

**EFFECTS OF OVER-RELIANCE ON GENERATIVE AI ON COLLEGE STUDENTS' CRITICAL THINKING
SKILLS: A QUALITATIVE STUDY OF STUDENT AND FACULTY PERSPECTIVES**

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Abstract:

The rapid adoption of generative artificial intelligence tools such as ChatGPT and Google Gemini has significantly influenced teaching and learning practices in higher education. These tools assist students in completing assignments, generating ideas, summarizing academic content, and organizing information. While generative AI improves efficiency and accessibility, concerns have emerged regarding its potential impact on students' critical thinking abilities and independent learning.

This study explores the perceived effects of reliance on generative AI on college students' critical thinking skills and examines faculty perspectives on the increasing use of these technologies in academic work. A qualitative exploratory research design was adopted using focus group discussions and student interviews.

Keywords: *Generative Artificial Intelligence, ChatGPT, Google Gemini, Higher Education, Critical Thinking, Independent Learning, Qualitative Research*

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Introduction:

The rapid development of generative artificial intelligence (AI) has transformed higher education, with tools such as ChatGPT and Google Gemini increasingly used by students for assignments, content creation, problem-solving, and summarizing information (Kasneji et al., 2023). While these tools enhance efficiency and accessibility, there is growing concern that over-reliance may negatively affect students' critical thinking skills (Selwyn, 2016; Turkle, 2017).

Critical thinking enables students to analyze information, evaluate arguments, and develop logical conclusions—skills essential for academic success and lifelong learning. The availability of AI-generated outputs may reduce the need for independent reasoning, limit cognitive engagement, and affect originality in academic work (Lee & Low, 2024).

Faculty members have also expressed concerns regarding academic integrity, plagiarism, and the potential long-term impact of AI on learning outcomes (Monib, Ahmed, & Rahman, 2024). Understanding both student and faculty perspectives is crucial to assess the educational impact of generative AI.

This study explores how excessive reliance on generative AI influences the critical thinking abilities of college students, adopting a qualitative approach with focus group discussions involving students from different academic streams and faculty from multiple disciplines.

Literature Review:

The rapid development of generative Artificial Intelligence (AI) has significantly influenced teaching and learning practices in higher education. Tools such as ChatGPT, Google Gemini, and Microsoft Copilot are increasingly used by students to assist with

academic activities including writing assignments, summarizing information, generating ideas, and solving complex problems. While these technologies provide quick access to information and improve productivity, researchers have raised concerns about their potential impact on students' critical thinking and independent learning abilities.

Research on digital technologies in education has long highlighted their influence on learning behavior. Neil Selwyn (2016) argues that digital technologies can enhance learning accessibility and efficiency but may also encourage passive learning when students rely excessively on automated systems. Similarly, Sherry Turkle (2017) suggests that heavy dependence on digital technologies may weaken reflective thinking and meaningful intellectual engagement.

Recent studies have examined the role of generative AI in education. Research by Enkelejda Kasneci and colleagues (2023) highlights that tools such as ChatGPT can support students in writing and learning tasks, but excessive reliance on AI-generated responses may reduce independent reasoning and cognitive engagement. In addition, Lee and Low (2024) emphasize the need for critical AI literacy, arguing that students should learn to evaluate AI-generated information rather than accept it without analysis.

Other studies highlight both the benefits and challenges of generative AI in higher education. Monib and colleagues (2024) note that AI technologies can support personalized learning and help students understand complex topics, although concerns about academic integrity and dependency remain. Similarly, Korchak and colleagues (2025) found that university students frequently use AI tools for assignments and research support, improving efficiency but raising questions about their impact on learning behavior. A systematic review by Balart, Díaz, and Shryock (2026) also suggests that while AI tools can enhance learning

when used appropriately, excessive reliance may reduce deep cognitive engagement.

Overall, the existing literature highlights both the opportunities and challenges of generative AI in higher education. While these technologies can improve learning efficiency and support idea development, concerns remain regarding their potential influence on students' critical thinking, originality, and independent problem-solving. Therefore, examining the perceptions of both students and faculty members is important to better understand the educational implications of generative AI and promote its responsible use in academic settings.

Research Gap:

Although the current body of research thoroughly highlights the possible downsides of generative AI in higher education—including diminished cognitive involvement (Kasneci et al., 2023) and the importance of developing critical AI literacy (Lee & Low, 2024)—alongside explorations of its teaching advantages and drawbacks (Balart, Díaz, & Shryock, 2026), much of this work stays theoretical or relies on quantitative analyses of adoption trends (Korchak et al., 2025). This leaves a notable void in grasping the personal, day-to-day realities faced by those most directly affected. Existing research rarely delves into how students and faculty personally distinguish between helpful integration and excessive dependence, nor does it offer detailed, side-by-side insights into the mental and affective aspects of this issue. As a result, there is a pressing need for a thorough qualitative exploration that examines the subtle—and often differing—viewpoints of students and instructors alike, to reveal how over-reliance on generative AI is experienced as influencing critical thinking in authentic educational settings, shifting the focus from documented hazards to the actual lived encounters within the academic community.

Research Objectives:

1. To examine the extent of generative AI usage among college students for academic activities such as assignments, research, and learning tasks.
2. To explore students' perceptions of the benefits and limitations of generative AI tools in their academic work.
3. To analyze faculty perspectives on how the use of generative AI affects students' learning behaviour, originality, and academic performance.
4. To identify strategies for responsible and balanced use of generative AI in higher education while promoting critical thinking and academic integrity.

Research Methodology:

This study adopted a qualitative approach to explore the impact of generative AI tools on students' critical thinking. Data were collected through student interviews and faculty focus group discussions. A total of 50 participants were involved: 40 undergraduate students from FYBA, SYBA, FYBCOM, and SYBCOM programs, and 10 faculty members from Commerce, Psychology, Sociology, Mathematics, and History. The use of focus groups and interviews allowed interactive discussions and provided diverse perspectives on students' academic behaviour, assignment originality, and the role of AI in higher education.

Data Analysis and Thematic Findings:

The study adopted a qualitative research approach using student interviews and faculty focus group discussions to explore the influence of generative AI tools on students' critical thinking skills. A total of 40 undergraduate students from FYBA, SYBA, FYBCOM, and SYBCOM programs participated in the study and shared their experiences regarding the use of generative AI tools in academic activities. In addition, focus group discussions were conducted with 10 faculty members from different academic departments including Commerce, Psychology, Sociology,

Mathematics, and History. Faculty participants provided insights into students' academic behavior, originality of assignments, and the influence of generative AI tools on learning outcomes. Overall, the study included 50 participants, comprising 40 students and 10 faculty members from multiple academic disciplines. The focus group discussions and student interviews explored participants' experiences and perceptions regarding the use of generative AI tools and their influence on students' critical thinking skills. The qualitative data obtained from these discussions were analyzed using thematic analysis, which helped identify recurring patterns and key themes emerging from the responses of both students and faculty members. Perceptions regarding the use of generative AI tools and their influence on students' critical thinking skills. The qualitative data obtained from these discussions were analysed using thematic analysis, which helped identify recurring patterns and key themes emerging from the responses of both students and faculty members.

Theme 1: Increasing Dependence on Generative AI for Academic Work

Both students and faculty members reported a noticeable increase in the use of generative AI tools for academic purposes. Students frequently use AI tools for completing assignments, summarizing academic content, preparing notes, and generating ideas for presentations and projects. Faculty members from the Commerce department observed that many students rely heavily on generative AI tools when preparing assignments and theoretical answers. One faculty participant noted that students often submit responses that appear highly structured and similar to AI-generated content, indicating reliance on such tools. Similarly, Psychology faculty members reported that students frequently use generative AI for preparing research papers, presentations, and written responses. AI tools are often used to structure answers and

improve the clarity of written communication.

Students participating in the focus group discussions also acknowledged that they frequently use AI tools such as ChatGPT and Gemini for academic tasks. Many students stated that these tools help them save time, understand complex topics, and organize their responses more effectively.

Faculty members from the History department also observed widespread use of AI tools among students while preparing assignments. However, they emphasized that preventing the use of AI entirely in higher education is difficult due to the easy availability of such technologies.

These findings suggest that generative AI tools have become an important academic support resource for students, particularly for content generation and idea development.

Theme 2: Subject-Based Variation in AI Usage

The study found that the use of generative AI varies across different academic disciplines. Faculty members from the Mathematics department reported that the scope of AI usage in mathematics is relatively limited because many mathematical problems require precise calculations and step-by-step reasoning. According to faculty observations, AI-generated solutions sometimes contain computational errors, particularly in numerical problems such as simple interest or compound interest calculations. These inaccuracies often allow faculty members to identify whether students have relied solely on AI-generated responses. At the same time, mathematics faculty acknowledged that newer AI tools are increasingly capable of solving certain numerical problems and multiple-choice questions. Despite these advancements, faculty members emphasized that students still need to understand the reasoning behind the solutions.

Similarly, Sociology faculty members observed that many students rely less on AI tools because assignments require references from research papers,

textbooks, and academic sources. Faculty members also verify students' understanding by asking follow-up questions about their assignments, which helps ensure the originality of students' work.

These observations suggest that subjects involving analytical reasoning, practical problem solving, or academic referencing tend to reduce complete dependence on AI tools.

Theme 3: Impact on Critical Thinking Skills

Faculty members across departments expressed concerns that excessive reliance on generative AI may influence students' critical thinking and analytical abilities.

Mathematics faculty members observed that when students rely heavily on AI-generated answers, they may avoid solving problems independently, which can affect their analytical thinking skills. Faculty participants indicated that this trend has the potential to reduce students' engagement in independent problem solving.

Students participating in the focus group also acknowledged that the availability of ready-made answers sometimes reduces the effort required to analyze problems or develop original responses.

However, faculty members from the Commerce and Psychology departments also highlighted that AI tools can have positive effects when used appropriately. Some faculty participants noted that AI can help students generate new ideas, improve language structure, and organize responses more effectively.

These findings suggest that while AI tools can improve efficiency and support academic work, excessive dependence may limit opportunities for independent thinking and deeper conceptual understanding.

Theme 4: Strategies Adopted by Faculty to Reduce Over-Reliance on AI

Faculty members across departments reported adopting several strategies to reduce students' excessive reliance on generative AI tools while still encouraging

responsible use of technology.

Faculty members from the Commerce department assign case-based tasks, business model preparation projects, and academic exhibitions to promote practical learning. They also conduct viva examinations and cross-questioning sessions to verify whether students genuinely understand the concepts presented in their assignments.

Mathematics faculty members emphasized the importance of redesigning question papers and encouraging students to solve problems independently. Some faculty members reported randomly checking assignments and asking students to explain their solutions during discussions or viva sessions.

Psychology faculty members focus on experiential learning methods, such as field experiments, interviews, diary writing, and reflective assignments. For example, students may be asked to maintain self-reflection diaries or analyse their own experiences. These types of assignments require personal observation and cannot easily be completed using AI-generated responses.

Similarly, History and Sociology faculty members emphasized that promoting limited and responsible use of AI tools, rather than completely banning them, may be the most practical approach in higher education.

Faculty members also highlighted the importance of oral discussions, assignment explanations, and cross-verification as effective ways to ensure that students genuinely understand the content they submit.

Discussion:

The findings of this study indicate that generative AI tools have become increasingly integrated into students' academic practices. Students frequently use AI platforms to generate academic content, summarize information, and assist with assignments.

However, the extent of AI usage varies across disciplines. Subjects that involve numerical problem solving, research-based assignments, or experiential

learning activities tend to reduce the likelihood of excessive dependence on AI-generated responses.

Faculty members across departments emphasized that completely restricting AI usage in higher education may not be practical. Instead, the focus should be on encouraging responsible and guided use of AI technologies.

Assignments involving case studies, field projects, experiential learning, and oral evaluation methods can help reduce students' dependence on AI-generated content while promoting independent thinking and deeper understanding. These findings highlight the need for educational institutions to integrate AI literacy and ethical guidelines into academic practices. Encouraging students to use AI as a supportive learning tool rather than a substitute for independent thinking is essential for maintaining the development of critical thinking skills in higher education.

Conclusion:

The study shows that generative AI tools are increasingly used by students in higher education for tasks such as completing assignments, summarizing content, generating ideas, and organizing written work. While these tools improve efficiency and help students understand complex topics, excessive dependence on AI may reduce independent thinking, analytical reasoning, and problem-solving skills. The impact of AI usage also varies across academic disciplines, with subjects requiring numerical analysis, research references, or experiential learning showing lower dependence on AI-generated responses. Rather than restricting AI tools completely, educational institutions should promote their responsible and guided use. Teaching strategies such as case-based assignments, field projects, viva examinations, and discussions can encourage active learning. Overall, generative AI should be used as a supportive tool that enhances learning while maintaining students' critical thinking and ethical awareness.

Recommendations:

1. Educational institutions should promote the responsible and ethical use of generative AI among students.
2. Faculty should design case-based and project-based assignments that encourage independent analysis.
3. Viva examinations, presentations, and discussions should be used to assess students' understanding.
4. Institutions should introduce AI literacy programs for responsible academic use.
5. Experiential learning activities such as field projects and research tasks should be encouraged to reduce overdependence on AI.

Limitations of the Study:

The study has several limitations that should be considered when interpreting the findings. First, it involved a relatively small sample of 50 participants (40 students and 10 faculty members), which may not represent the views of all higher education institutions. Second, the qualitative approach focused on participants' perceptions rather than measuring the statistical impact of generative AI on critical thinking. Third, the study included only five academic disciplines, so AI usage patterns in other fields may differ. Finally, the findings rely on self-reported responses, which may not always reflect actual usage, and rapid advancements in AI technology may change usage patterns over time. Future research should include larger and more diverse samples, use mixed-method approaches, and examine the long-term effects of generative AI on students' learning and critical thinking.

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