

Original Research Article

AI Literacy among College Students and Its Influence on Academic Performance: A Study of Generative AI Tools

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Abstract

In today's technology-driven world, Artificial Intelligence (AI) is becoming an important part of higher education. College students are increasingly using AI tools such as **ChatGPT, Google Gemini, Microsoft Copilot, Claude, and Perplexity AI for their academic work**. These tools help students prepare assignments and presentations, understand difficult topics, find ideas, improve their writing, and complete academic tasks in less time. However, simply knowing how to use AI is not enough. Students also need to understand whether the information provided by AI is correct, how to use it responsibly, and what problems may arise from depending too much on these tools.

This study focuses on understanding the level of AI literacy among college students and its relationship with their academic performance. It will also study how familiar students are with generative AI tools, how often they use them, and for what academic purposes. The study will further examine the benefits students experience, the difficulties they face, and their understanding of issues such as academic honesty, originality, privacy, and responsible use of AI.

The study will use a **mixed-methods research design, combining both quantitative and qualitative methods**. Quantitative information will be collected through a structured questionnaire using Google Forms.

Interviews and open-ended questions will be used to understand students' personal experiences, opinions, and attitudes towards AI in education.

The study will include college students between 18 and 26 years of age from different academic backgrounds. The research will be limited to colleges in the **Mumbai Metropolitan Region**.

The study is expected to provide a clear picture of how AI literacy is connected with students' academic performance. The findings may also help colleges and teachers plan AI literacy programmes and create practical guidelines for the proper use of AI in education. Overall, the study aims to encourage students to use AI as a helpful learning tool while maintaining independent thinking, originality, and academic responsibility.

Introduction

Artificial Intelligence (AI) is becoming an important part of students' education in today's digital world. Students use tools like ChatGPT and Gemini for assignments, presentations, study support, and generating new ideas. However, students need to understand how to use AI properly and be aware of its limitations. This study focuses on understanding AI literacy among college students and its connection with their academic performance. It also explores students' AI usage, its benefits and challenges, and their awareness of responsible AI use.

Research Objectives

1. To assess the level of AI literacy among college students regarding generative AI tools.
2. To identify the frequency and purpose of using generative AI tools for academic activities.
3. To examine the influence of AI literacy on students' academic performance.
4. To explore students' perceptions of the benefits, challenges, and ethical concerns associated with generative AI tools.
5. To compare AI literacy and usage patterns among students from different age groups (18–20, 21–23, and 24–26 years).
6. To suggest measures for promoting responsible and effective use of generative AI in higher education.

Research Assumptions/ Hypotheses

H1: College students are aware of at least one generative AI tool.

H2: Students use generative AI tools for academic purposes such as assignments, presentations, research, and learning.

H3: Higher AI literacy contributes to improved academic performance and learning efficiency.

H4: Students provide honest and accurate responses in the Google Form questionnaire.

H5: Responsible use of generative AI enhances learning outcomes, while excessive dependence may negatively affect critical thinking and originality.

Research Methodology

- Research Design: Mixed Methods Research Design
- Research Approach: Quantitative and Qualitative (Mixed Method)
- Quantitative Tool: Structured Google Form Questionnaire
- Qualitative Tool: Focus group discussion

Research Limitation

1. **Geographical Limitation** – The study is limited to college students from the Mumbai Metropolitan Region.
2. **FGD Limitation** – The Focus Group Discussions (FGDs) were conducted only with students from Mumbai Colleges.

Scope of the Study

The study includes:

1. Students from different academic streams and years of study.
2. AI tools such as ChatGPT, Google Gemini, Microsoft Copilot, Claude, Perplexity AI, and similar generative AI platforms.
3. Assessment of AI literacy, awareness, frequency of use, ethical considerations, and perceived impact on academic performance.
4. Data collection through Google Forms (quantitative) and selected interviews/open-ended responses (qualitative)* using a mixed-methods research design.

The geographical scope of the study is limited to college students within the selected study area and may not represent all higher education institutions.

Review of Literature

1. Dubey, S. (2025). *Adoption and Impact of Artificial Intelligence in Higher Education: A Study of Colleges in the Western Suburbs of Mumbai.*

Dubey (2025) conducted a mixed-method study among **colleges located in the western suburbs of Mumbai to examine the adoption of artificial intelligence in higher education**. The research included **students**, faculty members, and academic administrators to understand AI awareness, usage patterns, institutional readiness, and perceived academic benefits. The findings indicated that students increasingly use generative AI tools for academic writing, research assistance, presentations, and problem-solving. The study also reported that although AI improves learning efficiency and academic productivity, many students lack formal AI literacy and ethical awareness regarding plagiarism, data privacy, and responsible AI use. The author recommended structured AI literacy programmes and institutional policies to maximise academic benefits while minimising misuse. This study supports the present research by demonstrating that AI literacy is an important factor influencing the effective educational use of generative AI among Mumbai college students.

2. Salaam Bombay Foundation & NMIMS School of Business Management (2025). *AI Awareness among Mumbai Students*

A joint study conducted by the Salaam Bombay Foundation and the NMIMS School of Business Management surveyed 1,050 students from 20 municipal schools in Mumbai to examine awareness and usage of artificial intelligence tools. The study found that nearly 80% of students were aware of AI applications and commonly used them for completing assignments, solving academic problems, and translation. However, the report highlighted excessive dependence on AI tools, reduced independent thinking, and the absence of structured AI literacy education. Teachers also expressed concern that students frequently relied on AI without evaluating the accuracy or credibility of generated information. The report recommended integrating AI literacy into the curriculum and

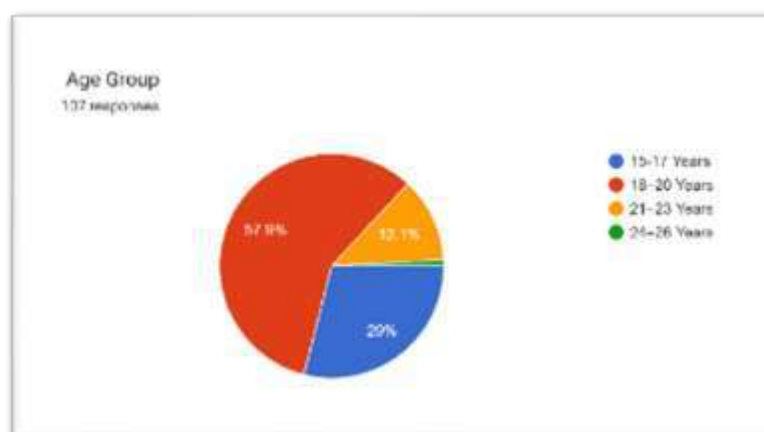
redesigning assessment methods to promote critical thinking rather than rote completion of assignments. Although conducted in schools rather than colleges, the findings provide valuable regional evidence supporting the need for AI literacy education in Mumbai and offer a contextual basis for the present study.

Research Methodology

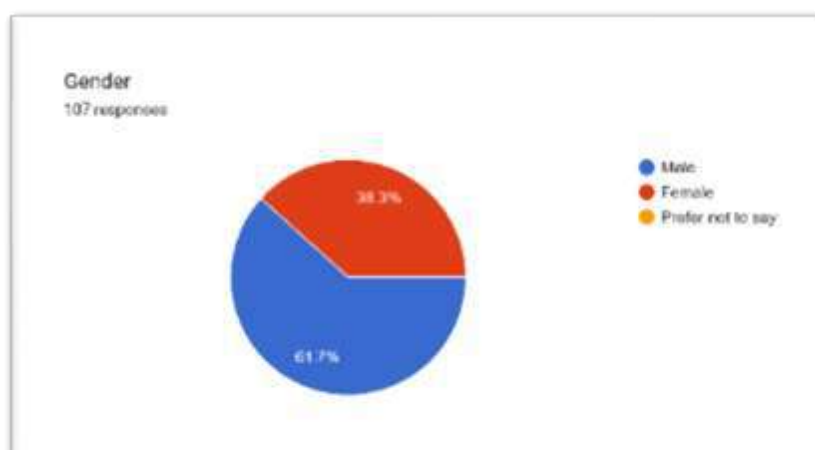
This research uses a **mixed-methods research design**, which includes both quantitative and qualitative methods. The study is based on the following sources of information:

1. **Literature Review (Secondary Data):** Two related research studies were referred to understand previous work on AI awareness and its use among students.
2. **Google Form Responses (Primary Data):** Information was collected directly from college students through a simple questionnaire prepared in Google Forms.
3. **Focus Group Discussion (Primary Data):** A Focus Group Discussion (FGD) was conducted with students to understand their personal experiences, opinions, and views about using AI for academic work.

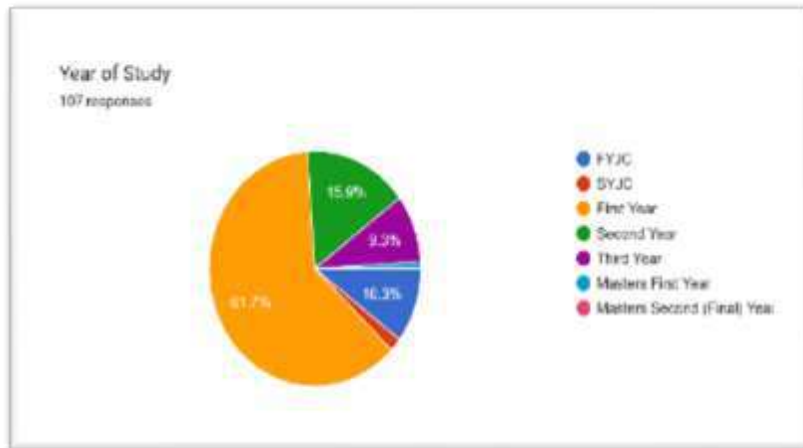
Below, we present the interpretation of the data collected through the Google Form. A total of **107 responses** were received from students studying in different colleges. The responses provide useful information about students' awareness, use, experiences, and views regarding AI in their academic work.



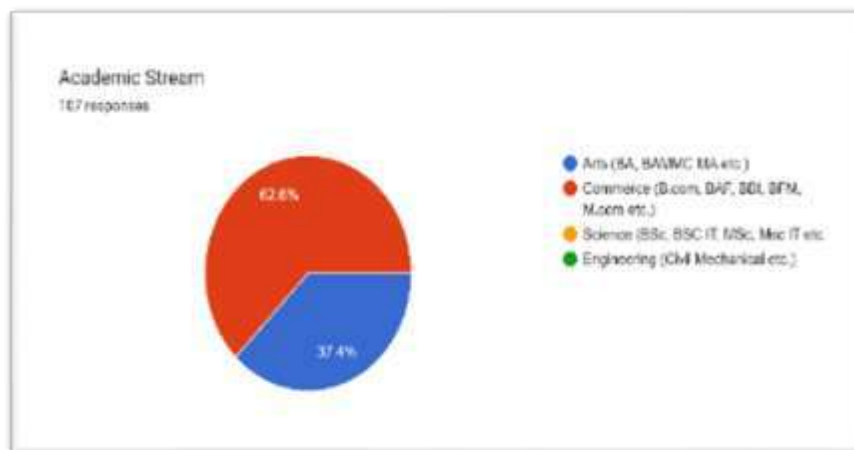
The data shows that **57.9% of respondents are aged 18–20 years**, followed by **29% aged 15–17 years** and **12.1% aged 21–23 years**. Only a very small percentage belong to the **24–26 years** group. Thus, most respondents are between 15 and 20 years of age.



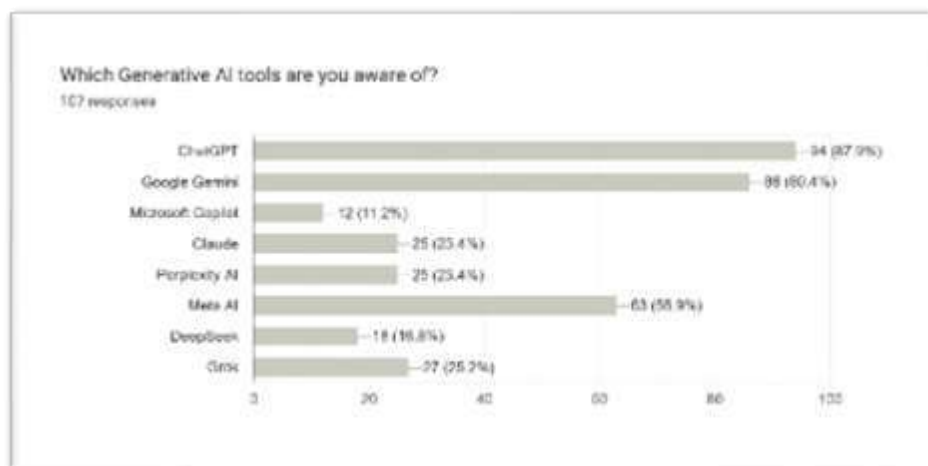
The data shows that **61.7% of respondents are male**, while **38.3% are female**. No respondents selected “**Prefer not to say.**” Thus, the majority of respondents are **male students**.



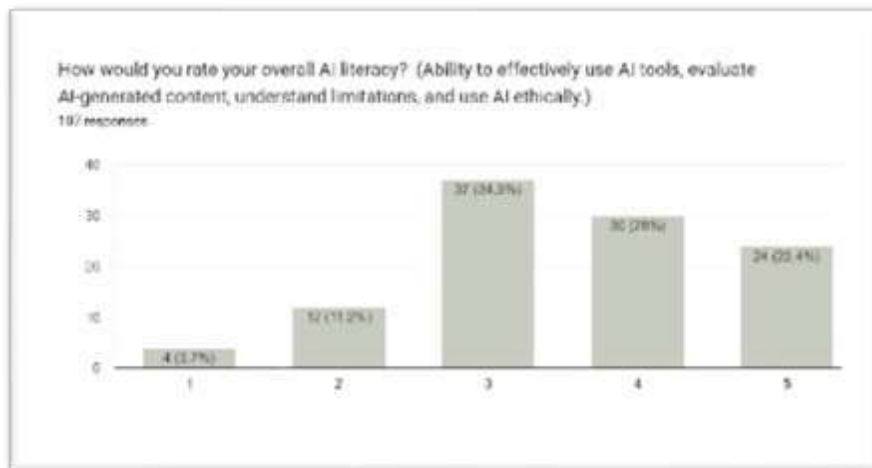
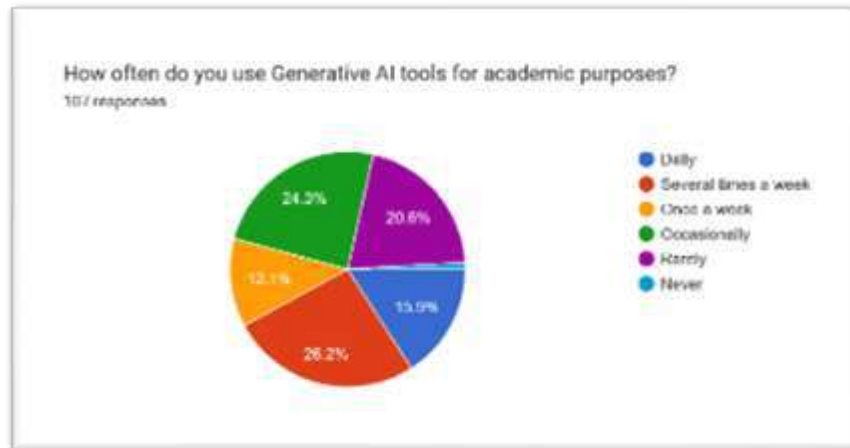
The data shows that **61.7% of respondents are First Year students**, followed by **15.9% in Second Year** and **10.3% in FYJC**. **9.3% are in Third Year**, while only a small percentage belong to the other categories. Thus, most respondents are **First Year students**.



The data shows that **62.6% of respondents belong to Commerce**, while **37.4% belong to Arts**. No respondents are from **Science or Engineering** streams. Thus, the majority of respondents are **Commerce students**.

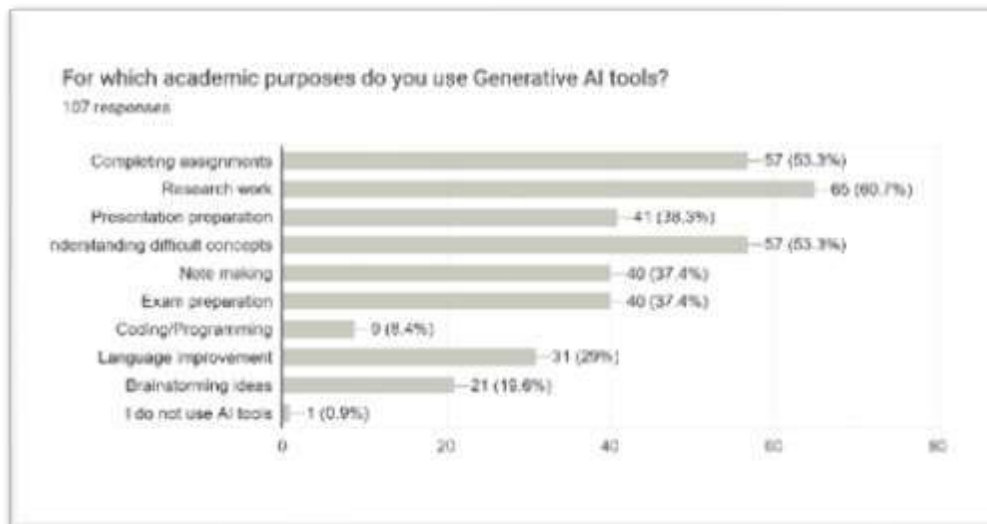


The data shows that **87.9% of respondents are aware of ChatGPT**, making it the most widely known Generative AI tool among the respondents. **Google Gemini** follows with **80.4%**, while **58.9%** are aware of **Meta AI**. Awareness of **Grok (25.2%)**, **Claude (23.4%)**, and **Perplexity AI (23.4%)** is comparatively lower. Only **16.8%** are aware of **DeepSeek**, and **11.2%** are aware of **Microsoft Copilot**. Thus, the findings indicate that **ChatGPT and Google Gemini have the highest awareness among students**, while awareness of other Generative AI tools remains relatively limited.

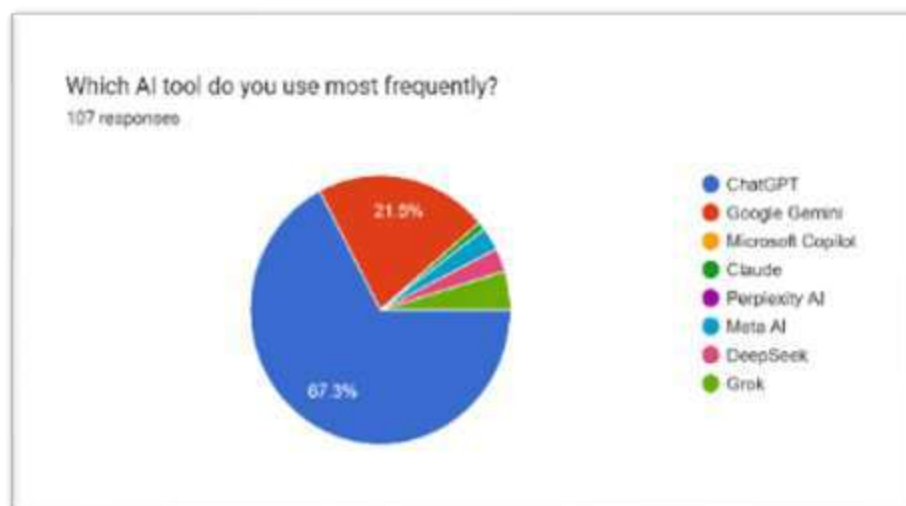


The data shows that **34.6% of respondents rated their AI literacy at Level 3**, followed by **28% at Level 4** and **22.4% at Level 5**. Only **11.2%** rated themselves at Level 2, while **3.7%** gave the lowest rating of Level 1. Thus, **most respondents (85%) rated their AI literacy between 3 and 5**, indicating a **moderate to good level of AI literacy** among the students.

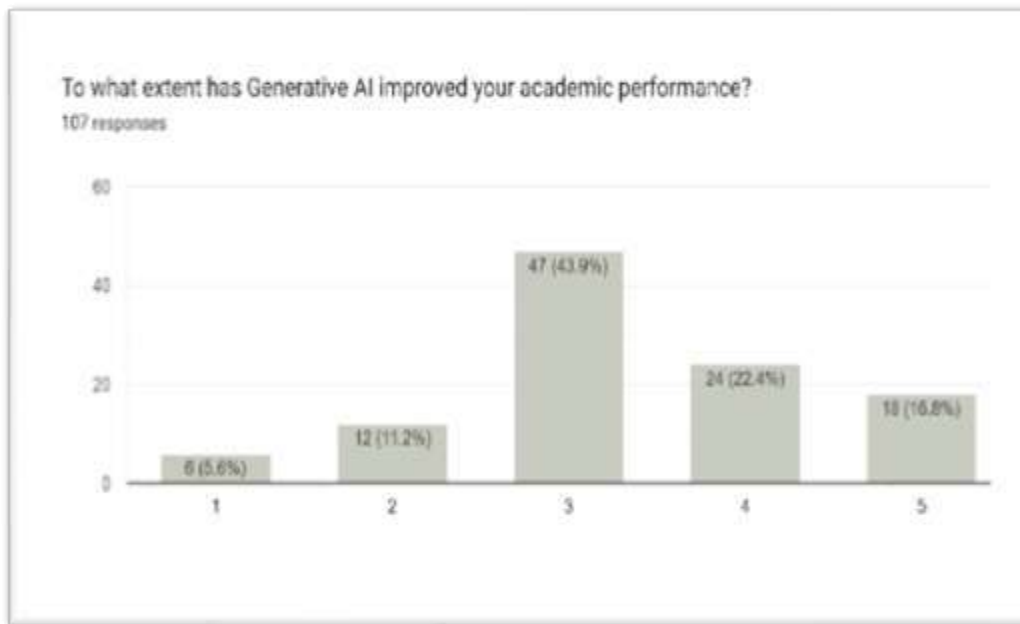
The findings show that **Generative AI is widely used by students for academic purposes**. The largest group (**26.2%**) uses it several times a week, followed by **24.3%** who use it occasionally. Overall, the results indicate a **growing adoption of Generative AI in academic learning**.



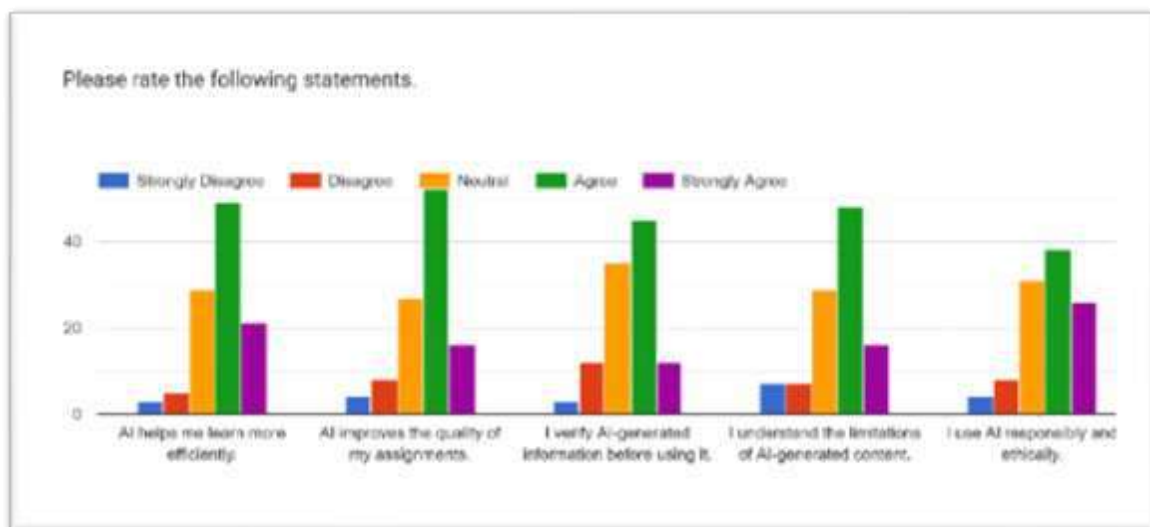
The findings show that students mainly use Generative AI for **research work (60.7%)**, followed by **completing assignments and understanding difficult concepts (53.3% each)**. It is also used for **presentation preparation, note-making, exam preparation, and language improvement**. Overall, Generative AI is mainly used as a **learning and academic support tool**.



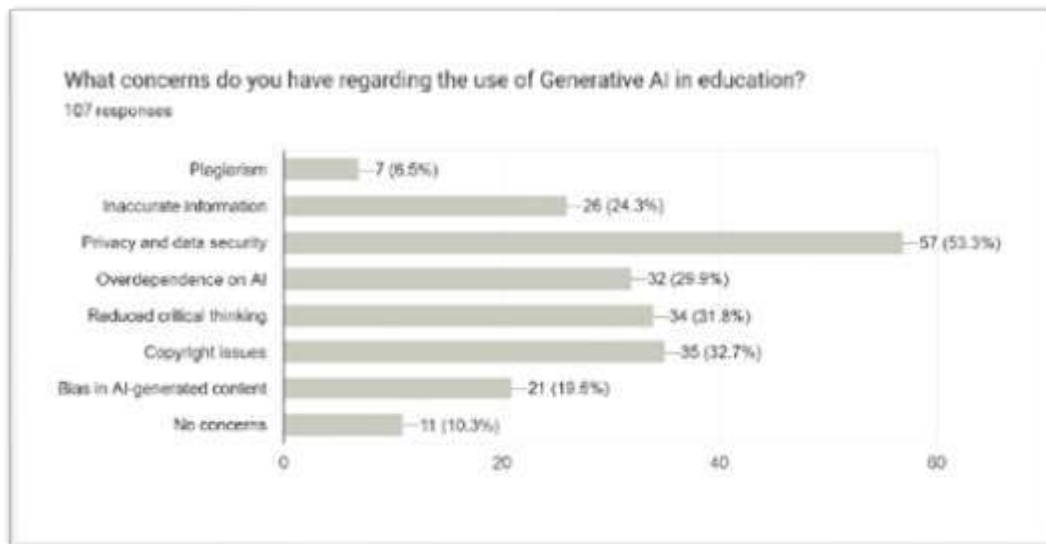
The findings show that **ChatGPT is the most frequently used AI tool (67.3%)**, followed by **Google Gemini (21.5%)**. Other tools such as Microsoft Copilot, Claude, Perplexity AI, Meta AI, DeepSeek, and Grok have much lower usage. Overall, **ChatGPT is clearly the preferred Generative AI tool among the respondents**.



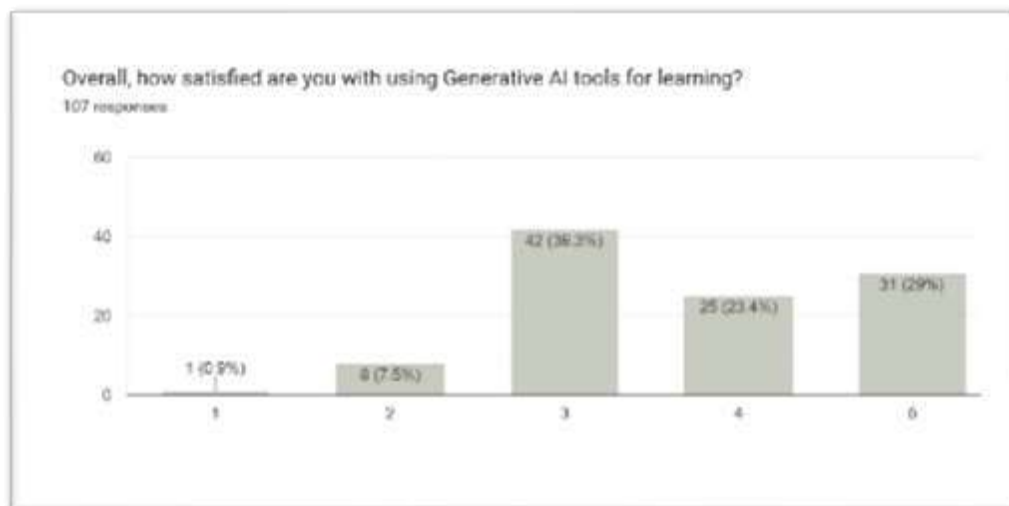
The findings show that **43.9% of students rated the improvement at level 3**, while **22.4% rated it at level 4** and **16.8% at level 5**. This indicates that most students feel **Generative AI has had a moderate to significant positive impact on their academic performance**.



The findings show that **most students agree that Generative AI helps them learn more efficiently and improves the quality of their assignments**. Many students also **verify AI-generated information** and **understand the limitations of AI-generated content**. Overall, students show a **positive and responsible attitude toward using Generative AI for academic purposes**.



The findings show that the **main concern is privacy and data security (53.3%)**, followed by **ethical issues (32.7%)**, **reduced critical thinking (31.8%)**, and **overdependence on AI (29.9%)**. Concerns about inaccurate information and bias are also reported. Overall, students recognize several **risks associated with the use of Generative AI in education**.



Overall, **52.4% of respondents were highly satisfied (ratings 4–5)**, while **39.3% gave a moderate rating of 3**. Only **8.4% were dissatisfied**, indicating that Generative AI tools are generally **well-received for learning**.

In your opinion, how can colleges promote the responsible and effective use of Generative AI among students?

107 responses

Proper Information about ai how to use it

Being a student I am giving a rating of 4 to AI and AI takes our private information, this is the worst thing.

Yes 🍌 ai generation is good my every problem has solved it

they should aware all the students about using of AI I think we are using AI Because understand the concept that are not clear if the concept is clear so don't use most of time college said I want this this on time so at that moment we stop thinking to do it by itself at that moment we directly use AI tools without thinking that we are giving our knowledge to that particular tools and most of time we use AI tools to clear some points that what should I do or not so using AI tools so many points is clear that what I have to do or not and basically its very easy to use

College to teach students how to use AI ethically and responsibly.

College can promote responsible and effective use of generative AI by teaching digital literacy workshop setting clear guidance and ethical use and plagiarism and integrated ai to force work as a assistant for research business formation and innovation without their subsequence for thinking

The responses suggest that colleges should conduct **AI literacy workshops**, provide clear guidelines on **ethical and responsible use**, and educate students about **privacy, plagiarism, and overdependence on AI**. Students also feel that AI should be used as a **support tool for research and learning, not as a replacement for independent thinking**.

In your opinion, what other topics should be researched?

107 responses

Jantar mantar

Cutting edge research should focus on the socio-technical impacts of Agentic AI, the integration of everything-to-grid energy, and the ethical deployment of personalized mRNA cancer vaccines

Honestly, I'd want to know if leaning on AI is quietly eroding critical thinking and writing skills over time, that feels like the big unanswered question

Education related

I want to learn more about AI tools in detail since I want to learn more about it vastly. So I'd prefer the topic AI tools

NA

Researchers should study AI ethics, privacy, accuracy, and the safe use of AI in education and daily life.

The responses suggest that future research should focus on **AI governance, education, career development, environmental sustainability, and public health**. Some respondents also highlighted the need to study the **impact of AI on critical thinking and writing skills**, as well as the wider **social and technological effects of generative AI**.

Focus Group Discussion

The researcher conducted **two Focus Group Discussions (FGDs)** with current college students. The students were asked two questions:

1. **What is your opinion about AI tools?**
2. **Are AI tools safe for your academic journey?**

1. Opinion about AI tools:

Students said that **AI tools are very helpful for learning, understanding difficult concepts, completing assignments, conducting research, and improving their academic work.** They also felt that AI saves time and provides quick access to information.



2. Are AI tools safe for academic use?

Students felt that **AI tools can be safe and useful for academic purposes if they are used responsibly.** They believe students should not depend completely on AI and should verify the information, protect their personal data, and use AI as a learning support rather than a replacement for their own thinking.

Findings

1. **Moderate to good AI literacy:** Most students have moderate to good knowledge of generative AI tools.
2. **Academic use:** AI is mainly used for research (60.4%), assignments, and understanding difficult concepts (52.8%).
3. **Positive academic impact:** Students perceive generative AI as having a moderate to positive impact on their academic performance and learning efficiency.
4. **Need for responsible use:** Privacy, copyright, reduced critical thinking, and overdependence are major concerns among students.

Conclusion

Generative AI is a useful academic support tool that improves learning efficiency and assists students in research and academic tasks. However, responsible use, independent thinking, and verification of AI-generated information are essential.

Recommendations

- Conduct regular AI literacy workshops.
- Create clear ethical AI-use guidelines.
- Promote critical thinking and information verification.
- Educate students about privacy, plagiarism, and copyright.
- Encourage AI as a support tool, not a replacement for independent thinking.

Reference

1. **Dubey, S. (2025).** *Adoption and Impact of Artificial Intelligence in Higher Education: A Study of Colleges in the Western Suburbs of Mumbai.* International Journal of Research & Technology, 13(S4), 574–581. <https://doi.org/10.64882/ijrt.v13.iS4.832>
2. **Salaam Bombay Foundation & NMIMS School of Business Management (2025).** *AI Awareness among Mumbai Students.* Times of India - https://timesofindia.indiatimes.com/city/mumbai/8-in-10-civic-school-students-in-mumbai-aware-of-ai-tools-finds-study-flags-overdependence-and-calls-for-exam-reform/articleshow/130449937.cms?utm_source=chatgpt.com
3. **AI Literacy among College Students and Its Influence on Academic Performance: A Study of Generative AI Tools** Google Form Link <https://forms.gle/cABGLtCdxZqFJiwS9>