

A Thematic Analysis of AI's Double-Edged Role in Students' Academic Journey.**Dr. Garima Sharma¹, Md. Chand Ansari²**

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Abstract

The advent of AI has revolutionized a lot of aspects in the education sector. The author presents the impacts on students in this paper due to the use of AI and AI-related technologies. This paper has unveiled the pros and cons of adopting this technology by college students. Convergent parallel mixed methods were used as the basis of quantitative and qualitative data collection in 60 universities in Delhi. The survey had questions of different types, Likert scale questions and demographic questions regarding the benefits, limitations and ethical issues that AI could present. This paper highlights the increasing student addiction to such AI applications and restrictions on utilization of these applications in schools. It touches upon the characteristics and merits and demerits of AI and other human instructors..

Keywords: Educational Technology, Artificial Intelligence, Adaptive Learning Environment, Human-AI Collaboration, Ethics in Educational AI

Introduction

Artificial Intelligence or, to be more precise, AI Technologies have been the major contributing force to the evolution of the education system, which has changed over a century in a very remarkable manner.

The innovation is the one that is normally used in the field of academics, whether in schools or in Universities [1]. AI plays a role in transforming the system of education concerning the new approaches to teaching, planning the curriculum, and students participating in different fields of study.[2] This digital tool not only helps by providing solutions to different questions that students have but also aids in providing constructive feedback, structure analysis, personalized programs, and provides student-focused responses.[3]

People nowadays are technology focused. The classic old school method of teaching cannot keep up with today's technology. [4] AI uses machine learning algorithms and real-time data for content personalization.[5]

It is also changing the methods of assessment and evaluation along with the content distribution [8]. Automated scoring system, quick quizzes, and virtual assistant aid in self-evaluation [9]. These tools help increase efficiency, decision-making, and understanding performance.

Every coin has two faces. Everything in this world has its pros and cons. Once science fiction, AI, which has helped people in their day-to-day life, has its own disadvantages. Today, AI has raised significant ethical conflicts among people [15]. Various matters such as data privacy, algorithmic bias, surveillance, and emotional disconnect raise a question of concern and demand for a responsible AI system [16].

AI was made for assisting humans rather than replacing them. Researchers should focus on making it a friendly device, and the central focus should be a better learning experience, along with empathy, critical thinking, and creativity.

Review of Literature

The integration of Artificial Intelligence (AI) into higher education has absolutely changed the design, planning, assessment, and institutional governance [22], [23]. Scholars such as [25] and [26] focus on the idea that AI-driven adaptive mechanisms and hybrid recommender algorithms have constructed self-directed learning environments by modulating the content and feedback as per individual student needs. As a result of this, enhanced confidence, motivation, and overcoming deadlines have become quick. [27] and [28] further report that such human interactive and friendly platforms have improved satisfaction and capability, specifically in online and STEM education. In the domain of assessment, [30] and [31] stated that machine-controlled scoring and quizzes produce instant, data-informed feedback, while [32] affirms the idea that dynamic language models like ChatGPT have aligned student results, maintaining the standardized rubrics. [33] throws light on sentiment-aware AI tools that enable identifying the students so that timely pedagogical support can be provided. For organizational analytics, [35] and [36] open the fact that predictive AI dashboards have helped in identifying at-risk learners and

raising retention rates. On inclusion, [40], [41], and [42] have accepted the notion that AI's role in assisting students with disabilities and bridging rural gaps has been noted as significantly crucial, resulting in a sense of belongingness. Ethically, [43], [45], and [46] warned against data bias and loss of individual empathy, demanding responsible incorporation of AI, supported by governance initiatives.

Hypothesis

Null Hypothesis (H_0):

Artificial Intelligence (AI) tools do not have a statistically significant impact on the academic performance of students [48],[49]. AI mainly functions as a complementary tool rather than a direct fuel of success [48].

IV. Research Methodology

The study follows up a convergent mixed method approach to extrapolate the consumption of AI tools, significantly ChatGPT, on students' academic performance, engagement, quality of assessment and ethical perceptions [50], [51]. A web-based survey collected both quantitative (Likert-scale and demographic items) and qualitative (open-ended) data [54]–[58]. Quantitative data were analyzed using descriptive statistics and inferential tests (Chi-Square, Spearman's Correlation, Mann–Whitney U) in SPSS v28, with $p < 0.05$ as the significance threshold (Table I) [50]–[56]. Qualitative responses were subjected to two-cycle thematic coding (open and axial), and this gave birth to five themes, namely, personalization and adaptability, human-like interaction and emotional support, accuracy and reliability, curriculum integration, and ethical concerns [57]–[61]. The interpretation process involved quantitative and qualitative results to attain the general picture of the student-AI interactions [62]. The sample included undergraduate and postgraduate students, which is why students of Delhi who are recruited in institutional mailing lists by means of purposive sampling were included [59], [60], [61]. Some of the ethical practices that were followed included voluntary participation, informed consent, confidentiality, and withdrawal of choice. The use of AI, data privacy, academic integrity, and bias on the algorithm were also subjects of ethical issues in survey design and analysis [48],[63].

Statistical Tests and Objectives

Test	Variables Compared	Objective
Chi-Square	AI Usage $\times$ Academic Performance	Test the association between categorical variables [64]
Spearman Correlation	AI Usage $\times$ Engagement	Assess monotonic relationship [65]
Mann–Whitney U	Gender $\times$ Performance Perception	Compare two independent ordinal groups [66]

Result

The three parts give the findings of the mixed-method research as follows:

Descriptive Analysis of Student Demographics and AI Usage

The final data sample has 60 valid responses. The form can be said to be diffused and the responses to it on the following link:[60].

Respondent Profile

This is the final dataset and consists of 60 valid responses. Most of the interviewees (53.3% women and 91.7% older than 19 years old). The students were of varied academic programs, with majority of them being of undergraduate level around humanities, communication and technology related courses. Table II demonstrates the demographic characteristics of the respondents.

Demography Profile of Respondents

Attribute	Category	Percentage (%)
Gender	Female	53.3[86]
	Male	46.7[86]
Age	19 years and above	91.7[87]

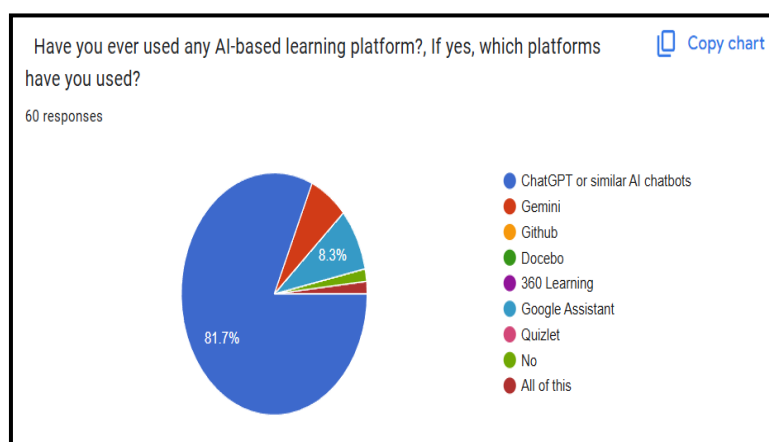
AI Usage Frequency and Tool Preference

The academic practices of students have been penetrated by AI technologies. As Table III shows, 66.6 percent of the participants responded that they used AI-based solutions, such as ChatGPT, at least twice or three times a week or more frequently, which implies that they are attending to these solutions every single day and have to get some support in learning. This descriptive tendency gives a platform on which inferential testing in future would be based.

AI tool usage frequency

Usage Frequency	Percentage (%)
2–3 times a week or more	66.6 [91]

Conversational AI tools such as ChatGPT were identified as dominating when presented with the question of how they liked using their platform, with 81.7% of students indicating that they used them. Google Assistant and Quizlet were also mentioned, but their occurrence was considerably less, which could also point to the possibility of a student having more predispositions to multifunctional and conversational interfaces. The most popular AI learning platform was chatbots as Figure 1 illustrates.



Depicts that chatbots are the most popular AI learning platform

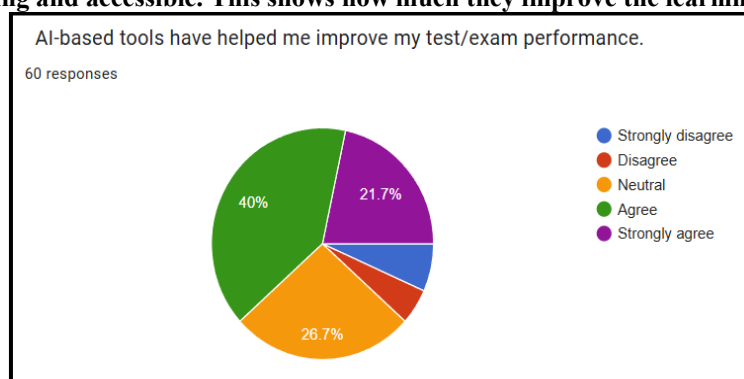
Positive Impact on Performance

A large majority of students (61.7%) agree or strongly agree that AI technologies have helped them do better on tests and exams (Table IV). This descriptive result is statistically supported by the Chi-Square Test ($\chi^2 = 6.23$, $p = 0.034$), which confirms a significant association between higher AI usage frequency and perceived academic benefits.

Perceived Academic Performance

Statement	Agree/Strongly Agree (%)
AI tools improved test/exam performance	61.7[96]
AI tools made learning more engaging and accessible	58.3[98]
Teachers integrate or encourage AI tool usage	35.0[99]
AI can replace teachers in the future	16.7 (Yes) / 33.3 (Maybe) / 50.0 (No) [100]

Fig 2 shows that a large majority (58.3%) agree or strongly agree that AI tools make learning more interesting and accessible. This shows how much they improve the learning process.



Graph Showing Academic Performance More Engagement and Accessibility

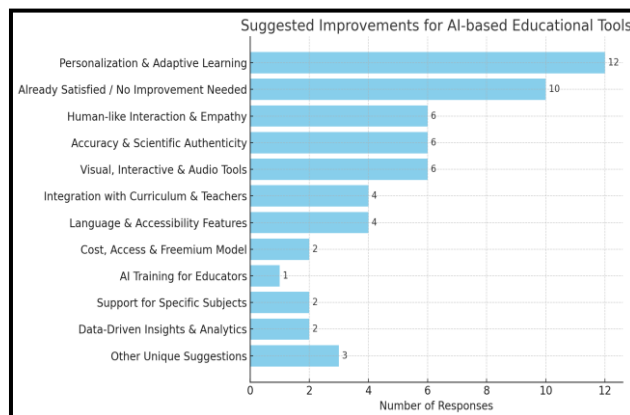
Teacher Integration Gap

Figure 2 states that students utilize AI a lot, but teachers don't always support or employ it in their lessons. Only 35% of students agree or strongly agree that their professors use AI, while a large number (33.3%) are neutral and 31.6% disagree.

AI as a Complement, Not a Replacement for Teachers

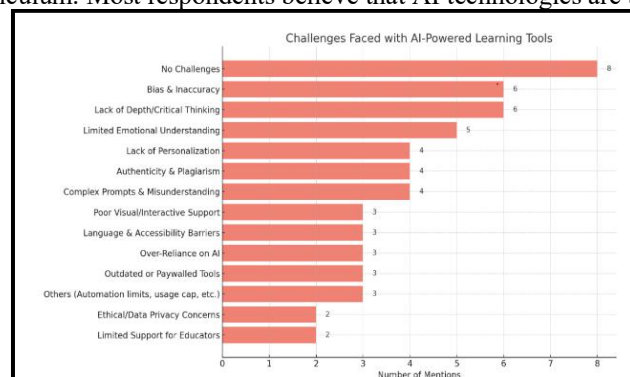
A large majority of respondents as mentioned in Table IV, about 50% believe AI cannot replace teachers in the future, with an additional 33.3% being doubtful ("Maybe"). Only a tiny number of people (16.7%) think that AI will completely replace teachers. This shows that people still think the human part of education is important, even though they see AI as a useful tool for learning.

Based on the data from your poll, below is figure 3 that shows how the suggested improvements for AI-based instructional tools are spread out.



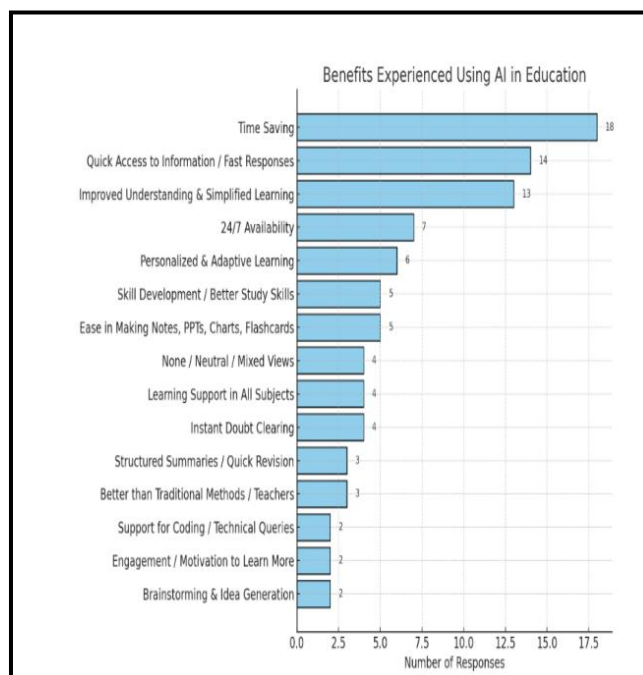
Graph Showing Suggested Improvements for AI-based Educational Tools

The area that needs the most work is personalization and adaptive learning. Many respondents are already satisfied, which indicates a positive view. People increasingly seek human-like connections, accuracy, and visual or interactive support. Some concerns include the cost, the authenticity of the content, and how well it integrates with teachers and the curriculum. Most respondents believe that AI technologies are beneficial for education.



Graph shows challenges faced with AI-Powered learning tools

Figure 5 shows how AI helped people in education. Personalized learning and adaptive responses increased interest in learning and provided more options for when to study. Several people noted that AI assistance improved their projects, presentations, and summaries. Some users felt more independent and curious, relying less on their teachers.



Graph showing the benefits experienced using AI in Education
Inferential Statistical Analysis

In order to test the relations of the frequency of AI use, educational performance, three statistical tests were used, and they included Chi-square, spearman rank correlation, and Mann Whitney U A Chi-square test was used to prove that the frequency of AI use is significantly related to the perceived academic improvement by an individual ($\chi^2 (2-N) = 6.23, p = 0.034$) that is, the higher the frequency of AI use, the higher the perceived academic improvement experienced by a person. The evidence of moderate positive correlation between the use of AI and engagement ($0.42, 0.012$) was supported by Spearman correlation which shows the application of AI is positively correlated to the engagement of students. The MannWhitney U test results revealed that no significant gender differences in the perceived impact on academics ($U = 390.5, p = 0.148$) that represented gender-neutral benefits were found (Table V). The rates were also very high among students, and only 35 percent of students were aware that the AI is actively used by their instructor, and it indicated a pedagogy gap, which triggered the concern of ethical application, guidance, and curriculum congruency. Speaking of the role of AI compared to that of the human educator, 50 percent of the students stated that AI will never replace the human educator, 33.3 percent of the students stated that AI will never replace, but probably and 16.7 percent stated that AI can replace.

Test	Variables Compared	Result	Significance
Chi-Square	AI Usage $\times$ Academic Performance	$\chi^2 = 6.23, p = 0.034$	Significant [130]
Spearman	AI Usage $\times$ Engagement	$\rho = 0.42, p = 0.012$	Significant [134]
Mann–Whitney U	Gender $\times$ Academic Impact	$U = 390.5, p = 0.148$	Not Significant [137]

Qualitative Insights: Thematic Analysis

The question survey of the percentage of students who reported that teachers actively used AI during classes was 35 percent with 33.3 percent of the students indicating the neutrality and the rest 31.6 percent of students indicating that it has not been adopted by the teachers which is an indicator of teacher-integration/high-student-integration disconnect. The answers to the question of AI substituting educators were 50 No, 33.3 May, 16.7 Yes, which can be translated into the impression concerning the inability to replace the functions of empathy, contextual judgment and mentorship by AI, but AI can become an assistant. The proposed improvements consisted of increased

personalization, which is closer to being more human and includes more visual or interactive data, and it coincides with the positive correlation between the use of AI and participation (0.42, $p = 0.012$). The advantages that were cited were 24/7 access, better comprehension on hard material, timesaving, and the disadvantages of this were excessive dependency, lack of accuracy, loss of emotion, and plagiarism. These findings support the above-mentioned authors in the ethical and pedagogical way of their conclusion over the use of AI in higher education.

Limitations of Study

The following are the weaknesses that were identified. It is a subjective bit of information and does not correlate the accomplishments of education to objective marking. It was quite limited ($n = 60$) and was targeted on certain groups of students, and, thus, it could not be generalized to other institutions, cultures, and disciplines. The purposive sampling could have provided some biased results as much as students are comfortable with AI. The study design does not suggest any causal assumption since it is cross-sectional, and the views of the teacher, administrator, and developer were not mentioned in the study. Irrespective of these minor flaws, the results provide a rough preview of the interactions between the students and AI and reveal the research directions of the future.

Conclusion

The paper demonstrates the significance and the place of AI on college and school students. The use of ChatGPT, perplexity, Google Gemini, and Google Assistant is used by educators daily. Such applications can assist them to better their performance, measure their progress, and furnish them with the techniques of effective studying and cognition. Nevertheless, AI technologies are not the only solution for educators, teachers, students, and institutions. Instead, it is intended to be considered as the motivator that enhances performance. Emotional separation is difficult to overcome with the help of AI that a human being has..

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