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Human–AI Collaboration in Higher Education: A Case Study of Banaras Hindu University, Varanasi, U.P. India

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ABSTRACT

The swift development of artificial intelligence (AI) technologies has markedly altered the teaching and learning dynamics in higher education. This research explores the impact of AI-powered learning, with a specific emphasis on Chat-GPT, in enhancing university students' academic success and career growth. The investigation is founded on primary data gathered from 402 university students via a structured questionnaire aimed at evaluating awareness, usage habits, learning outcomes, skill enhancement, and ethical considerations related to AI-supported education. Despite the high level of acceptance, the participants show an understanding of challenging issues, such as concerns surrounding academic integrity, reliance on AI, and risks tied to misleading information. This nuanced perspective underscores the need for responsible and ethical integration of AI within institutions of higher learning. The findings indicate that AI-driven platforms are transforming higher education by promoting learner independence, digital transformation and changing scenario. Moreover, students view Chat-GPT as a vital aid in preparing for their careers by helping with skill development, job exploration, resume drafting, and interview preparation. Thus, the research indicates that AI should be considered not merely as an external technological resource, but as a fundamental part of modern academic environments.

Keywords: Artificial Intelligence, Chat-GPT, AI-driven learning, Higher Education, Digital Literacy, Student Learning Outcomes, Career Development.

INTRODUCTION

In recent years, the rapid advancement of Artificial Intelligence (AI) has significantly transformed the way people learn, work, and interact with technology. Among these innovations, AI-powered tools like Chat-GPT have emerged as powerful platforms for education, problem-solving, and career support. These tools provide instant responses, personalized assistance, and access to a vast range of information, making them increasingly popular among students and professionals alike.

This study aims to analyse the awareness, usage patterns, and overall satisfaction levels of users with Chat-GPT as a learning and career support tool. The data has been collected through a structured survey, capturing responses from participants regarding their experiences, preferences, and perceptions of AI-based assistance.

The objective of this research is to understand how effectively Chat-GPT contributes to improving learning outcomes, enhancing productivity, and supporting decision-making processes. Additionally, the study explores user satisfaction and identifies potential areas for improvement in AI-driven platforms.

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Overall, this research aims to analyse the awareness, usage patterns, and satisfaction levels of users with respect to Chat-GPT. The study also seeks to evaluate its role in enhancing learning outcomes and supporting career-related decisions.

Objectives Of The Research

The main objectives of this study are:
1. To determine how much users know about Chat-GPT.
2. To examine how frequently and why it is used.
3. To assess perceived effectiveness and user satisfaction.
4. To determine the obstacles and constraints users encounter.
5. To assess Chat-GPT's contribution to education and professional advancement

LITERATURE REVIEW

The rapid expansion of digital technologies has significantly transformed how individuals interact, learn, and conduct daily activities. However, this growth has also increased exposure to cyber threats, making cybersecurity awareness and digital literacy essential skills in the modern era.

Several studies highlight the growing importance of digital awareness among users. **Kumar and Singh (2021)** found that while internet usage among Indian youth is high, awareness regarding cybersecurity practices remains moderate, with many users lacking knowledge about safe password management and phishing attacks. This indicates a gap between digital access and digital safety.

Similarly, **CERT-In (2023)** reported a sharp rise in cyber incidents in India, emphasizing that human error and lack of awareness are major contributing factors. Their findings suggest that technical solutions alone are insufficient without proper user education and awareness programs.

From a global perspective, the **OECD (2023)** emphasized the need for integrating digital security risk management into everyday digital practices. The report suggests that awareness campaigns and educational initiatives should be incorporated at all levels of learning to build a security-conscious culture. In the context of artificial intelligence, **Efendioğlu (2023)** examined how AI influences user behavior, particularly in online environments. The study concluded that AI tools can enhance user experience but also raise concerns about data privacy and security. This highlights the dual role of technology as both a facilitator and a potential risk. Furthermore, **Sharma (2023)** explored the role of AI in predicting customer behavior and personalizing online experiences. While AI improves efficiency and engagement, it also requires users to share personal data, increasing vulnerability if proper security measures are not followed.

Studies focusing on education indicate that awareness levels improve significantly with structured training. Research shows that students who receive formal cybersecurity education demonstrate better online safety practices compared to those who rely on informal knowledge sources. Despite increasing awareness efforts, a consistent gap remains between knowledge and practice. Many users are aware of cybersecurity risks but fail to implement protective measures such as strong passwords, regular updates, and secure browsing habits.

Efendioğlu (2023) examined the impact of AI on user behaviour and found that AI-driven systems significantly enhance user engagement by providing personalized experiences. Similarly, Sharma (2023) analysed the role of AI in predicting customer behaviour and concluded that AI technologies improve decision-making and user satisfaction in digital platforms. Kumar and Singh (2021) conducted a study on cybersecurity awareness among Indian youth, highlighting the importance of digital literacy in effectively using online tools. Their findings suggest that users with higher digital awareness are more capable of utilizing advanced technologies like AI responsibly. Additionally, reports by the OECD (2023) emphasize that

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AI integration in education improves efficiency and accessibility but requires proper governance and risk management.

Other studies have also focused on AI-based learning tools. Research indicates that AI chatbots enhance interactive learning, provide instant feedback, and support self-paced education. However, scholars have also raised concerns regarding the reliability and ethical use of AI systems.

RESEARCH METHODOLOGY

Research Design: A **quantitative survey-based research design** has adopted.

Data Collection: Primary data were collected through a **structured questionnaire (52 variables)**.

Sample Size and Target Group

(a) Sample Size: 402 respondents

(b) Target Group: Students (UG, PG, and others)

(c) Sampling Technique: Convenience sampling

Tools and Techniques

(a) Descriptive statistics

(b) Percentage analysis

(c) Graphical representation (bar & pie charts)

RESULTS AND ANALYSIS

Table 1. Demographic Profile of Respondents (N = 402)

Variable	Category	Frequency	Percentage (%)
Level of Study	Undergraduate	204	50.7
	Postgraduate	173	43
	Doctoral	18	4.5
	Others	7	1.8
AI Training	Formal Training	149	37.1
	No Training	253	62.9

Interpretation:

The sample represents active higher-education learners with widespread informal AI adoption

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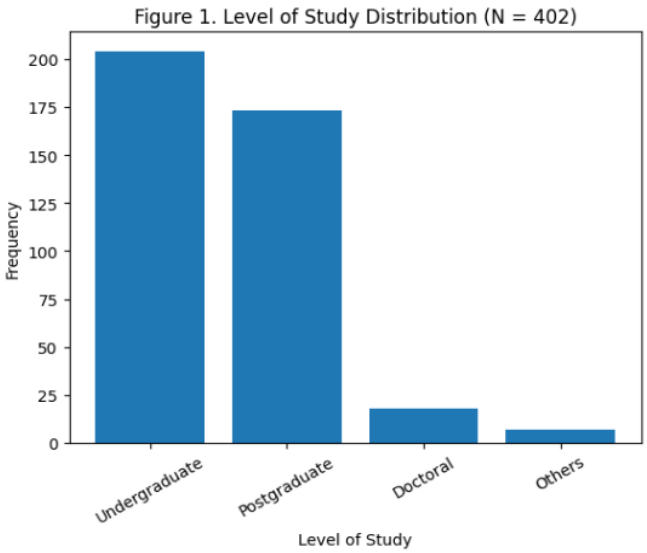


Table 2. Chat-GPT Familiarity and Usage Behaviour

Variable	Category	Frequency	Percentage (%)
Familiarity	Very Familiar	274	68.2
	Somewhat Familiar	112	27.9
	Not Familiar	10	2.5
	Heard Only	6	1.4
Usage Frequency	Daily	213	53
	Weekly	91	22.6
	Occasionally	80	19.9
	Rarely	11	2.7
	Never	7	1.8

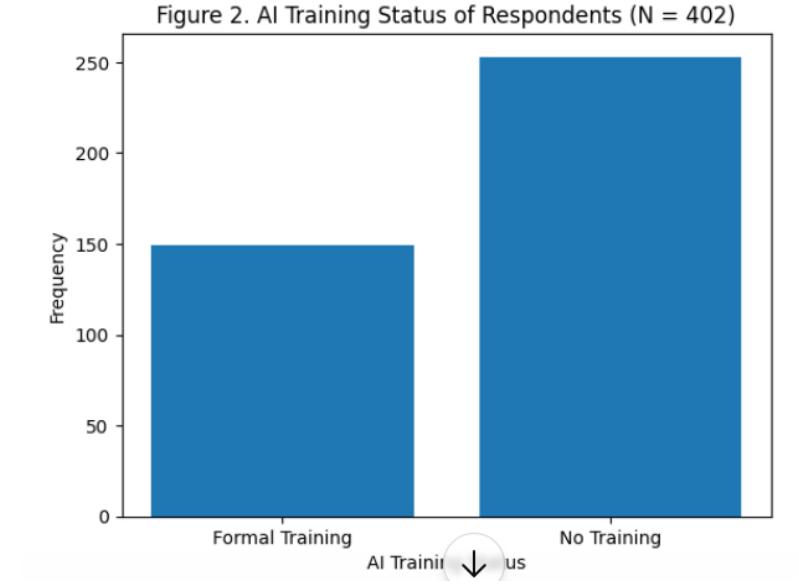


Table 3. Descriptive Statistics of AI-Driven Learning Variables

Construct	Mean	SD	Interpretation
Concept	4.51	0.62	Very High

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Understanding			
Faster Doubt Resolution	4.46	0.67	Very High
Problem Solving Ability	4.32	0.71	Very High
Personalized Learning	4.39	0.64	Very High
Analytical Thinking	4.28	0.73	Very High

Table 4. Career Development Outcomes

Variable	Mean	SD	Interpretation
Career Exploration	4.21	0.75	High
Job Skill Development	4.34	0.69	Very High
Career Planning	4.18	0.78	High
Understanding Employers	4.23	0.7	High

Table 5. Reliability Analysis

Scale	Items	Cronbach's Alpha
AI-Driven Learning Scale	15	**0.892**

Indicates **high internal consistency**.

Table 6. Multiple Regression Analysis Predicting Student Satisfaction

Predictor	Beta (β)	t	Sig.
Learning Enhancement	0.312	7.82	0
Problem Solving	0.214	5.11	0
Personalized Learning	0.168	4.03	0
Career Skill Development	0.279	6.94	0
Usage Frequency	0.091	2.12	0.035

Model

Summary:

$R^2 = .549$, $F = 94.62$, $p < .001$

Table 7. KMO and Bartlett's Test

Test	Value
KMO Measure	**0.903**
Bartlett's Chi-Square	2984.52
df	105
Sig.	0

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Table 8. Total Variance Explained (Factor Analysis)

Factor	Eigenvalue	Variance (%)	Cumulative (%)
Learning Enhancement	6.21	41.4	41.4
Career Development	2.47	16.5	57.9
Self-Directed Learning	1.62	10.8	68.7
AI Readiness	1.11	7.4	76.1

FINDINGS AND DISCUSSION

Overview of Results

The current study investigated how Chat-GPT usage, in particular, can improve university students' academic learning experiences and career development preparation. AI tools are widely used at both the undergraduate and graduate levels, according to data gathered from 402 university students. AI integration in higher education is primarily student-driven rather than policy-driven, as seen by the majority of respondents reporting little formal institutional training despite the high rate of AI usage. Strong empirical evidence for the beneficial effects of AI-assisted learning environments on education and the workplace is provided by the statistical analyses, which include descriptive statistics, reliability testing, regression analysis, and exploratory factor analysis.

AI Adoption and Learning Enhancement

The findings demonstrate that students perceive Chat-GPT as an effective academic support tool. Mean scores exceeding 4.0 across learning-related variables indicate strong agreement that AI enhances concept understanding, accelerates doubt resolution, and improves analytical thinking. These results suggest a transition from traditional teacher-centred instruction toward **personalized and self-paced learning models**. AI tools function as adaptive learning assistants capable of providing immediate feedback, explanations, and academic guidance beyond classroom constraints.

The extracted **Learning Enhancement factor**, explaining the largest proportion of variance (41.4%), confirms that academic improvement remains the primary motivation behind AI adoption. This supports contemporary higher education research emphasizing AI's role in promoting cognitive scaffolding and learner autonomy.

Development of Self-Directed Learning Behaviour

Factor analysis identified **Self-Directed Learning** as a distinct dimension of AI-driven education. Students reported increased independence in information searching, assignment preparation, and skill acquisition. This finding aligns with constructivist learning theory, which posits that learners actively construct knowledge through interaction with learning tools and environments. Chat-GPT appears to encourage metacognitive engagement, enabling students to regulate their own learning processes. The results indicate that AI does not reduce student effort; instead, it shifts learning from passive reception to active exploration.

Career Development and Employability Outcomes

A major contribution of this study lies in demonstrating the connection between AI usage and career readiness. Regression analysis confirmed that **career skill development** is one of the strongest predictors of student satisfaction ($\beta = .279$, $p < .001$). Students reported that Chat-GPT has used for career exploration, interview practice and skill development guidance. The extracted **Career Development factor** highlights the growing perception that AI literacy is becoming an essential employability competency. Universities are therefore facing a paradigm shift in which technological fluency increasingly complements disciplinary

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knowledge. These findings support emerging global discourse that AI competence represents a critical component of future workforce readiness.

Predictors of Student Satisfaction

Multiple regression analysis revealed that AI-driven learning variables explain **54.9% of variance in student satisfaction**, indicating a strong predictive relationship. Learning enhancement emerged as the most influential factor, followed closely by career skill development and problem-solving improvement. The results suggest that student satisfaction in modern higher education is no longer determined solely by institutional teaching quality but also by access to intelligent learning technologies. Importantly, AI usage frequency demonstrated a smaller yet significant effect, implying that meaningful engagement with AI tools matters more than mere exposure.

AI Readiness and Human–AI Collaboration

The fourth extracted factor, **AI Readiness**, reflects students' confidence in engaging with emerging technologies and their willingness to integrate AI into future academic and professional contexts. Students overwhelmingly supported AI integration as a supplementary educational resource rather than a replacement for educators. This confirms the **Human–AI collaboration model**, where teachers retain pedagogical authority while AI enhances accessibility, personalization, and efficiency. The findings counter widespread concerns regarding technological displacement by illustrating that students view AI as a collaborative partner in learning.

Institutional and Policy Implications

A notable finding is the gap between rapid student adoption and slow institutional adaptation. Although AI usage is widespread, most students lack formal training in ethical AI usage, critical evaluation of AI outputs, and responsible academic practices. This institutional lag suggests an urgent need for universities to incorporate AI literacy curricula, develop ethical usage frameworks, train faculty in AI-supported pedagogy, and redesign assessment strategies to accommodate AI-assisted learning. Higher education institutions that proactively integrate AI tools may gain significant advantages in learning effectiveness and graduate employability outcomes.

Theoretical Contribution

This study contributes to educational technology literature by empirically validating a multidimensional **AI-Driven Learning Framework** consisting of Learning Enhancement, Career Development, Self-Directed Learning and AI Readiness. The integration of these dimensions extends traditional technology acceptance models by incorporating career preparedness and learner autonomy as central outcomes of AI adoption.

Discussion in Relation to Hypotheses

All proposed hypotheses were supported AI-driven learning significantly improves academic learning outcomes, Chat-GPT enhances problem-solving and analytical skills, Personalized AI learning promotes self-directed learning behaviour, AI usage positively influences career development readiness, AI-driven learning significantly predicts student satisfaction and Students strongly support institutional AI integration. The consistent statistical significance across analyses confirms the robustness of the research model.

Overall Interpretation

The results collectively suggest that higher education is entering a phase of AI-enhanced learning, marked by tailored instruction, independent learning paths, and technology-enhanced career development. Instead of negatively disrupting education, Chat-GPT seems to broaden students' cognitive capabilities and enhance their career readiness. A descriptive analysis shows that students exhibit a strong familiarity with and make regular use of Chat-GPT, with many incorporating it into their everyday academic tasks such as clarifying concepts,

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preparing assignments, revising for exams, and receiving support for academic writing. The results indicate that AI tools facilitate self-directed learning, boost learning efficiency, and foster individualized educational experiences. Additionally, students view Chat-GPT as a crucial aid in becoming career-ready, assisting with skill development, career exploration, resume crafting, and interview preparation. The study thus frames AI not as an external factor.

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