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Impact of ChatGPT and AI Tools on Learning Patterns among Technical Students

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Abstract- ***Mention The integration of Artificial Intelligence (AI) tools into education has reshaped traditional learning methods, particularly among technical students who frequently engage in problem-solving, programming, and research-based activities. Tools such as ChatGPT, GitHub Copilot, Grammarly, and Quillbot are increasingly used for academic purposes including coding assistance, assignment completion, concept clarification, and research writing. This study investigates the impact of AI tools on the learning patterns of technical students, focusing on their influence on study habits, problem-solving skills, critical thinking, and overall academic outcomes. A survey-based research design was employed to collect data from technical students across different academic levels and disciplines. The questionnaire covered areas such as awareness, frequency of use, perceived benefits, challenges, and future outlook of AI in education. The findings reveal that while AI tools enhance accessibility, efficiency, and conceptual understanding, they also raise concerns regarding over-dependence, originality, and ethical issues such as plagiarism. The study concludes that AI tools have both positive and negative implications for technical education. They act as valuable learning aids when used responsibly but may undermine independent thinking and creativity if over-relied upon. The results provide insights for educators, institutions, and policymakers to develop guidelines for the responsible integration of AI into academic settings, ensuring that these technologies complement rather than replace traditional learning methods.***

Keywords: Artificial Intelligence (AI), ChatGPT, Learning Pattern, Technical Students, Problem-solving, Education, Academic; Study.

I. INTRODUCTION

This The rapid advancement of Artificial Intelligence (AI) has significantly transformed various aspects of modern life, including education. In recent years, AI-powered tools such as ChatGPT, GitHub Copilot, Grammarly, and Quill bot have gained widespread adoption among students, particularly in technical domains such as engineering, computer science, and data science. These tools offer instant access to information, assist in programming, enhance writing quality, and provide personalized learning support, thereby reshaping how students approach academic tasks.

Technical students, who often deal with complex problem-solving, programming, and research-based learning, are among the primary users of AI tools. The integration of AI into their learning environment has the potential to enhance efficiency, foster self-directed learning, and support innovative thinking. At the same time, concerns arise regarding over-reliance on these technologies, the risk of reduced critical thinking, and ethical implications such as plagiarism and academic dishonesty.

Understanding how AI tools influence learning patterns is crucial for students. By examining both the benefits and challenges, this research aims to evaluate the extent to which AI impacts study habits, problem-solving abilities, and overall learning outcomes among technical students. The findings will contribute to ongoing discussions about integrating

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AI responsibly into education while ensuring that it complements rather than replaces traditional methods of teaching and learning

II. IDENTIFY, RESEARCH AND COLLECT IDEA

The process of identifying and refining a research idea is a crucial preliminary step in developing a well-structured and meaningful research study. For the present research on the Impact of ChatGPT and AI Tools on Learning Patterns among Technical Students, a systematic approach was adopted to explore the topic's relevance, feasibility, and academic value. This involved multiple stages of idea generation, evaluation, and validation, as described below:

1. Review of Existing Literature

A comprehensive review of previously published research was conducted to understand current academic perspectives on AI tools used in education. Studies related to AI-assisted learning, student engagement, digital literacy, and the effects of generative AI on academic performance were analyzed. This literature review helped identify knowledge gaps and established a strong conceptual foundation for the present study.

2. Online Search and Exploration

Extensive online research was carried out using trusted academic databases, scholarly websites, educational forums, and research platforms. Searches focused on understanding the evolution, applications, and limitations of tools such as ChatGPT, GitHub Copilot, Grammarly, and Quillbot. This step ensured access to up-to-date information and global perspectives that inform the relevance of the topic.

3. Academic Events and Expert Interactions

Insights were also gathered through participation in or review of academic events such as conferences, workshops, and seminars on Artificial Intelligence, digital learning technologies, and educational innovation. These platforms provided exposure to expert viewpoints, emerging trends, real-world classroom implementations, and discussions on ethical concerns surrounding AI integration in education.

4. Understanding Scientific Concepts and Terminology

To enhance academic accuracy and conceptual clarity, relevant technical terms and scientific concepts were studied in depth. These included AI-related terminologies such as natural language processing (NLP), machine learning, generative models, algorithmic bias, and academic integrity issues. Familiarity with this terminology ensured precise articulation of the research problem and improved the scientific rigor of the study.

III. WRITE DOWN YOUR STUDIES AND FINDINGS

This chapter presents the major findings derived from the analysis of the collected data. Statistical tools such as frequency distribution, percentage analysis, and graphical interpretation were used to examine the responses of the participants. The findings summarize the results obtained from all tables, charts, and survey items included in the study. The key findings of the research are as follows:

1.High Awareness: Almost all respondents were aware of at least one Artificial Intelligence (AI) tool, with ChatGPT identified as the most widely recognized platform among technical students.

2.Frequent Usage: A significant majority of students reported using AI tools on a daily or weekly basis for academic purposes, indicating strong adoption of AI-assisted learning.

3.Primary Usage Purpose: Students predominantly used AI tools for completing assignments, clarifying concepts, and receiving assistance with programming-related tasks.

4.Enhanced Learning Efficiency: Respondents indicated that AI tools helped them complete academic tasks more quickly and efficiently.

5.Improved Conceptual Understanding: Tools like ChatGPT were found to simplify complex technical concepts, making learning more accessible for students.

6.Improvement in Writing Skills: Grammarly and Quillbot contributed to enhanced writing quality, grammar accuracy, and better sentence structuring.

7.Coding and Debugging Support: GitHub Copilot and ChatGPT provided valuable assistance in generating code and identifying errors during programming exercises.

8.Positive Perception of AI: Most students expressed a favorable attitude toward the integration of AI tools in their learning processes.

9.Risk of Over-dependence: A portion of respondents admitted becoming overly dependent on AI for generating solutions and completing assignments.

10.Reduced Critical Thinking: Some students reported a decline in independent reasoning and critical thinking due to frequent reliance on AI-generated outputs.

11.Concerns About Originality: A few respondents observed that their creativity and originality had decreased when using AI tools extensively.

12.Ethical Issues Identified: Instances of unintentional plagiarism and misuse of AI-generated content were noted among the respondents.

13.Doubts About Information Accuracy: Several students expressed concerns regarding the reliability and accuracy of AI-generated responses.

14.Absence of Institutional Guidelines: Many students reported that their educational institutions had not yet established formal policies or guidelines for the ethical use of AI tools.

15.Boost in Confidence: AI tools helped students build confidence in technical subjects by providing immediate explanations and solutions.

16.Encouragement of Collaborative Learning: AI use facilitated group discussions and collaborative learning, as students often shared AI-generated insights with peers.

17.Better Time Management: Many respondents acknowledged improved time management due to AI tools automating various repetitive academic tasks.

18.Enhancement of Digital Skills: Exposure to AI tools contributed to better digital literacy, adaptability, and technological proficiency among technical students.

19.Awareness Gap: A small proportion of students remained unaware of advanced AI tools and applications beyond commonly used platforms like ChatGPT.

IV. REASEARCH METHODOLOGY

The present study follows a survey-based descriptive research design. This design was chosen because it helps in collecting factual information and opinions from respondents to describe and analyze the Impact of ChatGPT and AI Tools on Learning Patterns among Technical Students. Data were collected through a structured questionnaire distributed among technical students studying in various disciplines such as Computer Applications, Information Technology, and Engineering. The survey method enabled the collection of quantitative data efficiently from a large number of respondents.

1.Data Collection Procedure

The data collection process was carried out through an online survey using Google Forms. The questionnaire link was shared with MCA and Engineering students of Zeal Institute via class groups.

Respondents were informed about the purpose of the study, and consent was obtained before participation. They were assured that their responses would remain confidential and used purely for academic purposes.

The survey remained open for one week to allow sufficient time for responses. After completion, all data were downloaded in Microsoft Excel format for organization and analysis.

2.Data Analysis Technique

The data collected from the respondents were organized, coded, and analyzed using descriptive

statistical methods. The analysis focused on summarizing responses to identify patterns, trends, and relationships. The following methods were applied:

3.Frequency and Percentage Analysis – To describe the distribution of responses.
Graphical Representation – Using bar graphs, pie charts, and column charts to visually present findings.

4.Tools and Techniques Used
To analyze and present the data effectively, the following tools and techniques were employed:
Microsoft Excel – Used for data tabulation, calculation of frequencies, and creation of charts and graphs.
Percentage Method – Applied to interpret the proportion of respondents for each response category.

5.Descriptive Statistics – To describe overall trends, such as levels of awareness, usage, and perceived impact.

6.Graphical Tools – Bar graphs, pie charts, and column charts were used to visually illustrate the results.
These tools and techniques provided clear, systematic, and reliable insights into how AI tools influence learning patterns among technical students.

CONCLUSION

The findings of this study highlight that AI tools significantly influence the learning environment of technical students by enhancing accessibility, simplifying complex concepts, and providing efficient support for academic tasks such as coding and writing. AI-powered platforms promote self-paced learning and improve students' confidence in understanding technical subjects. However, these benefits also emphasize the need for educators to adapt their teaching methods to ensure that AI remains a supportive tool rather than a substitute for conventional learning approaches. Proper integration of AI into academic processes can help students develop both digital literacy and subject-related competence in a balanced manner.

At the same time, the study also brings attention to challenges associated with the excessive use of AI tools. Issues such as over-dependence, reduced critical thinking, plagiarism risks, and uncertainty regarding the accuracy of AI-generated responses highlight the importance of fostering responsible and ethical AI usage. To address these concerns, institutions must implement clear guidelines, promote awareness about academic integrity, and provide structured AI literacy training. Overall, the research concludes that while AI tools hold immense potential to transform technical education, their effectiveness relies heavily on proper guidance, ethical practices, and balanced usage to ensure that essential human skills like creativity, reasoning, and independent problem-solving are preserved..

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