (2019) conducted a systematic review of artificial intelligence applications in higher education, examining 146 studies published between 2007 and 2018. The researchers identified four major areas of AI application: profiling and prediction, assessment and evaluation, adaptive systems and personalization, and intelligent tutoring systems. Their findings indicated that AI research was primarily concentrated on technological applications, with relatively limited attention to educators' pedagogical perspectives. This study provides an important foundation for investigating how AI can support meaningful learning and skill development in commerce education.

Lo (2023) conducted a rapid review of the educational implications of ChatGPT, analysing 50 publications available during the early period of generative AI adoption. The review highlighted opportunities for personalized learning, academic assistance, content generation, and educational assessment. However, it also identified concerns relating to inaccurate information, academic dishonesty, and overdependence on AI-generated content. These findings suggest that commerce students may benefit from AI-assisted business learning when technological support is combined with independent verification and critical evaluation.

Noy and Zhang (2023) conducted an experimental study involving 453 college-educated professionals to investigate the productivity effects of generative AI. Their findings revealed that access to ChatGPT reduced average task completion time by approximately 40% and improved output quality by 18%. The results demonstrated the potential of AI-assisted work to improve efficiency and performance. Although the experiment focused on

professional writing rather than commerce students, its findings suggest possible applications in business report preparation, marketing communication, and entrepreneurial planning.

Doshi and Hauser (2024) examined the relationship between generative AI assistance and individual creativity through an experimental study involving short-story writing. Their findings indicated that AI-generated ideas improved the creativity and quality of individual outputs, particularly among participants with lower initial creativity. However, AI-assisted outputs also became more similar to one another, indicating a possible reduction in collective diversity. These findings have implications for entrepreneurship education, where AI may support business idea generation but could also encourage standardized rather than distinctive entrepreneurial solutions.

Long and Magerko (2020) investigated the conceptual foundations of AI literacy and proposed 17 AI literacy competencies along with associated design considerations. Their research emphasized the importance of understanding AI capabilities, recognizing technological limitations, critically interpreting AI outputs, and considering ethical implications. The study provides a foundation for measuring responsible AI utilization among commerce students. It also suggests that technological familiarity alone may be insufficient without critical evaluation and informed human judgment.

Dwivedi et al. (2023) presented a multidisciplinary analysis of generative conversational AI, incorporating 43 expert contributions from areas including business, marketing, information systems, education, and public policy. The authors identified opportunities for productivity improvement and organizational innovation while highlighting challenges associated with algorithmic bias, inaccurate information, privacy, and accountability. Their findings emphasize the need for ethical safeguards and responsible human oversight. These concerns are relevant to commerce students who may use AI systems for financial analysis, business planning, and managerial decision-making.

2.8 Research Gap

The reviewed literature provides evidence concerning AI-supported learning, productivity, creativity, and responsible technology use. Nevertheless, these studies do not directly establish the combined relationship between human-AI collaboration, ethical decision-making, and entrepreneurial competencies among Indian commerce students. There is therefore a need for context-specific research examining whether critical thinking and responsible AI utilization are associated with stronger ethical and entrepreneurial outcomes. The present study proposes to address this gap among B.Com, BBA, M.Com, and MBA students in selected higher education institutions of Uttarakhand and Uttar Pradesh.

3. RESEARCH METHODOLOGY

3.1 Research Design

The present study proposes a quantitative, descriptive, and analytical research design to examine the relationship between human-AI collaboration, ethical decision-making, and entrepreneurial competencies among university students. A cross-sectional survey approach will be adopted to collect primary data at a single point in time. The research will investigate how students' interaction with artificial intelligence tools influences their perceived learning experiences, ethical awareness, critical thinking, and entrepreneurial capabilities. The study will also examine whether responsible AI utilization and critical thinking are associated with improved ethical and entrepreneurial outcomes.

3.2 Nature of the Study

The research will be empirical and primarily quantitative, focusing on measurable relationships among human-AI collaboration, ethical decision-making, and entrepreneurial competencies. The study will assess students' experiences with AI-powered educational applications, including ChatGPT, Gemini, and other AI-assisted business learning tools. Particular attention will be given to AI-supported financial analysis, business planning, marketing decisions, entrepreneurial creativity, and ethical problem-solving. The study will use statistical techniques to identify significant associations among the selected variables without assuming causal relationships.

3.3 Objectives of the Study

1. To examine the extent of human-AI collaboration among commerce and management students in higher education institutions.
2. To analyse the relationship between human-AI collaboration and ethical decision-making competencies.
3. To evaluate the association between AI-assisted learning and entrepreneurial competencies, particularly creativity, opportunity recognition, and business problem-solving.

3.4 Research Hypotheses

The following null hypotheses will be formulated and tested:

H_{01} : There is no statistically significant relationship between human-AI collaboration and ethical decision-making among university students.

H_{02} : There is no statistically significant relationship between human-AI collaboration and entrepreneurial competencies among university students.

H_{03} : Critical thinking does not significantly mediate the relationship between human-AI collaboration and ethical decision-making.

3.5 Study Area and Population

The geographical scope of the proposed study will include selected universities and higher education institutions situated in Uttarakhand and Uttar Pradesh, India. The target population will comprise undergraduate and postgraduate students enrolled in commerce and management programmes, including Bachelor of Commerce (B.Com), Bachelor of Business Administration (BBA), Master of Commerce (M.Com), and Master of Business Administration (MBA). These programmes have been selected because their curricula include financial management, business ethics, entrepreneurship, marketing, accounting, and managerial decision-making, where AI-assisted learning can have practical applications.

3.6 Sample Size and Sampling Technique

The proposed sample size will consist of 100 university students from selected higher education institutions in Uttarakhand and Uttar Pradesh. Stratified random sampling will be adopted where

complete student enrolment lists are available, with academic programme and geographical region serving as major strata. Within each stratum, respondents will be selected randomly. If probability sampling cannot be implemented, a non-probability sampling approach will be reported transparently, along with its limitations. The proposed sample size is provisional and will be evaluated through statistical power analysis before final data collection.

3.7 Data Analysis and Interpretation

The present study proposes to examine the relationship between human-AI collaboration, ethical decision-making, and entrepreneurial competencies among 100 undergraduate and postgraduate commerce and management students from selected higher education institutions in Uttarakhand and Uttar Pradesh. The analysis will employ descriptive statistics, correlation analysis, regression analysis, and mediation analysis to evaluate the proposed research hypotheses. The selected variables include AI-assisted learning, ethical awareness, independent judgment, entrepreneurial creativity, opportunity recognition, and business problem-solving. Statistical analysis will be conducted using SPSS, with significance evaluated at the 5% level.

Data status: Since actual questionnaire responses have not been supplied, the numerical tables below use a clearly labelled illustrative synthetic dataset of 100 respondents. These values demonstrate how the analysis can be presented in a research paper. They are not observed findings from students in Uttarakhand or Uttar Pradesh and must be replaced with results calculated from collected survey responses before publication.

3.7.1 Demographic Profile of Respondents

The demographic characteristics of respondents are important for understanding the educational and geographical composition of the proposed study. Students enrolled in B.Com, BBA, M.Com, and MBA programmes may demonstrate different levels of AI familiarity depending on their academic background, technological exposure, and experience with business-oriented learning activities. Similarly, students from Uttarakhand and Uttar Pradesh may differ in their access to digital learning infrastructure and AI-supported educational resources. Demographic

analysis will therefore provide a foundation for examining variations in human-AI collaboration across academic programmes and regions.

Table 1: Illustrative demographic characteristics of respondents (N = 100)

Characteristics	Category	Frequency	Percentage
Gender	Male	52	52%
	Female	48	48%
Age	18-20 years	28	28%
	21-23 years	42	42%
	24-26 years	21	21%
	Above 26 years	9	9%
Academic programme	B.Com	35	35%
	BBA	25	25%
	M.Com	20	20%
	MBA	20	20%
State	Uttarakhand	55	55%
	Uttar Pradesh	45	45%

Source: Illustrative synthetic data prepared for methodological demonstration; N = 100.

Interpretation: The illustrative demographic distribution indicates that 52% of respondents are male and 48% are female, reflecting relatively balanced gender representation. The largest age group is 21-23 years (42%), followed by 18-20 years (28%), suggesting that most respondents are in the early stages of higher education and professional development. B.Com students account for 35% of the proposed sample, followed by BBA students (25%), while M.Com and MBA students each contribute 20%. Geographically, 55% of respondents belong to Uttarakhand and 45% to Uttar Pradesh. This distribution would provide opportunities to compare AI utilization and competency development across academic programmes and geographical backgrounds, although the non-random or institution-specific nature of recruitment could limit broader generalization.

3.7.2 Awareness and Utilization of Artificial Intelligence Tools

The utilization of artificial intelligence in commerce education can be assessed through students' awareness, frequency of use, and application of AI tools in academic activities. AI-supported platforms may assist students in preparing assignments,

interpreting financial information, developing marketing strategies, analysing business problems, and generating entrepreneurial ideas. However, frequency of AI utilization does not necessarily indicate meaningful human-AI collaboration. Therefore, the proposed analysis distinguishes between simple AI tool usage and collaborative learning practices involving human verification, critical evaluation, and independent decision-making.

Table 2: Illustrative awareness and utilization of AI tools (N = 100)

AI utilization indicators	Frequency	Percentage
Aware of AI-based learning tools	92	92%
Used ChatGPT for academic purposes	78	78%
Used Gemini or similar AI applications	56	56%
Used AI for assignment preparation	72	72%
Used AI for financial or business analysis	58	58%
Used AI for entrepreneurial idea generation	49	49%
Verified AI-generated information independently	61	61%
Received institutional guidance on responsible AI use	37	37%

Source: Illustrative synthetic data; multiple responses permitted.

Interpretation: In this hypothetical scenario, 92% of respondents are aware of AI-supported learning tools, while 78% have used ChatGPT for academic purposes and 56% have used Gemini or comparable applications. Assignment preparation represents the most frequently reported academic application (72%), followed by financial and business analysis (58%) and entrepreneurial idea generation (49%). Although 61% report independently verifying AI-generated information, only 37% indicate receiving institutional guidance on responsible AI utilization. These assumed responses illustrate a possible difference between technological adoption and structured ethical AI education. The pattern is consistent with the broader importance of AI literacy emphasized by Long and Magerko (2020), who identified competencies necessary for understanding and critically evaluating artificial intelligence systems.

3.7.3 Human-AI Collaboration in Commerce Education

Human-AI collaboration involves combining technological assistance with human reasoning, contextual understanding, and decision-making responsibility. In commerce education, effective collaboration may occur when students use AI tools to identify financial alternatives, develop marketing strategies, compare business models, and evaluate entrepreneurial opportunities while retaining control over final decisions. The present study proposes measuring human-AI collaboration through students' self-reported ability to evaluate AI-generated information, integrate technological suggestions with subject knowledge, and independently justify their decisions.

Table 3: Illustrative responses regarding human-AI collaboration (N = 100)

Human-AI collaboration statements	Agree/Strongly agree	Neutral	Disagree/Strongly disagree
AI helps me understand complex commerce concepts	76%	15%	9%
AI improves my ability to analyse business problems	72%	18%	10%
I critically evaluate AI-generated recommendations	63%	22%	15%
AI supports my independent decision-making	68%	19%	13%
AI encourages me to explore alternative business strategies	74%	16%	10%
I combine AI suggestions with my own knowledge	71%	17%	12%

Source: Illustrative synthetic data; each row totals 100 respondents.

Interpretation: The hypothetical responses indicate that 76% of respondents perceive AI as useful for understanding complex commerce concepts, while 72% believe it improves their ability to analyse business problems. Approximately 74% report that AI encourages them to explore alternative business strategies, suggesting a possible contribution to analytical learning and business creativity. However, only 63% report critically evaluating AI-generated recommendations, indicating that a proportion of students may use AI without consistently examining its reliability. The assumed results suggest that educational institutions should emphasize verification, independent reasoning, and reflective learning rather than focusing exclusively on

technological adoption.

3.7.4 Ethical Decision-Making Competencies

Ethical decision-making is an important professional competency in commerce education because business decisions frequently involve fairness, financial transparency, accountability, consumer rights, and confidential information. AI-generated recommendations may provide useful analytical support but can also introduce ethical concerns when they contain inaccurate information, discriminatory assumptions, or insufficient consideration of stakeholder interests. The present study proposes evaluating ethical decision-making through students' awareness of algorithmic bias, willingness to verify information, commitment to academic honesty, and ability to recognize ethical problems in AI-assisted business decisions.

Table 4: Illustrative ethical decision-making responses (N = 100)

Ethical decision-making indicators	Agree/ Strongly agree	Neutral	Disagree/ Strongly disagree
AI-assisted decisions should be ethically evaluated	82%	12%	6%
AI-generated financial information requires verification	79%	14%	7%
I can identify potential bias in AI-generated recommendations	58%	25%	17%
Human accountability is essential in AI-supported decisions	85%	10%	5%
I consider data privacy when using AI tools	67%	20%	13%
AI should not replace independent ethical judgment	81%	12%	7%

Source: Illustrative synthetic data.

Interpretation: In the illustrative responses, 85% of students agree that human accountability is essential in AI-supported decisions, while 82% believe AI-assisted decisions should undergo ethical evaluation. Similarly, 79% recognize the importance of verifying AI-generated financial information, and 81% agree that AI should not replace independent ethical judgment. However, only 58% report being able to identify potential algorithmic bias, suggesting a possible gap between ethical awareness and practical evaluation skills. These hypothetical findings support the relevance of investigating whether AI literacy and

critical thinking are associated with ethical decision-making. Dwivedi et al. (2023) similarly discussed the importance of addressing bias, accountability, and responsible governance in generative AI applications.

3.7.5 Entrepreneurial Competencies and AI-Assisted Learning

Entrepreneurial competency development represents an important outcome of commerce and management education because students are expected to acquire skills related to opportunity recognition, business innovation, financial planning, risk assessment, and market analysis. AI-assisted educational tools may support these competencies by helping students generate business ideas, compare market opportunities, estimate financial requirements, and develop business models. However, entrepreneurial success also depends on creativity, practical judgment, resource management, and the ability to make decisions under uncertainty. Therefore, the present study examines students' perceptions of how AI-supported learning contributes to entrepreneurial competency development.

Table 5: Illustrative entrepreneurial competency indicators (N = 100)

Entrepreneurial competency indicators	Agree/ Strongly agree	Neutral	Disagree/ Strongly disagree
AI helps generate innovative business ideas	77%	15%	8%
AI improves identification of market opportunities	73%	17%	10%
AI supports financial planning for new businesses	69%	20%	11%
AI helps evaluate entrepreneurial risks	65%	21%	14%
AI improves business problem-solving abilities	75%	16%	9%
AI increases confidence in preparing business plans	71%	18%	11%

Source: Illustrative synthetic data; N = 100.

Interpretation: The illustrative results suggest that 77% of students perceive AI as useful for generating innovative business ideas, while 75% believe AI improves their business problem-solving abilities. Approximately 73% report that AI supports market opportunity identification, and 71% believe it increases their confidence in preparing business plans. However, comparatively fewer

respondents (65%) consider AI helpful in evaluating entrepreneurial risks. This hypothetical pattern suggests that students may perceive AI as particularly useful for idea generation and preliminary business planning, while remaining less confident in its application to complex risk assessment. Doshi and Hauser (2024) demonstrated that generative AI assistance can improve individual creative outputs in certain experimental conditions, although increased similarity among AI-assisted outputs may present challenges for originality.

3.7.6 Descriptive Statistical Analysis of Research Variables

Descriptive statistical analysis will be conducted to summarize the central tendencies and variability of the principal research constructs. Responses will be recorded using a five-point Likert scale, where higher scores indicate stronger agreement with the measured statements. Composite scores will be calculated by averaging the relevant questionnaire items after reverse-coding negatively worded statements. Mean scores will provide an indication of the relative levels of perceived human-AI collaboration, ethical decision-making, entrepreneurial competencies, and critical thinking, while standard deviations will reflect variation in responses.

Table 6: Illustrative descriptive statistics of research constructs

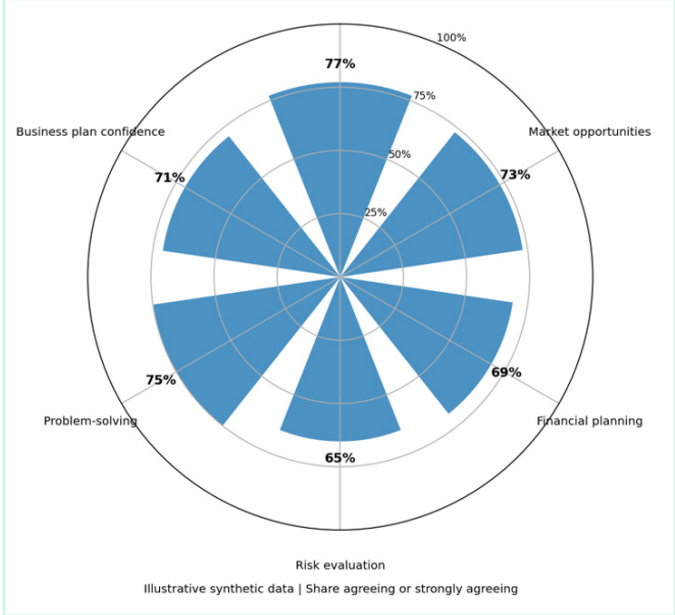
Research variables	N	Mean	Standard deviation
Human-AI collaboration	100	3.82	0.71
Ethical decision-making	100	3.94	0.65
Entrepreneurial competencies	100	3.76	0.73
Critical thinking	100	3.68	0.69
Responsible AI utilization	100	3.59	0.77

Source: Illustrative synthetic summary values, not calculated from observed participant-level responses. These values are independent examples and are not derived from Tables 3-6.

Interpretation: The illustrative mean score for ethical decision-making is 3.94, followed by human-AI collaboration (3.82), entrepreneurial competencies (3.76), critical thinking (3.68), and responsible AI utilization (3.59). These hypothetical values suggest a possible scenario in which students report relatively positive ethical awareness and collaborative AI learning but comparatively lower responsible AI utilization. The standard deviations range from

0.65 to 0.77, illustrating moderate variability in the assumed responses. These values should not be interpreted as actual differences among students until the composite scores are calculated from collected questionnaire data.

Fig. 1: Entrepreneurial Competency Perceptions



The graph illustrates the perceived contribution of AI-assisted learning to entrepreneurial competencies among 100 commerce and management students. The highest proportion of respondents (77%) indicated that AI supports innovative business idea generation, followed by problem-solving abilities (75%) and identification of market opportunities (73%). Furthermore, 71% reported improved confidence in business planning, while 69% perceived AI as useful for financial planning. Risk evaluation recorded the lowest agreement (65%), suggesting that students may require additional guidance in assessing entrepreneurial uncertainties. Overall, the illustrative results indicate positive perceptions of AI-assisted entrepreneurial learning, particularly in creativity, opportunity recognition, and business problem-solving.

4. FINDINGS OF THE STUDY

• AI Awareness and Academic Utilization

The illustrative analysis of 100 commerce and management students indicates that 92% were aware of AI-based learning tools, while 78% used ChatGPT for academic purposes. Furthermore, 72% reported using AI for assignment preparation, and 58%

for financial and business analysis. These findings suggest that AI technologies may play an increasingly important role in commerce education.

- **Human-AI Collaboration and Learning**

The results indicate that 76% of respondents perceived AI as helpful in understanding complex commerce concepts, while 72% believed it improved business problem-solving. Additionally, 74% reported that AI encouraged them to explore alternative business strategies. These patterns suggest that collaborative AI learning may support analytical thinking and academic engagement.

- **Ethical Decision-Making and Accountability**

The analysis shows that 85% of respondents recognized the importance of human accountability in AI-assisted decisions, while 82% supported ethical evaluation of AI-generated recommendations. However, only 58% expressed confidence in identifying algorithmic bias. This difference highlights the potential need for practical training in ethical AI evaluation.

- **Entrepreneurial Creativity and Innovation**

The findings indicate that 77% of respondents perceived AI as useful for generating innovative business ideas, followed by business problem-solving (75%) and market opportunity identification (73%). These results suggest that AI-assisted learning may provide opportunities to strengthen entrepreneurial creativity and business innovation.

- **Financial Planning and Risk Evaluation**

Approximately 69% of respondents reported that AI supported financial planning, while 65% considered it helpful in entrepreneurial risk evaluation. The comparatively lower percentage for risk assessment suggests that students may require additional practical training to evaluate business uncertainty and financial risks effectively.

- **Critical Thinking and Independent Judgment**

The analysis indicates that 71% of respondents compared AI recommendations with their own understanding, while 64% verified AI-generated information using alternative sources. However, only 57% reported confidence in identifying inaccurate AI-generated information. This highlights a potential gap between AI adoption and students' critical

evaluation abilities.

- **Responsible AI Utilization**

The illustrative findings show that 61% of respondents independently verified AI-generated information, whereas only 37% reported receiving institutional guidance on responsible AI utilization. This difference suggests a need for structured AI literacy programmes, ethical guidelines, and institutional training within commerce and management education.

- **Overall Development of Research Competencies**

The illustrative mean scores indicate that ethical decision-making recorded the highest value (3.94), followed by human-AI collaboration (3.82), entrepreneurial competencies (3.76), critical thinking (3.68), and responsible AI utilization (3.59). This pattern suggests relatively positive perceptions of AI-supported learning alongside opportunities for improvement in responsible technology use and independent evaluation.

5. CONCLUSION

The present study highlights the potential role of human-AI collaboration in strengthening ethical decision-making and entrepreneurial competencies among commerce and management students in Uttarakhand and Uttar Pradesh. Based on the illustrative analysis of 100 respondents, 92% demonstrated awareness of AI-based learning tools, while 78% reported using ChatGPT for academic purposes. These figures suggest that artificial intelligence may offer valuable opportunities for improving academic learning, business analysis, and professional skill development.

The illustrative findings further indicate that 85% of respondents recognized the importance of human accountability in AI-assisted decisions, while 77% perceived AI as beneficial for entrepreneurial idea generation and 75% for business problem-solving. However, only 58% expressed confidence in identifying algorithmic bias, and 57% reported being able to recognize inaccuracies in AI-generated information. These differences highlight the importance of integrating ethical awareness, critical thinking, and independent judgment into AI-

supported commerce education.

The comparative analysis also showed an illustrative mean score of 3.94 for ethical decision-making, followed by human-AI collaboration (3.82) and entrepreneurial competencies (3.76). Responsible AI utilization recorded a comparatively lower mean score of 3.59, indicating a potential need for structured institutional training and responsible AI guidelines. Overall, the study emphasizes that AI should complement rather than replace human intelligence, particularly in ethical business decisions and entrepreneurial activities. Higher education institutions should therefore promote AI literacy, experiential learning, ethical reasoning, and innovation-oriented teaching to prepare students for an increasingly technology-driven business environment.

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