



## A STUDY ON THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING STUDENT ACADEMIC PERFORMANCE

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### Abstract:

Artificial Intelligence (AI) has become a transformative technology in education, offering innovative tools that support learning and academic development. AI-based applications, such as intelligent tutoring systems, virtual assistants, Chatbots, and writing assistance tools, are increasingly being used by students for educational purposes. These technologies have the potential to transform traditional learning methods into engaging sessions by improving understanding, engagement, and overall academic performance. The study aims to evaluate the role of Artificial Intelligence in enhancing student academic performance among undergraduate students. The study helps to analyse how AI tools lead to improved understanding of academic concepts, quality of assignments, time management, and overall learning efficiency. It also helps to know the students' perceptions regarding the opportunities and challenges associated with the use of AI in academics. A descriptive research method is used. Descriptive and analytical methods are used to interpret the collected data. The primary data was collected through a structured questionnaire. Secondary data was sourced from journals, articles and online reports. The findings of the study are expected to indicate that AI plays a significant role in enhancing academic performance and offers various benefits. However, challenges like over-dependency on AI tools, accuracy and reliability issues, data privacy and security risk were also identified. The study highlights the importance of proper guidance and awareness about ethical use of AI tools to maximise learning outcomes while minimising over-dependence. The results of this research may help educational institutions and policymakers in framing effective strategies for the responsible use of the AI in education and enhance academic development.

**Keywords:** Artificial Intelligence tools, Students, Academic development, Education, Over-dependency

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### Introduction:

Artificial Intelligence (AI) means the ability of computer systems to perform tasks that are normally performed by humans, such as learning, reasoning, problem-solving, decision-making, and language understanding

([https://en.wikipedia.org/wiki/Artificial\\_intelligence](https://en.wikipedia.org/wiki/Artificial_intelligence), n.d.). AI systems are designed to analyse data and give recommendations with minimal human intervention. In recent years, rapid advancements in computing power

and data availability have led to the widespread adoption of Artificial Intelligence across various sectors. Artificial intelligence in education has been a powerful tool to enhance the learning processes among students. There is a significant shift from traditional, uniform teaching methods to dynamic, data-driven systems that help an individual learner master the academic content. AI-based applications such as online tutoring systems, Chatbots, and writing assistance tools provide personalised learning experiences to students.

The various AI tools help the students understand the complex contents in a simplified manner that ultimately helps them to improve their academic skills at their own pace. With the increasing integration of digital technologies in overall education, the use of Artificial Intelligence in academic activities has become more important and noteworthy. Students increasingly rely on AI tools for assignment preparation, presentation and exam revision (Tomlinson, 2025). While AI possesses various benefits in enhancing academic performance, it also raises concerns related to ethical use, data privacy, and over-dependence. Thoughtful and genuine use of AI brings an opportunity for students in education to be transformed for a better future. Therefore, understanding the role of Artificial Intelligence in education is essential to ensure its effective and responsible application in academic environments. AI boosts academic performance through personalisation, where algorithms adjust difficulty levels based on real-time proficiency, resulting in higher retention and motivation. The future for AI in education is bright, because technology can personalise and effectively engage the learning experience. As a result, AI has the potential to improve student engagement, learning efficiency, and academic performance.

#### Benefits of AI:

1. Personalised learning: AI provides information based on the students' need and understanding level, which helps to improve the performance
2. Better understanding of Concepts: AI helps to understand the difficult concepts in very easy terms. Helps students to grasp the difficult subject more effectively.
3. Instant feedback and assessment: AI tools provide quick responses to the topics, assignments, quizzes, test that enable them to identify mistakes and improve continuously.

4. Improvement Presentation Skills: Tools like Grammarly help students to improve language, sentence structure and bring clarity in academics.
5. **Time Management and Productivity:** AI helps students save time in research, provides precise notes and tricks for revision, allowing them to focus more on learning and exam preparation.
6. Increased Student Engagement: AI applications make learning more interactive and engaging, which motivates them to grab more knowledge related to their interest.
7. **Support for Slow Learners:** AI tools provide additional learning support to students who require more time and practice, and help build confidence among them.

#### Challenges in AI:

1. **Overdependence:** Excessive reliance on AI tools reduces the creativity, critical thinking and informed decision-making ability among students.
2. **Accuracy:** Many of the times, AI tools give inaccurate and misleading responses, and students have to rely on the information provided.
3. **Ethical concerns:** AI-generated information without proper acknowledgement leads to plagiarism and ethical dishonesty.
4. **Data privacy and Security:** AI tools require personal data for accessing, raising concerns about privacy and data security.
5. **Technical expertise:** Some educators struggle with technical expertise, spending excessive time and effort trying to adapt AI tools.
6. **Digital Divide:** Paid AI tools and a lack of access to technology may create inequality among students from different socio-economic backgrounds.

#### Future Trends in AI and Education:

1. Adaptive learning systems: AI will increasingly offer customised learning paths based on individual student abilities, learning styles, and progress.

2. Augmented reality and virtual reality: AI will work together with Augmented Reality (AR) and Virtual Reality (VR) to make learning more engaging and realistic, where students can interact with virtual environments and learn by experiencing concepts instead of just reading or listening.
3. Natural language processing: Natural Language Processing helps AI understand and respond to human language. Advanced AI-Chatbots and virtual assistants will quickly answer students' questions, clear doubts, and provide instant academic support easily and naturally.
4. Increased Focus on AI Ethics and Governance: Future education systems will emphasise ethical AI use, data privacy, and academic integrity.

#### Objectives of the Study:

1. To study the awareness and usage of AI tools among students
2. To analyse the role of AI tools in improving the student academic performance
3. To examine students perception towards effectiveness of AI in education.
4. To identify how AI help students understanding the concepts and improving the learning outcomes.
5. To evaluate the benefits and challenges faced by the students while using AI Applications.

#### Hypotheses of the Study :

**H<sub>0</sub> (Null Hypothesis):** There is no significant relationship between the Artificial Intelligence tools and student academic performance.

**H<sub>1</sub> (Alternative Hypothesis):** There is a significant relationship between the Artificial Intelligence tools and student academic performance.

**H<sub>0</sub> (Null Hypothesis):** Artificial Intelligence tools does not significantly improve students understanding of academic concepts.

**H<sub>1</sub> (Alternative Hypothesis):** Artificial Intelligence tools significantly improves students understanding of academic concepts.

#### Literature Review:

(2025) Holmes, W., & Tuomi has studied that AI technologies and tools affects the learning process in positive manner. It discusses about the issues faced by the students like accuracy, reliability and over dependence while adapting to AI.

(Vivek, 2025)

(2025) Mishra Vivek has studied that future of AI in education depends upon the fair and ethical use, it can enhance academic performance without compromising educational values. A balanced use of AI will help students perform better and prepare them for a technology-driven world.

#### Research Methodology :

The present study represents the descriptive and analytical research design to examine the role of artificial intelligence in enhancing student academic performance. The descriptive research design helps in understanding the student awareness, usage patterns and reliance on the AI tools used for academic purpose. This study is quantitative in nature, as numerical data is collected through structured questionnaire. The responses are analysed using statistical tools. The random sampling technique has been adopted, where each respondent have equal chance of selection. The target group of the study consist of undergraduate students as they actively use AI tools like Grammarly, Chatbots for their academic activities like assignments, presentation and for exam.

**Respondent:** Data is collected from 87 respondents, which is considered to be adequate.

#### Data Collection Method:

**Primary Data:** It was collected through structured questionnaire designed using Google form to understand the role of AI in developing the overall academic performances.

**Secondary Data:** Journals, websites, books and research articles used to support the study.

### Data Analysis and Interpretation:

Are you aware of Artificial Intelligence (AI) tools used in education?

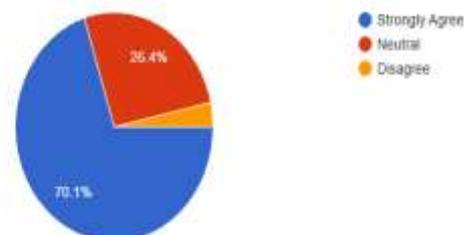
87 responses



The above chart represent the level of awareness of AI tools used in education among the students. Out of 87 respondents, 97.7% students are aware of AI tools used. Whereas 2.3% are not aware. The results clearly indicate that AI has become widely recognised and integrated into educational environment. High awareness also provides a strong base for the effective adoption of AI tools in enhancing academic performance.

Use of AI tools has improved the quality of my assignments and projects and help me to save time in academic tasks.

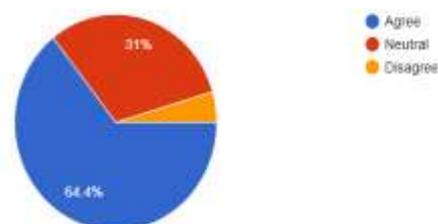
87 responses



The chart shows the student opinions on the use of AI tools has improved the quality of their assignments and projects and help them to save time in academic tasks. Out of 87 respondents, 70.1% strongly agree. About **26.4%** of respondents expressed a **neutral** opinion, indicating moderate or situational benefits of AI usage.

Heavy dependence on AI tools reduced students critical thinking, creativity, and independent problem-solving skills.

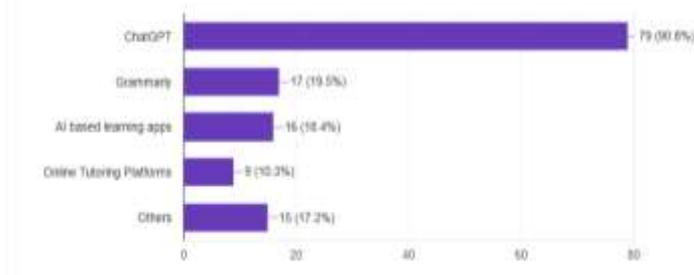
87 responses



The chart represents the heavy dependence on AI tools reduced students critical thinking, creativity and independent problem solving skills. Out of 87 respondents, a majority (64.4%) agree that excessive use reduces the ability to think creatively and negatively affects the cognitive skills. **31%** of respondents expressed a **neutral** opinion. Only a **small percentage** of respondents **disagree**, suggesting that very few students believe AI does not affect their thinking abilities. This indicates the need for **balanced and responsible use of AI**.

Which AI tools do you use for academic purposes?

87 responses



The above chart represents the AI tools used by the students for academic purposes. Out of 87 respondents, majority of respondents (90.8%) commonly use ChatGPT for Academics. This is followed by Grammarly (19.5%), which improves the language quality and accuracy. 16 Respondents (18.4%) use other AI based learning apps. Where 10.3% rely on Online Tutoring Platforms.

**Findings :**

That majority of students are aware of AI tools used in education. Most commonly used AI tools are ChatGpt, followed by Grammarly and other online tutoring platforms. AI helps to understand the difficult concepts in simple terms, which enhances the confidence about subject. It helps to improve the quality and accuracy of the assignments and ultimately reducing the time spent on academic tasks. Students have faced major issues related to incorrect, inaccurate or confusing information generated through AI app and paid subscription act as a barriers to the effectiveness use of AI tools. Many students are not aware about the ethical guidelines for usage of AI in academics and express a need for proper training to upgrade their skills. Overall, AI tools are beneficial for academic productivity, but it also possesses drawbacks like overdependence, reduced critical thinking, creativity and other cognitive skills.

**Conclusion:**

The study concludes that Artificial Intelligence plays an important role in framing and enhancing the students overall academic performance. AI has significantly contributed to enhance the understanding of academic concepts. It has positive impact on assignment quality, accuracy and effectiveness in work. However the study also highlights the challenges such as over dependency, data security, reduced critical thinking and limited

access due to paid subscriptions. Proper institutional training on ethical and effective use of AI will not only enhance student academic skills but also prepare them for professional exposure and future job opportunities. When used thoughtfully, AI can serve as a powerful support system that enhances learning without compromising educational values.

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