

# **A Study on Impact of Artificial Intelligence Tools on Academic Performance of College Students**

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## **Abstract**

Artificial Intelligence technologies have been rapidly developing and transforming the field of higher education in many ways, including the manner in which students learn and perform academically. Such Artificial Intelligence technologies as intelligent tutoring systems, generative AI applications, and adaptive learning apps are used by college students more and more frequently when it comes to obtaining help in studies, generating content, and receiving personalized support. In turn, the present study analyzes how Artificial Intelligence tools influence the academic performance, learning behavior, and thinking of college students with regard to three main hypotheses.

Specifically, the study focuses on the possibility that AI tools affect students' academic performance in some ways, change their learning behavior, as well as promote dependency or alterations in independent thinking. Through analyzing the existing empirical literature and identifying academic trends regarding AI tools in higher education, the study considers both the advantages and disadvantages of the discussed topic. From the discussion, one may conclude that AI technologies considerably contribute to the increase in the academic success of students.

Furthermore, the results of the study indicate that students who make use of AI tools show high levels of engagement and time management skills and experience increased academic success. What is more important, AI technologies considerably change the learning behavior of learners, including new learning practices, the ways of searching for information, and new problem-solving approaches. However, at the same time, certain problems should be addressed. Specifically, over-reliance on AI technologies may lead to increased dependence on technology and decreased cognitive abilities, including critical thinking and creativity. Thus, ethical guidelines and the appropriate integration of AI tools are required.

**Keywords:** Artificial Intelligence Tools, Academic Performance; Learning Behavior, College Students

## **1.Introduction**

The rapid evolution of artificial intelligence technologies has brought substantial transformation to the sphere of higher education. The application of AI-based tutoring tools, learning management systems, automatic evaluation tools, and generative AI platforms has grown exponentially in recent years. College students leverage these tools extensively within their educational practice as academic sources that assist in developing content, providing explanations, offering personalized learning, and saving time. Therefore, artificial intelligence may be considered a powerful instrument for implementing technology-enabled learning and has a significant effect on the process of acquiring and processing academic materials.

There are several prominent advantages that AI may offer to the field of academia. Specifically, personalized learning, instant feedback mechanisms, adaptive content distribution, and data-based learning support are beneficial for college students. Earlier research indicated that the application of artificial intelligence in higher education has a positive effect on academic performance. Nonetheless, AI should be applied judiciously within the context of academic practice.

However, one should bear in mind that despite having some definite advantages, the use of AI tools may also raise a number of doubts as to possible adverse consequences. According to many of the critics, the frequent application of AI tools may lead to a loss of the capacity to reason critically, think creatively and independently. Also, issues related to academic integrity, ethical application of AI tools, the danger of hacking the data and excessive reliance on AI create many troubles for colleges and universities.

Taking into account the mentioned above facts, it seems reasonable to examine the overall influence of AI tools on college students to identify possible opportunities and challenges caused by this kind of technology. This research aims at discovering the impact of Artificial Intelligence tools on the academic performance and the learning process of college students. Hypotheses will help identify the level of influence of AI tools on studying and reveal whether any addiction to the application of AI is possible.

## **2. Review of Literature**

Integration of AI technologies into higher education has had significant impacts on students' academic performances and behaviors. According to research carried out by (Vieriu & Petrea, 2025), AI technologies improve learning process because they provide students with personalized learning experience that positively impacts students' engagement and performance.

According to an article written by (Younas et al., n.d.), the use of AI technologies such as GPT technologies and intelligent learning systems increases innovation in academic performance as they promote personalized learning.

Research carried out by (Singh et al., 2026) demonstrates that the use of AI technologies is associated with higher student autonomy, motivation, and self-efficacy due to their flexibility and interactivity. Additionally, research conducted by (Hanshaw et al., 2025) demonstrates that interaction with AI assistants results in better academic performance.

Also according to research (Guidoum & Elkhansa, 2024), educators see AI technology as an aid that develops the capacity for critical thinking, creativity, and self-directed learning of students. In addition, research conducted on the effect of AI technologies, like ChatGPT and Grammarly, found that there was an increase in academic performance and motivation among college students(Micabalo et al., 2024).

Nevertheless, there are also negative implications associated with the use of AI according to several studies. The studies indicated that overuse of AI technology could diminish the skills related to critical thinking, motivation, and self-directed learning(Mijares et al., n.d.). Also, (Dogaru et al., 2025) indicated that while AI has helped improve motivation and competence, there were risks of dependency and compromised academic honesty due to its abuse.

Experimental studies also indicated that the use of AI without any control may lead to disengagement and decreased conceptual understanding. Other issues associated with the use of AI include lack of student teacher interactions, ethical issues, and issues related to originality.(Vilcarino & Langreo, 2025)

In conclusion, the findings of the research show that there is a duality of views on the issue under study, as the positive effects of artificial intelligence technologies on students' success and performance are combined with threats to the formation of cognitive abilities and moral values of learners.

### **3.Research Gap**

In previous literature, the influence of Artificial Intelligence on academic achievement, learning behavior, or dependence is considered separately, but not together. Moreover, most papers analyze the perception of these tools as well as their use, but not their general influence on academic results and the ability to think independently. Besides, the findings vary because of the different context of implementation and patterns of using AI tools. Furthermore, there is no empirical evidence from developing nations like India. Therefore, further research is required to explore the joint influence of AI tools.

### **4.Research Objectives**

1. To study the usage of AI tools among college students.
2. To analyze the impact of AI tools on academic performance.
3. To examine the influence of AI tools on students' learning behavior.
4. To identify the benefits and challenges associated with AI usage in education.

### **5.Hypotheses**

1.  $H_{0\ 1}$  : Artificial Intelligence tools have no significant impact on the academic performance of college students.  
 $H_{1\ 1}$  : Artificial Intelligence tools have a significant impact on the academic performance of college students.
2.  $H_{0\ 2}$  : Artificial Intelligence tools do not significantly influence the learning behavior of college students.  
 $H_{1\ 2}$  : Artificial Intelligence tools significantly influence the learning behavior of college students.
3.  $H_{0\ 3}$  : The use of Artificial Intelligence tools does not lead to dependency or changes in independent thinking among college students.  
 $H_{1\ 3}$  : The use of Artificial Intelligence tools leads to dependency and affects independent thinking among college students.

### **6.Research Methodology**

- Descriptive and Analytical research designs will be adopted in the investigation of the effects of AI tool use on the performance of and learning behaviors of the participants.
- The research is empirical, being conducted on primary data from the respondents.

- Primary data collection was conducted using a structured questionnaire, while secondary data was collected from scholarly papers and online academic resources.
- Structured questionnaire Google form containing Likert scale questions.
- Convenience sampling method was used for selecting the sample population.
- There were 54 college students used as the respondents in the research.
- The data collected will be analyzed through the use of Frequency Distribution and Percentage analysis of results.
- Chi-Square Test ( $X^2$ ) via SPSS method. Level of significance will be 5% ( $\alpha = 0.05$ ).

## 7.Data Analysis and Interpretation

### Hypothesis 1: Academic Performance

1.  $H_{01}$  : Artificial Intelligence tools have no significant impact on the academic performance of college students.

$H_{11}$  : Artificial Intelligence tools have a significant impact on the academic performance of college students.

### Case Processing Summary

| Cases   | N  | Percent |
|---------|----|---------|
| Valid   | 54 | 100%    |
| Missing | 0  | 0%      |
| Total   | 54 | 100%    |

### Chi-Square Tests

| Test               | Value | df | Asymp. Sig. (2-sided) |
|--------------------|-------|----|-----------------------|
| Pearson Chi-Square | 27.63 | 3  | 0.000                 |

### Interpretation

According to the SPSS output, the value of p-value (0.000) is less than 0.05, which means that the null hypothesis can be rejected. It can be concluded that AI tools influence academic performance significantly. It was found that most respondents stated that AI makes learning

more comprehensible and productive, and positively influences the overall academic performance.

### **Hypothesis 2:**

**H<sub>0 2</sub>** : Artificial Intelligence tools do not significantly influence the learning behavior of college students.

**H<sub>1 2</sub>** : Artificial Intelligence tools significantly influence the learning behavior of college students.

### **Case Processing Summary**

| Cases   | N  | Percent |
|---------|----|---------|
| Valid   | 54 | 100%    |
| Missing | 0  | 0%      |
| Total   | 54 | 100%    |

### **Chi-Square Tests**

| Test               | Value | df | Asymp. Sig. (2-sided) |
|--------------------|-------|----|-----------------------|
| Pearson Chi-Square | 25.10 | 3  | 0.000                 |

### **Interpretation**

The value of p-value, according to the SPSS analysis, is equal to 0.000 and, thus, is less than 0.05. This means that the null hypothesis can be rejected and it is clear that there is a strong influence of AI tools on learning behavior of students. The results indicate that AI promotes engagement in learning activities and self-learning.

### **Hypothesis 3**

**H<sub>0 3</sub>** : The use of Artificial Intelligence tools does not lead to dependency or changes in independent thinking among college students.

**H<sub>1 3</sub>** : The use of Artificial Intelligence tools leads to dependency and affects independent thinking among college students.

### **Case Processing Summary**

| Cases        | N         | Percent     |
|--------------|-----------|-------------|
| Valid        | 54        | 100%        |
| Missing      | 0         | 0%          |
| <b>Total</b> | <b>54</b> | <b>100%</b> |

### Chi-Square Tests

| Test               | Value | df | Asymp. Sig. (2-sided) |
|--------------------|-------|----|-----------------------|
| Pearson Chi-Square | 4.38  | 3  | 0.223                 |

### Interpretation

As per the SPSS output, the value of p-value (0.223) is greater than 0.05, which means that the null hypothesis cannot be rejected. This signifies that there is no impact of AI on independent thinking among students. Even though some students may depend on AI tools, there is not enough evidence in terms of statistics.

### 8. Findings:

The results of the research showed that AI tools have a considerable effect on academic performance among college students. The results of the Chi-square test proved the existence of a statistically significant relationship between the use of AI and academic performance. Most respondents stated that AI tools helped them comprehend the subject better, become more productive and successful in their education.

Moreover, the research proved that AI tools have a significant effect on students' behavior during the process of learning. Statistics showed that AI helps students engage, gain interest in studies and become better self-learners. With AI tools, students were more inclined to apply innovative techniques to learn something.

In addition, the results of this study revealed that the connection between AI use and students' dependence and independent thinking does not exist statistically. Even though some students depend on AI tools, this dependence did not lead to the development of independent thinking among respondents.

In summary, the research shows that AI technology serves as an efficient educational tool by positively affecting performance and learning behavior of learners and does not impair their independence of thinking.

## 9. Conclusion

In conclusion, the research demonstrates that AI tools have a substantial positive effect on the performance of students at colleges. These tools are helpful in improving comprehension, increasing productivity, and promoting learning outcomes. Moreover, it is evident from the results that the influence of AI is crucial in terms of affecting the learning process of students, including the increase in engagement and interest in studying, as well as self-study skills. Thus, AI tools make it easier for students to use flexible approaches in the learning process. At the same time, the study indicates that there is no substantial effect of AI on dependency and independent thinking. While some students might use AI tools frequently, it does not mean that their independence is affected substantially. Hence, AI can be considered an efficient educational tool.

## Bibliography

1. Dhulipala, M., & Bhujade, A. (2025). Analyzing the Impact of AI on Exam Preparation and Student Performance in Higher Education. *Journal of Informatics Education and Research*, 5(2). <https://doi.org/10.52783/jier.v5i2.2924>
2. Dogaru, M., Pisićă, O., Popa, C.-Ștefan, Răgman, A.-A., & Tololoi, I.-R. (2025). The perceived impact of artificial intelligence on academic learning. *Frontiers in Artificial Intelligence*, 8, 1611183. <https://doi.org/10.3389/frai.2025.1611183>
3. Guidoum, S., & Elkhansa, S. (2024). The Impact of Artificial Intelligence on Students' Academic Performance from University Teachers' Perspectives. *ATRAS Journal*, 5, 381–395. <https://doi.org/10.70091/atras/AI.24>
4. Hanshaw, G., Wicker, E., & Denlinger, K. (2025). An Experimental Study of the Effect of AI Course Assistants on Student Grade Outcomes | Open Praxis. <https://doi.org/10.55982/openpraxis.17.2.772>
5. Klimova, B., & Pikhart, M. (2025). Exploring the effects of artificial intelligence on student and academic well-being in higher education: A mini-review. *Frontiers in Psychology*, 16, 1498132. <https://doi.org/10.3389/fpsyg.2025.1498132>
6. Maamor, H., Achim, N., Ahmad, N., Roszaman, N., Anuar, N., Azwa, N., Rahman, S., & Hamjah, N. (2024). The Effect of Artificial Intelligence (AI) on Students' Learning.

Information Management and Business Review, 16, 856–867.  
[https://doi.org/10.22610/imbr.v16i3S\(I\)a.4178](https://doi.org/10.22610/imbr.v16i3S(I)a.4178)

7. Micabalo, A., Ofianga, A., Ormita, E., Orola, G., Ong, J. D., & Fuentes, J. (2024). THE IMPACT OF AI-POWERED STUDY TOOLS ON THE ACADEMIC PERFORMANCE AND THE MOTIVATION OF HIGHER EDUCATION STUDENTS Submitted by.
8. Mijares, K. A., Gutierrez, J. A. F., Mabutol, C. J. H., & Bolisay, D. A. (n.d.). AI's Impact on Grade 10 Academic Performance | PDF | Artificial Intelligence | Intelligence (AI) & Semantics. Scribd. Retrieved April 19, 2026, from <https://www.scribd.com/document/888074805/The-Impact-of-Artificial-Intelligence-on-the-Academic-Performance-of-Selected-Grade-10-Students>
9. Singh, A., Singh, H. P., & Alam, Md. F. (2026). The impact of AI tools enabled student engagement on academic performance, employability, and empowerment in Ha'il Region, Saudi Arabia. *Acta Psychologica*, 262, 106103. <https://doi.org/10.1016/j.actpsy.2025.106103>
10. Vieriu, A. M., & Petrea, G. (2025). The Impact of Artificial Intelligence (AI) on Students' Academic Development. *Education Sciences*, 15(3), 343. <https://doi.org/10.3390/educsci15030343>
11. Vilcarino, J., & Langreo, L. (2025, October 8). Rising Use of AI in Schools Comes With Big Downsides for Students. [https://www.edweek.org/technology/rising-use-of-ai-in-schools-comes-with-big-downsides-for-students/2025/10?utm\\_source=chatgpt.com](https://www.edweek.org/technology/rising-use-of-ai-in-schools-comes-with-big-downsides-for-students/2025/10?utm_source=chatgpt.com)
12. Ward, B., Bhati, D., Fnu, N., & Guercio, A. (2024, March 12). Analyzing the Impact of AI Tools on Student Study Habits and Academic Performance. [https://arxiv.org/html/2412.02166v1?utm\\_source=chatgpt.com](https://arxiv.org/html/2412.02166v1?utm_source=chatgpt.com)
13. Younas, M., El-Dakhs, D. A. S., & Noor. (n.d.). Frontiers | The impact of artificial intelligence-based learning tools in academic innovation: A review of Deep seek, GPT, and Gemini (2020–2025). Retrieved April 19, 2026, from [https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1689205/full?utm\\_source=chatgpt.com](https://www.frontiersin.org/journals/education/articles/10.3389/feduc.2025.1689205/full?utm_source=chatgpt.com)

