THE IMPACT OF AI APPLICATIONS ON STUDENT LEARNING AND PERFORMANCE

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ABSTRACT:
Artificial Intelligence (AI) applications have become essential tools in modern education, significantly influencing how students learn, manage their time, and boost productivity. This study investigates the impact of AI app usage among students, with a focus on academic performance, study habits, and overall learning experiences. Based on a survey conducted among 146 students in Coimbatore, the findings reveal a widespread adoption of AI tools, with ChatGPT emerging as the most commonly used application. The results indicate that the use of AI tools has positively contributed to improved academic performance, enhanced confidence, and better time management. However, the study also highlights concerns such as over-reliance on AI, challenges in comprehending AI-generated content, and ethical implications related to academic integrity. Statistical analysis using Chi-Square tests found no significant association between students' education levels and the purposes of AI usage, nor between age groups and the challenges encountered. The study concludes by emphasizing the need for AI literacy programs, the establishment of clear ethical guidelines, and the promotion of a balanced and responsible approach to integrating AI in educational settings.

INTRODUCTION:
Artificial Intelligence (AI) is increasingly shaping various aspects of modern life, with education being one of the most significantly influenced sectors. The widespread availability of AI-powered applications has provided students with innovative tools that support learning, enhance problem-solving skills, improve time management, and stimulate creativity. From adaptive learning systems to real-time language translation and content generation tools, AI is redefining how students interact with educational material. The integration of AI into education offers substantial benefits, such as increased productivity and improved academic performance. However, it also raises important concerns. Issues such as over-dependence on AI tools, ethical considerations, and the potential decline in critical thinking and independent learning skills must be carefully examined. As AI technologies become more embedded in everyday academic life, it is vital for educators, researchers, and policymakers to understand both the opportunities and challenges they present. This study seeks to explore the impact of AI application usage among students, with a specific focus on its influence on academic performance, study habits, and overall learning experiences. By analyzing both the positive outcomes and the emerging concerns, the research aims to offer practical insights into the effective and responsible integration of AI in education to promote holistic student development.

STATEMENT OF THE PROBLEM:
The increasing use of Artificial Intelligence (AI) applications in education has significantly transformed the learning landscape for students. While these tools offer numerous benefits—such as improved academic performance, enhanced productivity, and better time management—they also introduce new challenges. Students may become overly dependent on AI for completing tasks, potentially weakening their critical thinking and problem-solving abilities. Furthermore, the ethical implications surrounding AI usage, including concerns about plagiarism, data privacy, and academic integrity, remain areas of concern.
Despite the growing presence of AI in educational settings, there is limited research on how these applications are actually influencing students' learning experiences, study habits, and academic outcomes—especially in specific regional contexts like Coimbatore. Understanding the extent of AI

adoption, the purposes for which students use these tools, and the challenges they encounter is essential to ensure that AI is integrated in a balanced and meaningful way.

This study addresses the gap by investigating the impact of AI app usage among students, examining both its positive contributions and potential drawbacks, with the aim of informing educators and policymakers about effective strategies for AI integration in education.

OBJECTIVES OF THE STUDY :

1. To determine the extent to which students utilize Artificial Intelligence (AI) applications in their academic activities.
2. To evaluate the impact of AI tools on students' academic performance, study habits, and overall learning experiences.

LITERATURE REVIEWS:

Kumar & Sharma (2020) investigated how AI-based educational applications like Duolingo, Grammarly, and ChatGPT support learning in higher education. Their findings indicated that students who regularly used these apps experienced better academic outcomes, particularly in language and writing skills. However, they cautioned that constant reliance on AI assistance may reduce students' ability to self-edit and critically evaluate their work.

Nguyen & Pham (2021) explored the role of AI in shaping study habits among undergraduate students. Their study revealed that AI tools improved consistency in study patterns through personalized reminders, adaptive learning paths, and gamification features. Nevertheless, students reported reduced initiative and a tendency to skip difficult concepts, relying on AI for simplified answers.

Ahuja & Verma (2023) focused on the student learning experience with AI-based educational tools. The study emphasized that tools like ChatGPT and Socratic significantly enhanced engagement, reduced anxiety related to complex topics, and provided instant explanations. Still, they highlighted a lack of human interaction and emotional intelligence in AI responses, which some students found limiting during in-depth learning.

Thomas & Raj (2022) conducted research on AI and academic integrity, finding that while AI tools help improve productivity and writing quality, they also raise concerns about plagiarism and ethical misuse. Their study called for institutional policies and awareness programs to educate students on responsible AI usage.

Patel & Desai (2021) analyzed the correlation between AI usage and academic performance among Indian college students. The study used statistical methods and found a positive correlation between regular use of AI apps and improved grades, especially in theoretical subjects. However, performance in practical or application-based courses showed negligible improvement, suggesting AI's limitations in hands-on learning contexts.

RESEARCH METHODOLOGY:

Research Design

This study adopts a descriptive research design, aimed at accurately and systematically describing a population, situation, or phenomenon. It involves the use of a survey to gather data related to the usage and impact of AI applications among students.

Sample Design

Sampling Technique:

The research uses convenience sampling, a non-probability sampling method where participants are selected based on their availability and willingness to take part in the study.

Population:

The target population for this study comprises individuals who actively use AI applications, specifically students.

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Sample Size:
A total of 146 respondents were selected for data collection and analysis.

METHOD OF DATA COLLECTION

Primary Data:
Primary data were collected through a structured questionnaire distributed among students to gather firsthand insights on their AI app usage and its effects.

Secondary Data:
Secondary data were obtained from various sources such as journals, websites, magazines, books, and academic articles to support and validate the research framework.

Area of the Study:
The study is conducted in Coimbatore, popularly known as "The Manchester of South India", due to its strong industrial and educational infrastructure.

LIMITATIONS OF THE STUDY

1. The use of convenience sampling may result in bias, as it may not represent the entire population accurately due to variations in individual perceptions.
2. Since the study is conducted over a short duration, it may not capture long-term trends or changing perspectives among AI app users.

DATA ANALYSIS AND INTERPRETATION:

This chapter presents the analysis and interpretation of the data collected from 140 respondents for the study titled "A Study on the Impact of AI Apps Usage Among Students." The collected data have been classified, tabulated, and analyzed using the following tools:

PERCENTAGE ANALYSIS:

Used to understand the distribution and frequency of responses for each question, providing insight into general trends and preferences.

CHI-SQUARE TEST:

Employed to test the association between categorical variables, such as the relationship between educational level and purpose of AI usage, age group and challenges faced with AI apps.

Table 1: Age

Particulars	No. of Respondents	Percentage
Below 18	**15**	**10.27%**
18 - 22	**106**	**72.60%**
23 - 27	**14**	**9.59%**
Above 27	**11**	**7.53%**
Total	**146**	**100%**

INTERPRETATION

The data shows the age category of the respondents, which **10.27%** are below 18, **72.60%** are of 18-22, **9.59%** are of 23-27, **7.53%** are of above 27. Thus, the majority of respondents age category is **18 to 22**

Table 2: Gender

Particulars	No. of Respondents	Percentage
Male	78	53.42%
Female	49	33.56%
Prefer not to say	13	8.90%
Total	**146**	**100%**

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INTERPRETATION

The data classify the genders of the respondents, which **53.42%** are of male, **33.56%** are of female and **8.90%** are grouped under prefer not say. Thus, majority of response is collected from **Male.**

Table 3: Level of Education

Particulars	No. of Respondents	Percentage
UG	103	70.55%
PG	24	16.44%
PhD	9	6.16%
Others	4	2.74%

INTERPRETATION

The data show the levels of education of total respondents, which **70.55%** are of UG, **16.44%** are of PG, **6.16%** are of Ph.D., **2.74%** are of others. Thus, the majority of respondents are **undergraduates.**

Table 4: Area of Study

Particulars	No. of Respondents	Percentage
Science	3	2.05%
Technology	11	7.53%
Engineering	48	32.88%
Arts	20	13.70%
Commerce	56	38.36%
Others	2	1.37%

INTERPRETATION

The data shows that **38.36%** of the students are commerce and **32.88%** of the students are engineering. Thus, the majority of the of the response is collected from commerce and engineering group, and with the smaller percentage group of science, technology, arts, others

Table 5: Using AI Apps

Particulars	No. of Respondents	Percentage
Yes	130	89.04%
No	10	6.85%

INTERPRETATION

The data shows that **89.04%** of total respondents says, Yes and **6.85%** of total respondents means No. Thus, the majority of respondents use the AI applications

Table 6: Frequently Using AI Apps

Particulars	No. of Respondents	Percentage
ChatGPT	106	72.60%
Grammarly	22	15.07%
Duolingo	26	17.81%
Khan Academy	13	8.90%
Others	7	4.79%

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INTERPRETATION :

The majority of respondents are uses **ChatGPT** is about **72.60%** of total respondents and the others has the least number of users like Grammarly with 15.07%, Duolingo with 17.81%, Khan academy with 8.90% and others with 4.79%. Thus, **ChatGPT** has most number of users.

Table 7: Frequency of Usage

Particulars	No. of Respondents	Percentage
Daily	33	22.60%
Weekly	57	39.04%
Occasionally	37	25.34%
Rarely	13	8.90%

INTERPRETATION:

The data shows that often usage of AI apps, 22.60% uses daily, **39.04%** uses **weekly**, 25.34% uses occasionally, 8.90% uses rarely. Thus, majority of the respondents uses AI apps for weekly basis.

Table 8: Academic Performance Improvement

Particulars	No. of Respondents	Percentage
Significantly Improved	53	36.30%
Moderately Improved	59	40.41%
No Noticeable Change	18	12.33%
Negatively Impacted	10	6.85%

INTERPRETATION

The data shows that 40.41**%** has moderately improved and **36.30%** has significally improved in the academic performance. Thus, the AI apps has moderate improvement in the academic performance.

Table 9: Clarity in Using AI Apps

Particulars	No. of Respondents	Percentage
Agree	125	85.62%
Disagree	15	10.27%

INTERPRETATION

The data shows that **85.62%** represents Yes, and **10.27%**says No for AI apps makes easier to understand the complex topics. The majority of the respondents says **Yes.**

Table 10: Improvement in Time Management

Particulars	No. of Respondents	Percentage
Improved	131	89.73%
Not Improved	9	6.16%

INTERPRETATION

The data shows that 8**9.73%** represents Yes, and **6.16%** represents No for the increase in time management by the AI apps. Thus, the majority of the respondents says **Yes**

Table 11: Confidence in Academic Work

Particulars	No. of Respondents	Percentage
Agree	113	77.40%
Disagree	27	18.49%

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INTERPRETATION:
The data shows that **77.40%** represents Yes, and **18.1%**represents No for the making more confidents in the academic works. Thus, the majority of the respondents says **Yes.**

Table 12: Duration of AI App Usage

Particulars	No. of Respondents	Percentage
Less than 1 hour	91	62.33%
1–2 hours	36	24.66%
2–4 hours	11	7.53%
More than 4 hours	2	1.37%

INTERPRETATION
The data shows that **62.33%** uses less than 1 hour, 24.66% uses 1-2 hours,7.53% uses 2-4 hours, 1.37% uses more than 4 hours. Thus, the majority of respondents uses **less than 1 hours.**

Table 13: Relying on AI for Assignments

Particulars	No. of Respondents	Percentage
Yes, frequently	60	41.10%
Occasionally	58	39.73%
Rarely	19	13.01%
Never	2	1.37%

INTERPRETATION
The above data shows the respondents on rely on AI apps for assignments. Which **41.10%** are of frequently rely, **39.73%** are of occasionally, **13.01%** are of rarely and **1.37%** are of never. Thus, the maximum respondents are **frequently** and **occasionally** rely on AI apps.

Table 14: Challenges of Using AI Apps

Particulars	No. of Respondents	Percentage
Inaccurate or Unreliable Information	29	19.86%
Difficulty Understanding Outputs	57	39.04%
Ethical Concerns	32	21.92%
Over-Reliance on AI Tools	15	10.27%
Others	7	4.79%

INTERPRETATION
The data shows the challenges of using AI apps, which **39.04%** are of Difficulty understanding outputs, **19.86%** are of inaccurate or unreliable information, **21.29%** are of Ethical concerns, **10.27%** are of others reliance on AI tools and **4.79%** are of Others. Thus, the majority of respondents faces the challenge of **Difficulty understanding outputs.**

Table 15: Concern of Data Privacy

Particulars	No. of Respondents	Percentage
Yes	121	82.88%
No	19	13.01%

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INTERPRETATION

The data shows the concern of data privacy while using AI apps, which **82.88%** are says Yes, **13.01%** are says No. Thus, the majority of respondents says **Yes** for the concern of data privacy

Table 16: Level of Education and Purpose of Using AI Apps

Level of Education	Writing & Editing Assignment	Learning New Topics	Solving Academic Problems	Organizing Academic Tasks	Other	Total
Undergraduate	28	40	24	15	1	108
Postgraduate	3	12	6	4	0	25
PhD	1	1	3	4	0	9
Other	1	1	2	0	0	4
Total	33	54	35	23	1	146

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	13.274[a]	12	0.349
Likelihood Ratio	13.119	12	0.362
Linear-by-Linear Association	3.217	1	0.073
N of Valid Cases	146		

Interpretations

The p-value of 0.349, which is greater than 0.05. This indicates that there is no significant association between Level of Education and Purpose of Using AI Apps at the 5% significance level.

Table 17: Age group and Challenges while using AI apps

Age Group	Inaccurate or Unreliable Info	Difficulty Understanding Outputs	Ethical Concerns	Over-Reliance on AI Tools	Other	Total
Below 18	4	2	4	4	2	16
18–22	23	48	24	11	5	111
23–27	1	9	4	1	1	16
Above 27	1	3	1	0	0	5
Total	29	62	33	16	8	146

Interpretations

The p-value is 0.069 which is greater than 0.05, the result is not significant. There is no significant association between a respondent's age group and the type of challenges they face while using AI applications.

FINDINGS:

Demographic Profile:

1. The majority of respondents (72.60%) are aged 18–22, indicating that most participants are undergraduate-level students within typical college-going age.
2. A higher proportion of respondents were male (53.42%), followed by females (33.56%) and 8.90% preferring not to disclose.
3. 70.55% of the respondents are pursuing undergraduate studies, followed by postgraduates (16.44%), PhD scholars (6.16%), and others (2.74%).

4. The majority of students belong to Commerce (38.36%) and Engineering (32.88%), followed by Arts, Technology, and Science.
5. A significant 89.04% of the respondents confirmed using AI apps, demonstrating widespread adoption among students.
6. ChatGPT (72.60%) emerged as the most frequently used app, followed by Duolingo, Grammarly, and Khan Academy.
7. Most students use AI apps on a weekly basis (39.04%), followed by occasional (25.34%) and daily use (22.60%).
8. 62.33% of students use AI apps for less than 1 hour per day, indicating brief but consistent usage.
9. 9.Academic Improvement:40.41% reported moderate improvement,36.30% saw significant improvement, very few experienced negative impacts (6.85%).
10. 85.62% of respondents agreed that AI apps help them understand complex topics better.
11. 89.73% of students felt that AI apps helped them improve time management.
12. 77.40% said AI apps increased their confidence in academic tasks.
13. 41.10% rely on AI apps frequently,39.73% rely on them occasionally.
14. 39.04% face difficulty understanding outputs, 21.92% have ethical concerns, 19.86% report inaccuracy in AI responses.
15. A large number of students (82.88%) expressed concerns over data privacy, indicating the need for secure and transparent AI platforms.

Chi-Square Test:

16.No significant association was found between the level of education and the purpose of using AI apps.

17.No significant association was found between the respondent's age and the type of challenges they face with AI apps.

SUGGESTION:

To enhance the responsible and effective use of AI in education, it is important to encourage developers to improve AI explanations by offering simplified, step-by-step responses that are easier for students to understand. Alongside this, promoting AI literacy training can equip students with the skills needed to interpret and apply AI-generated content effectively. Educators should also emphasize the importance of fact-checking and critical evaluation of AI outputs, and encourage students to use AI tools in combination with trusted academic sources. Establishing clear guidelines for ethical AI use is essential, as is educating students on the risks of plagiarism and promoting responsible AI-assisted learning. A balanced approach that integrates AI with traditional study methods should be encouraged, and assignments should be designed to promote critical thinking that goes beyond what AI can provide. Additionally, raising awareness about AI applications' data privacy policies is crucial. Students should be informed of potential privacy risks and encouraged to use applications that offer strong data protection. These strategies collectively support a more informed, ethical, and productive use of AI in academic settings.

CONCLUSION :

This study provides valuable insights into the impact of AI applications on students, highlighting both their advantages and challenges. The findings indicate that AI tools significantly contribute to improved academic performance, time management, and confidence in academic work. However, concerns such as over-reliance, difficulty in understanding outputs, and data privacy issues remain critical considerations. The research results suggest that while AI applications are widely used and beneficial, there is a need for structured guidance in their implementation within educational environments. A balanced approach that integrates AI's strengths while maintaining traditional

learning values can enhance student learning experiences without compromising cognitive development and ethical integrity. Ultimately, AI applications serve as powerful educational aids, but their effectiveness depends on how they are utilized. Ensuring responsible usage, enhancing AI literacy, and addressing challenges will help maximize their positive impact on students' academic journeys.

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