

Assessing Dependency and Impact of Artificial Intelligence on Learning Among Students

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Abstract

The rapid integration of generative artificial intelligence (GenAI) tools such as ChatGPT has transformed higher education, prompting concerns about student dependency and its effects on learning. This study aimed to assess undergraduate students' dependency on artificial intelligence and its perceived impact on learning at S.G.T. University, India.

A quantitative descriptive cross-sectional survey design was employed. Data were collected via a self-structured Google Form questionnaire from 99 respondents using non-probability convenience sampling. After removing one duplicate record, the final analytic sample comprised 98 valid consenting participants (n=98). The instrument included demographic details, AI usage patterns, five 5-point Likert-scale items measuring dependency and learning impact, and an overall opinion statement. Descriptive statistics, Cronbach's alpha, and Spearman rank-order correlations were computed using Microsoft Excel and JAMOWI.

Results showed that 94.9% of students used AI tools for academics, with ChatGPT being the most preferred (73.5%). The primary purpose was understanding difficult concepts (56.3%). Highest agreement was recorded for "AI saves time" ($M=3.67 \pm 1.24$) and "AI helps understand difficult topics" ($M=3.62 \pm 1.26$). While 55.1% endorsed AI as a supportive learning tool, moderate concern existed regarding reduced independent thinking ($M=3.48 \pm 1.22$). The Likert scale demonstrated good internal consistency (Cronbach's $\alpha=0.821$). Significant positive correlations emerged between dependency and positive learning impact ($p=0.492$, $p<0.001$), frequency of use and impact ($p=0.401$, $p<0.001$), and frequency of use and dependency ($p=0.249$, $p=0.013$). The findings highlight exceptionally high GenAI adoption among first-year students alongside predominantly positive perceptions tempered by dependency risks.

Institutions should implement AI literacy training and evidence-based guidelines to maximise benefits while safeguarding critical thinking and academic integrity. This study offers timely insights for responsible GenAI integration in undergraduate education.

INTRODUCTION

The rapid proliferation of generative artificial intelligence (GenAI) tools, particularly large language models such as ChatGPT, has fundamentally reshaped higher education landscapes worldwide (Ravšelj et al., 2025). Launched in late 2022, ChatGPT and similar platforms have achieved unprecedented adoption rates, enabling students to generate text, solve

problems, summarise content, and receive instant explanations with remarkable efficiency (Ganjavi et al., 2024). This technological surge has prompted educators, policymakers, and researchers to examine how these tools influence student learning behaviours, academic performance, and cognitive development (Chan & Hu, 2023). While GenAI promises personalised learning pathways and time savings, it

simultaneously raises profound concerns about over-dependence, erosion of critical thinking, and ethical dilemmas surrounding academic integrity (Almassaad et al., 2024; Abbas et al., 2024). Empirical evidence from diverse global contexts consistently documents high awareness and utilisation of GenAI among university students. In a large-scale survey of U.S. medical students, 96% had heard of ChatGPT and 52% had already incorporated it into coursework, primarily for explaining medical concepts and assisting with diagnosis or treatment plans (Ganjavi et al., 2024). Similarly, in Hong Kong, undergraduate and postgraduate students expressed generally positive attitudes towards GenAI, recognising its potential for personalised support, brainstorming, and research assistance, yet voicing worries about accuracy, privacy, and personal development (Chan & Hu, 2023). Parallel findings emerge from Saudi Arabia, where 78.7% of higher education students reported frequent GenAI use, with ChatGPT dominating at 86.2% and serving functions such as concept clarification, translation, and idea generation (Almassaad et al., 2024). In China's top-tier universities, students perceived AI as useful and easy to use but expressed reservations regarding content accuracy and over-reliance (Yan et al., 2025). Comparable patterns of moderate-to-high adoption and mixed perceptions appear in Romania (Vieriu & Petrea, 2025), Palestine (Daher & Hussein, 2024), the United Kingdom (Johnston et al., 2024; Arowosegbe et al., 2024), Kosovo (Çerkini et al., 2025), Spain (Campillo-Ferrer et al., 2025), and multi-country samples (Heil et al., 2025; Ravšelj et al., 2025). The documented benefits of GenAI centre on efficiency and enhanced comprehension. Students across studies report that these tools save time on academic tasks, facilitate understanding of complex topics, and provide immediate feedback—advantages repeatedly highlighted in Hong Kong (Chan & Hu, 2023), Saudi Arabia (Almassaad et al., 2024), and China (Yan et al., 2025). GenAI also supports brainstorming, summarising literature, grammar

correction, and personalised learning pathways, thereby increasing motivation and engagement (Campillo-Ferrer et al., 2025; Saleh & ElSayary, 2026). In contexts of learning difficulties, GenAI has shown promise in boosting communication skills, time efficiency, and learner confidence (Saleh & ElSayary, 2026). Institutional support further amplifies positive perceptions, as demonstrated through structural equation modelling linking perceived organisational backing to favourable AI attitudes (Jeilani & Abubakar, 2025). Nevertheless, significant challenges temper these benefits. Concerns about dependency, reduced independent thinking, plagiarism, privacy breaches, and diminished critical thinking recur across the literature (Ganjavi et al., 2024; Vieriu & Petrea, 2025; Abbas et al., 2024). In the United Kingdom, students voiced concerns regarding the complete replacement of essays by GenAI, advocating for the establishment of comprehensive university policies (Johnston et al., 2024). Chinese students, in contrast, observed a disparity between their initial enthusiasm and their actual level of proficiency (Yan et al., 2025). Romanian participants, however, highlighted the potential dangers of excessive reliance on GenAI and the associated risks of academic dishonesty (Vieriu & Petrea, 2025). Consequently, longitudinal studies demonstrate a correlation between heightened GenAI usage, frequently driven by academic pressures and time limitations, and an increase in procrastination, memory deficits, and reduced academic performance (Abbas et al., 2024). These findings underscore the dual nature of GenAI; while it can improve immediate productivity, its unmonitored application might impede sustained cognitive growth and the fostering of autonomous learning (Daher & Hussein, 2024; Heil et al., 2025).

Moreover, demographic and contextual factors significantly influence these perceptions. Gender differences appear in some studies, with males sometimes reporting higher efficiency and intention scores (Daher & Hussein, 2024),

whereas year of study and AI knowledge consistently influence interaction quality and overall attitudes (Heil et al., 2025; Çerkim et al., 2025). First-year undergraduates, who constitute a large proportion of many samples, often exhibit cautious yet optimistic engagement, highlighting the need for early intervention through AI literacy programmes (Johnston et al., 2024; Ravšelj et al., 2025). Cross-national comparisons reveal that institutional policies and cultural contexts moderate acceptance: supportive environments in Kosovo and Somalia strengthen positive views (Çerkim et al., 2025; Jeilani & Abubakar, 2025), while ambiguity in policy frameworks heightens concerns in the UK and Spain (Arowosegbe et al., 2024; Campillo-Ferrer et al., 2025). Despite this growing body of evidence, several gaps persist. Prior investigations have predominantly centered on medical or discipline-specific groups (Ganjavi et al., 2024), samples restricted to a single nation (Chan & Hu, 2023; Yan et al., 2025), or general awareness indicators, rather than detailed dependency scores and statistical correlations between usage frequency, dependency, and learning outcomes (Ravšelj et al., 2025). The application of validated multi-item scales to measure dependency, alongside Likert-based impact evaluations or the examination of Spearman correlations between these constructs within general undergraduate populations, especially during the initial years of study, has been limited (Heil et al., 2025). Furthermore, the translation of high adoption rates among first-year students into quantifiable positive or negative learning effects within resource-limited or developing educational settings has received scant attention. This study aims to address these shortcomings by systematically investigating how undergraduate students depend on AI and how that affects their learning.

It contributes to the literature by providing empirical data on tool usage patterns, dependency levels, perceptual evaluations, and statistical associations in a sample characterised by high first-year representation. Such insights are vital

for crafting evidence-based institutional policies, designing AI literacy curricula, and ensuring equitable, responsible integration of GenAI that maximises benefits while mitigating risks.

Aim

To assess dependency on artificial intelligence and its impact on learning among students.

Objectives

- To identify the use of artificial intelligence tools among students for academic purposes.
- To assess the dependency of students on artificial intelligence in learning activities.
- To evaluate the positive and negative impact of artificial intelligence on student learning.
- To assess students' perceptions regarding the role of artificial intelligence in education.
- To examine the relationship between AI usage and learning outcomes among students.

Methodology

This study employed a quantitative, descriptive cross-sectional survey design to assess students' dependency on artificial intelligence (AI) and its impact on learning. The research was conducted among undergraduate students at S.G.T. University, Gurugram, India. A self-structured online questionnaire was developed and administered via Google Forms. The instrument comprised 15 items organised into four sections: (1) demographic characteristics (age, gender, year of study), (2) patterns of AI tool usage (usage status, most frequently used tool, frequency of use, and primary academic purpose), (3) five 5-point Likert-scale statements measuring dependency and perceived impact on learning (1 = Strongly Disagree to 5 = Strongly Agree), and (4) overall opinion regarding the role of AI in education (single-choice categorical

item). The questionnaire was pilot-tested for clarity and face validity before full deployment. Non-probability convenience sampling was used. The survey link was distributed through university student groups, class representatives, and social media platforms between [insert exact dates if available]. Data collection occurred over a two-week period. Participation was entirely voluntary. At the beginning of the form, participants were provided with a detailed information sheet and were required to provide informed consent before proceeding. Confidentiality and anonymity of responses were assured, and no personally identifiable information was collected. A total of 99 responses were received. After rigorous data cleaning—which involved removal of one duplicate record—the final analytic sample comprised 98 valid, consenting responses ($n = 98$). Data were exported to Microsoft Excel for initial cleaning and coding. Descriptive statistics (frequencies, percentages, means, and standard deviations) were computed to summarise demographic profiles, AI usage patterns, Likert-scale responses, and overall opinions. Internal

consistency of the five-item Likert scale was assessed using Cronbach's alpha. The relationship between frequency of AI use, dependency scores, and perceived positive learning impact was examined using Spearman rank-order correlation coefficients. All statistical analyses were performed using Microsoft Excel and JMOVI. A significance level of $p < 0.05$ was considered statistically significant.

Results

A total of 99 responses were received through the online survey platform. After excluding one duplicate entry, the final analytic sample consisted of 98 participants who provided valid, consenting responses ($N = 98$).

a) Participant Characteristics

The sample was predominantly young and early in their academic career. Most participants were aged 18–20 years (61.2%), female (60.2%), and in their first year of study (81.6%). Table 1 presents the complete demographic profile.

Table 1. Demographic characteristics of participants ($N = 98$)

Characteristic	Category	n	%
Age group	18–20	60	61.2
	20–22	31	31.6
	22–24	6	6.1
	24–26	1	1.0
Gender	Female	59	60.2
	Male	39	39.8
Year of study	1st year	80	81.6
	2nd year	15	15.3
	3rd year	3	3.1

b) Use of Artificial Intelligence Tools in Academic Work

The vast majority of participants (93/98; 94.9%) reported using AI tools to support their academic work. ChatGPT was by far the most commonly used tool (73.5%), followed distantly by Google Gemini (21.4%). Almost half the sample reported using AI tools “sometimes” (49.0%), while about one-quarter used them “often” (24.5%).

for using AI was understanding difficult concepts (56.3% of those who specified a main purpose, $n = 54/96$). Other purposes included exam preparation (13.5%), problem solving (10.4%), and summarizing notes (8.3%). Detailed usage patterns are shown in Table 2.

The most frequently endorsed primary purpose

Table 2. Patterns of AI tool usage for academic purposes (N = 98)

Item	Category	n	%
Use AI tools for academics?	Yes	93	94.9
	No	5	5.1
Most frequently used AI tool	ChatGPT	72	73.5
	Google Gemini	21	21.4
	Other	5	5.1
Frequency of use	Sometimes	48	49.0
	Often	24	24.5
	Rarely	16	16.3
	Very often	7	7.1
	Never	3	3.1
Main purpose*	Understanding difficult concepts	54	56.3
	Exam preparation	13	13.5
	Solving problems	10	10.4
	Summarizing notes	8	8.3

	Writing assignments	5	5.2
	Generating ideas	4	4.2
	Translation / paraphrasing	2	2.1

- n = 96 (two participants did not indicate a main purpose)

c) Perceptions of AI: Likert Items

Participants rated five statements on a 5-point Likert scale (1 = Strongly disagree to 5 = Strongly agree). The highest agreement was observed for the time-saving benefit of AI (M = 3.67, SD = 1.24), followed closely by its usefulness in understanding difficult topics (M = 3.62, SD =

1.26). Regular reliance on AI received the lowest mean score (M = 3.08, SD = 1.18). Participants expressed moderate concern that excessive AI use could reduce independent thinking (M = 3.48, SD = 1.22). Overall, they tended to view AI's impact on their own learning as positive (M = 3.41, SD = 1.11).

Table 3. Descriptive statistics for Likert-scale items (N = 98)

Statement	Mean	SD	Agree* %	Neutral %	Disagree* %
AI helps me understand difficult topics more easily	3.62	1.26	61.2	19.4	19.4
AI saves time in completing my academic tasks	3.67	1.24	59.2	24.5	16.3
I rely on AI tools regularly for my studies	3.08	1.18	32.7	40.8	26.5
Excessive use of AI may reduce independent thinking among students	3.48	1.22	43.9	36.7	19.4
AI has a positive overall impact on my learning	3.41	1.11	43.9	40.8	15.3

- Agree = Agree + Strongly agree; Disagree = Disagree + Strongly disagree

(Figure 8 – Mean Likert scores with 95% confidence intervals)

More than half of participants (55.1%) endorsed the view that “AI should be used as a supportive learning tool.” About one-quarter (26.5%) preferred more restricted use (“only in limited situations”), while only 9.2% believed AI should be avoided in academics altogether.

d) General Attitude Toward AI in Education

Table 4. Overall opinion regarding the role of AI in education (N = 98)

Statement	n	%
Should be used as a supportive learning tool	54	55.1
Should be used only in limited situations	26	26.5
Should be avoided in academics	9	9.2
Can replace many traditional learning methods	5	5.1
Not sure	4	4.1

e) Reliability and Associations

The five-item Likert scale showed good internal consistency (Cronbach's $\alpha = 0.821$). Spearman rank correlations indicated statistically significant positive relationships between:

- frequency of AI use and perceived positive learning impact ($\rho = 0.401$, $p < 0.001$)
- frequency of AI use and self-reported dependency ($\rho = 0.249$, $p = 0.013$)
- dependency score and perceived positive learning impact — the strongest association observed ($\rho = 0.492$, $p < 0.001$)

Table 5. Spearman correlations and scale reliability

Analysis	ρ	p-value
Frequency of use $\leftrightarrow$ Positive learning impact	0.401	< 0.001
Frequency of use $\leftrightarrow$ Dependency	0.249	0.013
Dependency $\leftrightarrow$ Positive learning impact	0.492	< 0.001
Cronbach's α (5-item scale)	0.821	—

Overall, the findings reveal widespread adoption of generative AI tools — especially ChatGPT — among first-year undergraduate students, primarily to aid conceptual understanding. While most participants perceived tangible benefits (time-saving, easier comprehension), they expressed moderate concern about potential negative effects on independent thinking. Notably, higher self-reported dependency on AI

was strongly associated with more favorable perceptions of its overall impact on learning.

Discussion

The present study demonstrates exceptionally high adoption of generative AI among undergraduate students, with 94.9% reporting use—predominantly ChatGPT—for understanding difficult concepts. The adoption rate is higher than what's been found in many

international studies, including a 52% usage rate in the United States medical students (Ganjavi et al., 2024) and a 78.7% frequent use rate in Saudi Arabia (Almassaad et al., 2024). The preference for ChatGPT (73.5%) and conceptual clarification (56.3%) closely mirrors global trends, such as the explanation of medical concepts (Ganjavi et al., 2024) and idea generation/summarizing in Hong Kong (Chan & Hu, 2023) and Saudi Arabia (Almassaad et al., 2024). Students' "sometimes" frequency (49.0%) suggests a cautious approach to integration rather than consistent dependence, which is consistent with moderate usage reported in UK (Johnston et al., 2024) and Palestinian higher education samples (Daher & Hussein, 2024). Perceptions were largely positive, with the highest agreement levels for time-saving ($M = 3.67$) and conceptual understanding ($M = 3.62$), reflecting the benefits emphasized in various studies: efficiency, personalized support, and increased productivity (Yan et al., 2025; Vieriu & Petrea, 2025; Campillo-Ferrer et al., 2025).

The overall positive impact ($M = 3.41$) and the majority endorsement of AI as a "supportive learning tool" (55.1%) reflect optimistic perspectives observed in various contexts (Chan & Hu, 2023; Saleh & ElSayary, 2026). Conversely, moderate concerns regarding diminished independent thought ($M = 3.48$) and reduced reliance scores ($M = 3.08$) align with prevalent anxieties about excessive dependence, the erosion of critical thinking skills, and a decline in autonomy, as documented in Chinese (Yan et al., 2025), Romanian (Vieriu & Petrea, 2025), and international studies (Ravšelj et al., 2025). A significant finding is the robust positive correlation between dependency and perceived learning impact ($\rho = 0.492$, $p < 0.001$), as well as the associations between frequency and impact ($\rho = 0.401$) and frequency and dependency ($\rho = 0.249$).

This observation implies that increased interaction cultivates positive perceptions, potentially establishing a self-reinforcing cycle,

which is consistent with the positive associations observed between usage and attitudes in Kosovo (Çerkini et al., 2025) and the effects of institutional support (Jeilani & Abubakar, 2025). Conversely, it also indicates potential hazards, aligning with research that connects ChatGPT usage to procrastination and diminished performance under stress (Abbas et al., 2024). The strong scale reliability ($\alpha = 0.821$) further supports these interpretations. These results highlight the necessity for structured institutional policies and AI literacy training, as has been recommended globally (Ganjavi et al., 2024; Johnston et al., 2024; Arowosegbe et al., 2024). In settings such as first-year undergraduates (81.6% first-year), targeted guidance could help to reduce dependency risks while maximizing the advantages.

Limitations encompass the study's reliance on a predominantly young, female, first-year cohort from a single institution, thereby restricting the scope of generalizability, alongside the inherent constraints of self-reported data. The research ultimately substantiates the notion that students perceive generative AI as a valuable yet multifaceted instrument. By proactively addressing apprehensions through the implementation of explicit guidelines and the cultivation of relevant competencies (Heil et al., 2025), educators can responsibly leverage its capabilities, thereby aligning with the prevailing emphasis on balanced and ethical integration within the global higher education discourse.

Conclusion

This investigation demonstrates a remarkably high rate of generative AI adoption among undergraduate students, with 94.9% actively utilizing these tools—predominantly ChatGPT—for academic endeavors, most frequently to facilitate comprehension of challenging concepts. Students expressed predominantly positive perceptions, particularly concerning the time-saving advantages and the enhancement of conceptual understanding, while the majority (55.1%) viewed AI as a supplementary learning

resource rather than a substitute for conventional pedagogical approaches. Conversely, reservations regarding excessive dependence and a decline in autonomous thought processes remain, and the robust association between reliance and the perception of positive learning outcomes ($\rho = 0.492$, $p < 0.001$) highlights both the benefits and the possible drawbacks of heightened interaction. These results corroborate and build upon the expanding global scholarship concerning GenAI in higher education, validating that students perceive these technologies as beneficial, albeit with inherent complexities. The notably elevated utilization rate within this initial-year group emphasizes the imperative for preemptive institutional measures. Clear, evidence-based policies, comprehensive AI literacy training, and structured guidelines are essential to maximise benefits while safeguarding critical thinking, academic integrity, and equitable access. Although limited to a single institution and a predominantly first-year sample, the results provide timely insights for educators and policymakers navigating the rapid integration of generative AI. Future studies should use longitudinal research methods, include a variety of institutions and academic fields, and examine the lasting effects of generative AI on educational results, cognitive development, and fair access.

In summation, generative AI has transitioned from an emerging technology to a pivotal element in student education. By establishing a responsible framework that includes well-informed policies, targeted training programs, and ethical guidelines, universities can harness its transformative potential while also upholding the core principles of independent academic work and deep learning. The optimal trajectory necessitates not restriction, but rather, a judicious, student-focused integration strategy.

Reference

1. Chan, C.K.Y. (2023). *Students' voices on generative AI: perceptions, benefits, and challenges in higher education*.

- International Journal of Educational Technology in Higher Education. DOI: 10.1186/s41239-023-00411-8
2. Johnston, H. et al. (2024). *Student perspectives on the use of generative artificial intelligence technologies in higher education*. International Journal for Educational Integrity. DOI: 10.1007/s40979-024-00149-4
3. Abbas, M., Jam, F.A., & Khan, T.I. (2024). *Is it harmful or helpful? Examining the causes and consequences of generative AI usage among university students*. International Journal of Educational Technology in Higher Education. DOI: 10.1186/s41239-024-00444-7
4. Almassaad, A. et al. (2024). *Student Perceptions of Generative Artificial Intelligence: Investigating Utilization, Benefits, and Challenges in Higher Education*. Systems. DOI: 10.3390/systems12100385
5. Daher, W. et al. (2024). *Higher Education Students' Perceptions of GenAI Tools for Learning*. Information. DOI: 10.3390/info15070416
6. Arowosegbe, A. et al. (2024). *Perception of generative AI use in UK higher education*. Frontiers in Education. DOI: 10.3389/feduc.2024.1463208
7. Ravšelj, D. et al. (2025). *Higher education students' perceptions of ChatGPT: A global study of early reactions*. PLOS ONE. DOI: 10.1371/journal.pone.0315011
8. Vieriu, A.M. et al. (2025). *The Impact of Artificial Intelligence (AI) on Students' Academic Development*. Education Sciences. DOI: 10.3390/educsci15030343
9. Jeilani, A. et al. (2025). *Perceived institutional support and its effects on student perceptions of AI learning in higher education: the role of mediating perceived learning outcomes and*

- moderating technology self-efficacy.*
Frontiers in Education.
DOI: 10.3389/feduc.2025.1548900
10. Campillo-Ferrer, J.M. et al. (2025). *Student Perceptions of the Use of Gen-AI in a Higher Education Program in Spain.* Digital.
DOI: 10.3390/digital5030029
 11. Yan, Y. et al. (2025). *Perceptions of AI in Higher Education: Insights from Students at a Top-Tier Chinese University.* Education Sciences.
DOI: 10.3390/educsci15060735
 12. Heil, J. et al. (2025). *Students' perceived impact of GenAI tools on learning and assessment in higher education: the role of individual AI competence.* Smart Learning Environments.
DOI: 10.1186/s40561-025-00395-0
 13. Saleh, D. et al. (2025). *Generative AI use and self-learning in higher education: the role of learning difficulties.* Frontiers in Education.
DOI: 10.3389/feduc.2025.1737928
 14. Çerkini, B. et al. (2025). *Artificial intelligence in higher education: student perceptions, challenges, and institutional policies in learning practices.* Frontiers in Education.
DOI: 10.3389/feduc.2025.1700056
 15. Ganjavi, C. et al. (2024). *ChatGPT and large language models (LLMs) awareness and use: A prospective cross-sectional survey of U.S. medical students.* PLOS Digital Health.
DOI: 10.1371/journal.pdig.0000596