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The Relationship Between Generative AI Usage and Perceived Productivity, Creativity, and Independent Thinking Among Higher Education Students: A Quantitative Study

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Abstract- *Generative Artificial Intelligence (GenAI) tools such as ChatGPT, Gemini, and Microsoft Copilot are increasingly used by college students for learning, assignments, problem-solving, and generating ideas. This study examined the relationship between Generative AI usage and students perceived productivity, creativity, and independent thinking.A quantitative research method was used to collect the data from 118 college students through a Google Forms questionnaire. The collected data were analysed with the help of descriptive statistics, Cronbachs Alpha and Pearson correlation.The results showed that 83.9% of students used GenAI daily or several times a week for academic tasks. A statistically significant positive relationship was found between GenAI usage and perceived productivity (r = 0.355, t = 4.09). There was no statistically significant relationships were found between GenAI usage and creativity (r = 0.128, t = 1.39) or independent thinking (r = 0.157, t = 1.70). The independent thinking findings should be interpreted cautiously because the scale shows poor internal consistency.Overall, the study shows that more frequent GenAI usage was associated with higher self-reported productivity among the surveyed students. However, no significant relationships found between GenAI usage and creativity or independent thinking. Further research is required to investigate how students can use GenAI to develop their independent-thinking and problem-solving skills.*

Keywords: Generative Artificial Intelligence, ChatGPT, College Students, perceived Creativity, perceived Productivity, perceived Independent Thinking.

I. INTRODUCTION

GenAI tools are becoming common in education. Students use GenAI tools to understand topics, generate content, to solve problems, to write code, and for various academic tasks.

GenAI tools can provide explanations, suggestions, and ideas that students can use in their academic work. These tools can help students explore alternative solutions of the problem and generate ideas. GenAI has become an area of interest in discussions about students learning experiences and academic productivity.

However, use of the GenAI tools raises concerns. Students may rely on AI generated ideas and solutions rather than developing their own answers. The frequent use of GenAI tools may raise questions about students confidence in completing the academic tasks on their own and their engagement in critical thinking and problem-solving.

Therefore, understanding students experiences with GenAI requires studying both its perceived benefits and the concerns associated with its use. This study focuses on three areas perceived productivity, perceived creativity and perceived independent thinking. It aims to examine the relationship between GenAI usage and these areas among college students using quantitative survey data.

II. PROBLEM STATEMENT

The increasing use of GenAI tools among college students has affected how students learn, generate ideas, solve problems and complete academic tasks. Students may perceive GenAI as helpful for improving their productivity and generating ideas. However, concerns remain about whether frequent use of these tools is associated with students' creativity and independent thinking.

Previous research has examined various aspects of AI usage in education, including creativity, learning outcomes, critical thinking, and academic performance. However, there is a need to examine the relationships between Generative AI usage and students' perceived productivity, creativity, and independent thinking within the same student population.

Therefore, the problem addressed in this study is to examine the relationship between Generative AI usage and perceived productivity, creativity, and independent

thinking among college students using quantitative survey data.

III. IMPORTANCE OF THE STUDY

This study is important because Generative Artificial Intelligence (GenAI) is becoming a regular part of students academic activities. Understanding students' reported experiences with these tools can help identify the perceived benefits of GenAI usage and areas that require further investigation.

The study may be useful to:

- **Students:** To understand the potential benefits and concerns associated with GenAI usage and the importance of maintaining independent thinking and problem-solving skills.
- **Teachers:** To gain insights into students' use of GenAI and its relationship with their perceived productivity, creativity, and independent thinking.
- **Educational Institutions:** To support the development of appropriate guidelines for the responsible use of GenAI in academic activities.
- **Researchers:** To provide additional evidence about the relationship between GenAI usage and students' perceived productivity, creativity, and independent thinking.
- **Future Studies:** To provide a basis for further research using larger samples, more reliable measurement scales, and different research methods to examine these relationships.

IV. LITERATURE REVIEW

A. Generative AI in Higher Education

Bhullar, P. S., Joshi, M., & Chugh, R. (2024) researched the use of ChatGPT in higher education by reviewing 47 research papers. They found that ChatGPT is being used in areas such as learning, student engagement, research, and academic work. They also found concerns about plagiarism and academic integrity.

McGrath, C., Farazouli, A., & Cerratto-Pargman, T. (2024) conducted the research on Generative AI chatbots in higher education. They found that AI can support students and teachers, but it can also create problems related to learning, assessment, and academic work.

Simmons, J. L. (n.d.) studied the use of Generative AI in online higher education courses. The study was focused on student engagement, motivation, and learning. It showed that GenAI can be used as a support tool in online education.

B. Generative AI and Student Creativity

Habib, S., Vogel, T., Anli, X., & Thorne, E. (2024) studied the effect of Generative AI on student creativity. They found that AI can help students generate ideas, but it may also create concerns about students' creativity and confidence in their own ideas.

Urban, M., Dechterenko, F., Lukavsky, J., Hein, V., Svacha, F., Brom, C., & Urban, K. (2023) studied ChatGPT and creative problem-solving among university students. They found that students using ChatGPT produced better and more original solutions. However, students sometimes had difficulty judging the quality of their AI-supported answers.

Toma, R. B., & Yánez-Pérez, I. (2024) studied the effect of ChatGPT on undergraduate students' creativity over 10 weeks. They found that some students improved while others showed lower creativity. Overall, the study did not find a clear negative effect of ChatGPT on creativity.

Elanwar, R. (2025) studied the use of Generative AI for creative learning, problem-solving, and programming. The study found that GenAI can help students develop solutions and improve their learning when it is used as a support tool.

The Korean Creativity Education Association, & Lee, Y. (2026) studied how university students use AI instead of doing some thinking themselves during creative problem-solving. The study showed that students may transfer some of their thinking to AI, which can be important when studying creativity and independent thinking.

Wang, S., & Wang, Y. (2026) studied the relationship between Generative AI and creativity using a meta-analysis. The study provided overall evidence about how GenAI may affect students' creative performance.

C. Overall Findings

The studies show that GenAI can help students with learning, creativity, problem solving and academic work. The results are not always the same. Some studies shows positive effects on creativity, while other raises concerns about dependence on AI and reduced independent thinking. Therefore, the present study examines the relationship between GenAI usage, creativity, productivity, and independent thinking among college students.

V. RESEARCH GAP

The recent studies have studied the use of GenAI in higher education. However, there are still some areas that need more research.

1. **Limited examination of multiple factors together:** Previous research has examined the areas such as creativity, academic performance, and critical thinking. Further research can examine perceived productivity, creativity, and independent thinking together within the same student population.
2. **Students regular use of GenAI:** Further research can explore how college students use GenAI tools in their everyday academic activities rather than focusing only on specific tasks or experiments.
3. **AI dependence and independent thinking:** Students may rely on AI for ideas, answers, and problem-solving. Further research is needed to understand whether GenAI usage is associated with perceived creativity and perceived independent thinking.
4. **Research involving Indian college students:** Studies involving Indian college students can provide additional insights into their GenAI usage and reported academic experiences.
5. **Productivity and thinking-related factors**: It is useful to examine perceived productivity alongside creativity and independent thinking to understand students experiences with GenAI more comprehensively.
6. **Quantitative survey evidence**: Quantitative surveys can help identify patterns of GenAI usage and examine its statistical relationship with students perceived academic outcomes.

Therefore, this study examines the relationship between Generative AI usage and perceived productivity, creativity, and independent thinking among college students using quantitative survey data.

VI. RESEARCH QUESTIONS

Based on the identified research gap, the study aims to answer the following research questions:

RQ1. What are the usage patterns and purposes of Generative AI among college students?
RQ2. What is the relationship between GenAI usage and students perceived academic productivity?
RQ3. What is the relationship between use of Generative AI and students perceived creativity?
RQ4. What is the relationship between use of Generative AI and students perceived independent thinking?

VII. RESEARCH OBJECTIVES

The primary objective of this research is to examine the relationship between Generative AI usage, perceived creativity, perceived productivity, and perceived independent thinking among college students.

The specific objectives are:

1. To identify the frequency and purposes of Generative AI usage among college students.
2. To examine the relationship between Generative AI usage and students perceived academic productivity.
3. To examine the relationship between Generative AI usage and students perceived creativity.
4. To examine the relationship between Generative AI usage and students perceived independent thinking.
5. To understand students confidence in completing academic tasks without Generative AI.
6. To provide insights into the responsible and effective use of Generative AI in higher education.

VIII. HYPOTHESES

The following null and alternative hypotheses were formulated to examine the relationships between Generative AI usage and students perceived productivity, creativity and independent thinking.

$H0_1$: There is no statistically significant relationship between Generative AI usage and students perceived academic productivity.
H1: There is a statistically significant relationship between Generative AI usage and students perceived academic productivity.
$H0_2$: There is no statistically significant relationship between Generative AI usage and students perceived creativity.
H2: There is a statistically significant relationship between Generative AI usage and students perceived creativity.
$H0_3$: There is no statistically significant relationship between Generative AI usage and students perceived independent thinking.
H3: There is a statistically significant relationship between Generative AI usage and students perceived independent thinking.

IX. RESEARCH METHODOLOGY

A. Research Design

This study uses a quantitative, survey based research design to examine the relationship between Generative AI usage and students perceived productivity, creativity and independent thinking. It also examines students reported confidence in completing academic tasks without Generative AI.

B. Population and Sampling

The target population of this study consists of college students who use Generative AI for academic purposes.

A convenience sampling method was used because the questionnaire was shared with students through student networks and online platforms.

A total of **118 valid responses** were collected and used for the analysis.

C. Data Collection

Primary data was collected using a structured Google Forms questionnaire. The questionnaire included questions related to:

- Demographic information
- Generative AI usage
- Creativity
- Productivity
- Independent thinking
- Confidence in completing academic tasks without Generative AI

The questionnaire includes multiple-choice questions and statements which are measured using a **5-point**

Likert scale:

1. Strongly Disagree
2. Disagree
3. Neutral
4. Agree
5. Strongly Agree

The questionnaire was designed to collect students' opinions and experiences regarding their use of Generative AI in academic activities.

D. Variables of the Study

Variable	Role	Measurement
Generative AI Usage	Independent variable	Regular use of GenAI for academic work (Q6–Q9)
Perceived Productivity	Dependent variable	Perceived time savings and faster completion of academic work (Q14–Q17)
Perceived Creativity	Dependent variable	Perceived ability to generate ideas and creative solutions (Q10–Q13)
Perceived Independent Thinking	Dependent variable	Developing original ideas, attempting to solve problems independently, and evaluating AI suggestions (Q18–Q20)
Confidence Without AI	Additional variable	Self-reported confidence in completing academic tasks without GenAI (Q21)

E. Research Procedure

The Research was conducted through the following steps:

1. Reviewed the existing research on Generative AI and higher education.
2. Identified the research variables, questions and hypotheses.
3. Prepared a questionnaire based on the research objectives.
4. Shared the questionnaire with students using Google Forms.
5. Collected responses from college students.
6. Checked the responses and removed incomplete or unsuitable entries.
7. Converted the Likert-scale responses into numerical values for analysis.
8. Analysed the data using descriptive statistics, reliability analysis, and correlation analysis.
9. Used Google Forms charts and response summaries to understand the results.
10. Interpreted the findings according to the research questions and hypotheses.

F. Data Analysis Methods

The collected data was analysed using the following statistical methods:

1) Frequency and Percentage

Frequency and percentage were used to summarize students' demographic information and Generative AI usage patterns.

Percentage was calculated using:

$$P = \frac{f}{N} \times 100 \quad (1)$$

Where:

P = Percentage
f = Frequency of a response
N = Total number of respondents

2) Mean

Mean was used to calculate the average scores of the questionnaire responses and research variables.

$$\bar{x} = \frac{\sum_{i=1}^{n} x_i}{n} \quad (2)$$

Where:

$\bar{x}$ = Mean
x_i = Individual score
n = Number of observations

3) Standard Deviation

Standard deviation was used to measure how much responses are varied from the mean.

$$s = \sqrt{\frac{\sum_{i=1}^{n}(x_i - \bar{x})^2}{n-1}} \quad (3)$$

Where:

s = Sample standard deviation
x_i = Individual score
$\bar{x}$ = Mean
n = Number of observations

4) Cronbach's Alpha

Cronbachs Alpha was used to check the internal consistency of the questionnaire scales.

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k}\sigma_i^2}{\sigma_T^2}\right) \quad (4)$$

Where:
α = Cronbach's Alpha
k = Number of items
σ_i^2 = Variance of each item
σ_T^2 = Variance of the total score

5) Pearson Correlation

Pearson correlation was used to examine the relationships between Generative AI usage and perceived productivity, creativity, and independent thinking. It was also used to examine the relationship between Question 21, which measures students confidence in completing academic tasks without Generative AI and independent thinking. However, the independent thinking questions (Q18–Q20) were analysed separately when interpreting individual responses because their Cronbachs Alpha value indicated very poor internal consistency.

$$r = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}} \quad (5)$$

Where:

r = Pearson correlation coefficient
x_i and y_i = Individual scores of two variables
$\bar{x}$ and $\bar{y}$ = Means of the two variables

6) t-Test for Pearsons Correlation Coefficient

The t-test was used to determine whether the correlation between Generative AI usage and the research variables was statistically significant.

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$

Where:
t= Calculated t-value
r = Pearson correlation coefficient
n = Number of respondents
$n - 2$ = Degrees of freedom

G. Tools and Technologies

The following tools were used in the study:

- **Google Forms:** To create the questionnaire and collect responses.
- **Google Forms Response Summary**: To view response distributions and automatically generated charts.
- **Statistical Methods:** To calculate descriptive statistics, reliability, and correlations.

H. Ethical Considerations

Participation in the study was voluntary. Respondents were informed about the purpose of the research. The responses were used only for academic purposes and were treated confidentially. No personal identifying information was required for the analysis.

X. RESULTS AND ANALYSIS

A total of 118 valid responses were collected through Google Forms. The data was analysed using frequency, percentage, mean, standard deviation, Cronbachs Alpha and Pearson correlation.

A. Respondent Profile

1) Age

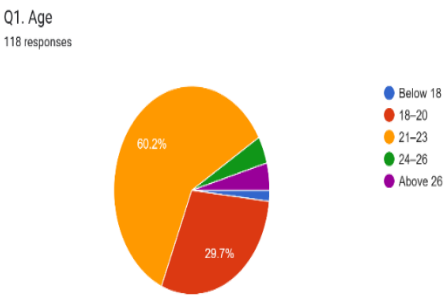


Fig. 1. Age distribution of respondents

Most respondents (60.2%) were between 21 and 23 years old, followed by students aged 18–20 (29.7%).

2) Gender

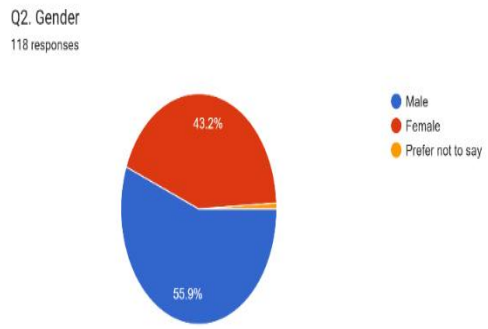


Fig. 2. Gender distribution of respondents

The sample included 55.9% male and 43.2% female respondents. The remaining 0.8% preferred not to say.

3) Level of Study

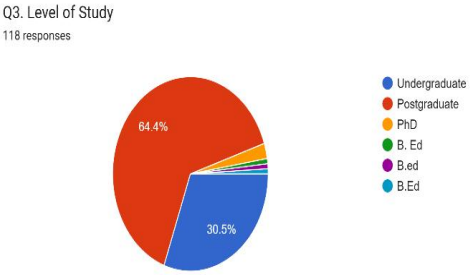


Fig. 3. Level of study of respondents

Most respondents were postgraduate students (64.4%), followed by undergraduate students (30.5%).

4) Field of Study

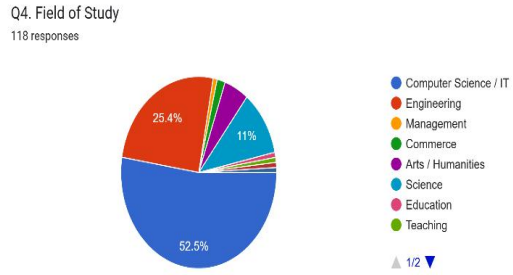
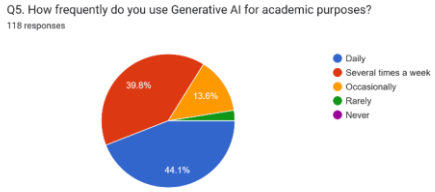


Fig. 4. Field of study of respondents

Students from Computer Science/IT formed the largest group (52.5%), followed by Engineering (25.4%) and Science (11.0%).

B. Generative AI Usage

1) Frequency of GenAI Usage



Around 44.1% of respondents used Generative AI daily, while 39.8% used it several times a week. Overall, 83.9% reported using Generative AI frequently for academic purposes.

2) Academic Uses of Generative AI

The questionnaire examined how students use Generative AI for different academic activities.

Academic Activity	Agree / Strongly Agree
Regular use of GenAI for academic work	89.0%
Understanding difficult academic concepts	87.3%
Assistance with assignments and projects	88.1%
Problem-solving, research, or coding	89.8%

The results show that most students reported using Generative AI for understanding concepts, completing assignments, and solving academic problems.

C. Individual Questionnaire Results

The questionnaire included statements related to creativity, productivity, independent thinking, and confidence without Generative AI.

The results show that students gave positive ratings to the productivity and creativity benefits of Generative AI.

Saving time received the highest mean score of 4.32. Students also reported that GenAI helps them complete academic work faster.

For independent thinking, 79.7% reported evaluating GenAI suggestions before accepting them, while 39.8% reported developing their own ideas before using GenAI. Additionally, 78% agreed or strongly agreed that they feel less confident completing some academic tasks without Generative AI.

Questionnaire Item	Mean	SD	Agree / Strongly Agree
GenAI helps generate new and creative ideas (Q10)	4.23	0.88	87.3%
GenAI helps explore different approaches (Q11)	4.26	0.96	80.5%
GenAI helps find creative solutions (Q12)	4.19	1.01	82.2%
GenAI encourages new ideas (Q13)	3.53	1.09	49.2%
GenAI helps complete academic work faster (Q14)	4.28	0.87	86.4%
GenAI helps save time (Q15)	4.32	0.88	88.1%
GenAI helps complete more tasks (Q16)	4.19	0.83	83.9%
GenAI improves overall productivity (Q17)	4.19	0.79	82.2%
I develop my own ideas before using GenAI (Q18)	3.20	1.06	39.8%
I try solving problems independently (Q19)	3.58	1.01	59.3%
I evaluate GenAI suggestions (Q20)	4.14	0.91	79.7%
I feel less confident without GenAI (Q21)	4.11	0.99	78.0%

D. Reliability Analysis

Cronbach's Alpha was used to check the reliability of the variables measured using multiple questions.

Variable	Number of Items	Cronbach's Alpha
Generative AI Usage	4	0.704
Creativity	4	0.653
Productivity	4	0.715
Independent Thinking	3	-0.021

The Generative AI Usage scale had a Cronbachs Alpha value of 0.704, and the Productivity scale had a value of 0.715. Both showed acceptable reliability. The Creativity scale had a value of 0.653 which indicates moderate reliability.

The Independent Thinking scale, which includes Q18, Q19 and Q20 had a negative Cronbachs Alpha value of -0.021 indicating very poor reliability. Therefore, these three questions were analysed separately instead of combining them into one scale. Each question examines a different behaviour developing ideas independently, trying to solve problems independently, and evaluating AI generated suggestions before accepting them.

Question 21 was analysed separately because it measures students confidence in completing academic tasks without Generative AI using only one question. The responses to this question also provide insight into students perceived reliance on AI. Students who feel less confident completing tasks without AI may rely more on AI assistance and feel less confident trusting their own abilities. However, this response alone cannot confirm that students do not use their own ideas or think independently.

D. Correlation Analysis

Pearson correlation was used to examine the relationships between the research variables. The significance level was set at 0.05.

Relationship	Pearson r	Calculated t-value	Result
GenAI Usage and Perceived Productivity	0.355	4.09	Significant
GenAI Usage and Perceived Creativity	0.128	1.39	Not significant
GenAI Usage and Perceived Independent Thinking	0.157	1.70	Not significant

1) GenAI Usage and Perceived Productivity

A positive relationship was found beteen GenAI usage and perceived productivity (r = 0.355). The t-value was 4.09 which is greater than $t_{critical}$ = 1.981. Therefore, the relationship was statistically significant. This suggests that students who reported greater GenAI usage also tended to report higher productivity.

2) GenAI Usage and Perceived Creativity

A weak positive relationship was found between GenAI usage and perceived creativity (r = 0.128). However, The t-value was 1.39 which is less than $t_{critical}$ = 1.981. Therefore, the relationship was not statistically significant. The study did not find sufficient evidence of a significant relationship between GenAI usage and perceived creativity.

3) GenAI Usage and Perceived Independent Thinking

A weak positive relationship was found between GenAI usage and perceived independent thinking (r = 0.157). However, The t-value was 1.70 which is less than $t_{critical}$ = 1.981. Therefore, the relationship was not statistically significant. This result should be interpreted cautiously because the independent-thinking scale showed very poor internal consistency, with a Cronbach's Alpha value of -0.021. The three independent-thinking questions were therefore analysed separately rather than combined into one scale.

E. Hypothesis Testing

Hypothesis testing was performed using t-test for Pearsons correlation coefficient. The significance level was set at 0.05.

The decision rule was:

If $|\mathbf{t}| > \mathbf{1.981}$, the null hypothesis was rejected, and the relationship was considered statistically significant.

If $|\mathbf{t}| \leq \mathbf{1.981}$ the null hypothesis was not rejected, and the relationship was considered statistically not significant.

The study examined relationships between variables and did not establish direct cause and effect relationships

Hypothesis	Calculated t-value	Critical t-value	Decision
H1: Generative AI usage is related to students perceived productivity.	4.09	±1.981	Accepted
H2: Generative AI usage is related to students perceived creativity.	1.39	±1.981	Rejected
H3: Generative AI usage is related to students perceived independent thinking.	1.70	±1.981	Rejected

The calculated t-values were compared with the critical t-value of ±1.981, with 116 degrees of freedom.

$H0_1$: There is no significant relationship between Generative AI usage and students perceived productivity.

The t-value was 4.09 which is greater than 1.981. Therefore, $H0_1$ was rejected. The results showed a statistically significant positive relationship between Generative AI usage and students perceived productivity.

$H0_2$: There is no significant relationship between Generative AI usage and students perceived creativity.

The t-value was 1.39 which is less than 1.981. Therefore, $H0_2$ was not rejected. The study did not find a statistically significant relationship between Generative AI usage and students perceived creativity.

$H0_3$: There is no significant relationship between Generative AI usage and students perceived independent thinking.

The t-value was 1.70, which is less than 1.981. Therefore, $H0_3$ was not rejected. The study did not find a statistically significant relationship between Generative AI usage and students perceived independent thinking. This result should be interpreted cautiously because the three questions used to measure independent thinking behaviours showed very poor internal consistency and were analysed separately.

F. Overall Interpretation

The results shows that students use Generative AI regularly with 83.9% reporting daily or several times a week usage for academic tasks. Students reported positive perceptions of productivity and creativity with mean scores of 4.24 and 4.06.

The correlation analysis found a statistically significant positive relationship between Generative AI usage and perceived productivity (r = 0.355, t = 4.09). However, no statistically significant relationships were found between Generative AI usage and perceived creativity (r = 0.128, t = 1.39) or perceived independent thinking (r = 0.157, t = 1.70). The calculated t-values were compared with the critical t-value of ±1.981 at the 0.05 significance level.

The independent-thinking questions (Q18–Q20) showed very poor internal consistency, with a Cronbachs Alpha value of -0.021. Therefore, the questions were analysed separately rather than combined into one scale. Approximately 39.9% of respondents agreed or strongly agreed that they develop their own ideas before using AI. In comparison, 59.3% reported trying to solve academic problems independently before asking AI for help, while 79.7% reported evaluating AI generated suggestions before accepting them. These findings show that students reported different behaviours when using AI for academic tasks.

Additionally, 78% of respondents reported feeling less confident completing some academic tasks without Generative AI. This may indicate that some students rely on AI assistance and feel less confident completing certain tasks using only their own abilities. However, this response alone does not establish that students avoid using their own ideas or that AI has reduced their independent thinking.

Overall, the study found a statistically significant positive relationship between Generative AI usage and perceived productivity. However, statistically significant relationships with perceived creativity and independent thinking were not found. The results describe associations and self reported behaviours and do not establish cause and effect.

XI. MAJOR FINDINGS

The major findings of the study are summarized below:

1. **GenAI Usage:** Out of 118 respondents 83.9% reported using Generative AI daily or several times a week for academic tasks.
2. **Productivity**: Productivity received an overall mean score of 4.24 indicates that students generally perceived Generative AI as useful for saving time and completing their academic work faster.
3. **Creativity:** Students reported positive perceptions of Generative AI for generating new ideas and finding creative solutions. The overall creativity mean score was 4.06.
4. **Independent Thinking:** The independent thinking questions were analysed separately because the scale had a negative Cronbachs Alpha value of -0.021, indicating very poor internal consistency. Approximately 39.9% of respondents agreed or strongly agreed that they develop their own ideas before using AI. Meanwhile 59.3% reported trying to solve academic problems independently before asking AI for help and 79.7% reported evaluating AI generated suggestions before accepting them.
   These findings suggest that students use Generative AI in different ways. The responses indicate that some students may use AI to help generate or develop ideas while many students still try to solve problems independently and evaluate AI generated responses before accepting them. Therefore, students appear to combine AI assistance with their own problem solving and evaluation rather than relying on AI in exactly the same way for every task.
5. **Confidence without AI:** Approximately 78% of respondents agreed or strongly agreed that they feel less confident completing some academic tasks without Generative AI. This suggests that many students may rely on AI assistance and feel less confident when they have to complete certain tasks using only their own abilities. This finding raises the possibility that reliance on AI may be greater for some students than their confidence in working independently. However, the result measures students reported confidence and does not directly establish that they use their own thinking less often.
6. **Correlation Results**: A statistically significant **positive relationship was found between Generative AI usage and perceived productivity (r = 0.355, t = 4.09)**. No statistically **significant relationships were found between Generative AI usage and perceived creativity (r = 0.128, t = 1.39)** or perceived independent thinking **(r = 0.157, t = 1.70).** The calculated t-values were compared with the critical t-value of ±1.981 at the 0.05 significance level
7. **Overall Finding:** Students generally felt that Generative AI helps them improve their productivity and supports their creativity. However, only the relationship between Generative AI usage and productivity was statistically significant. The responses also showed that many students try to solve academic problems on their own and check AI generated answers before accepting them. At the same time 78% of students reported feeling less confident completing their academic tasks without AI. This suggests that many students rely on AI for help and may feel less confident when working on their own. Overall, the findings show that students see benefits in using Generative AI but there may also be concerns about their confidence in completing academic tasks independently. However, the study cannot prove that using AI reduces students independent thinking.

XII. CONCLUSION

This study examined how the use of Generative AI is related to students perceived productivity, creativity, and independent thinking. A total of 118 college students participated in the survey.

The results showed that 83.9% of students used Generative AI daily or several times a week for academic work. Students generally felt that Generative AI helped them complete their work faster and supported their creativity. The average scores for productivity and creativity were 4.24 and 4.06.

The study found a significant positive relationship between Generative AI usage and perceived productivity. This means that students who used Generative AI frequently generally reported higher productivity. However, no significant relationship was found between Generative AI usage and perceived creativity or independent thinking.

The study also found that many students still try to solve problems on their own and check AI-generated answers before accepting them. However, around 78% of students reported feeling less confident completing some academic tasks without Generative AI. This shows that students may find it harder to complete certain tasks without AI assistance. The independent thinking results should be interpreted carefully because the questions used to measure it were not consistent enough to be combined into one reliable scale.

Overall, the study found that Generative AI usage was related to higher perceived productivity, but the results did not show significant relationships with creativity or independent thinking. Since the study was based on students own responses, it cannot prove that Generative AI causes changes in their abilities. Students should use Generative AI as a helpful tool while continuing to develop their own ideas, solve problems independently, and check AI generated information before using it.

XIII. LIMITATIONS OF RESEARCH

1. **Sample and Representation:** The study included 118 college students, and some academic fields and study levels may be underrepresented. Therefore, the findings may not represent all college students.
2. **Self-Reported and Perception-Based Data:** The study was based on students self-reported responses and opinions rather than direct measurements of their actual productivity, creativity or independent thinking. Confidence without Generative AI was also measured using only one question.
3. **Limited Study Period and Measurement Reliability:** The study was conducted at one point in time and does not show changes over time. Additionally, the independent-thinking questions showed poor internal consistency (Cronbachs Alpha = -0.021), so the findings related to independent thinking should be interpreted carefully.

XIV. FUTURE SCOPE OF RESEARCH

1. **Study Individual Questions:** Future research should examine the independent-thinking questions separately to better understand how students develop their own ideas, solve problems independently, and evaluate AI-generated suggestions.
2. **Conduct Practical Experiments:** Researchers should conduct experiments in which students complete academic tasks both with and without Generative AI. This can help compare their problem-solving abilities, creativity, and task completion time.
3. **Use Objective Measures:** Future studies should use practical tests and activities to measure students creativity, independent thinking, and problem-solving abilities instead of relying only on students' opinions.
4. **Study Long-Term Effects:** Future research should examine students over a longer period to understand whether regular Generative AI usage is associated with changes in their independent thinking and academic skills.
5. **Include More Students:** Future studies should collect responses from students across different colleges and academic fields to obtain a broader understanding of Generative AI usage.

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