Impact of Artificial Intelligence Tools on Students' Learning and Study Practices

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Abstract: *Artificial Intelligence (AI) tools have become an inseparable part of students' academic and learning lifestyle, providing support in areas such as doubt clarification, time management, content summarization, and academic planning. While AI-based tools provide convenience and efficiency, concerns have emerged regarding their influence on conceptual understanding, independent thinking, and long-term learning retention. This study aims to evaluate the role of AI tools in education from the perspective of students, focusing on both their advantages and limitations. The research adopts a mixed-method approach, combining a literature review with a primary survey conducted among students across different academic levels. The survey findings indicate that while a majority of students use AI tools frequently for academic assistance and acknowledge their usefulness in saving time and improving productivity, many also recognize that excessive reliance on AI can lead to surface-level learning and reduced critical thinking. The results suggest that students perceive AI as a supportive tool rather than a complete replacement for traditional learning methods. The study determines that AI tools should be used selectively and responsibly, primarily as aids for planning, revision, and clarification, while core conceptual learning should continue to be guided by teachers, textbooks, and self-effort. A balanced integration of AI in education is crucial to ensure effective learning without compromising foundational understanding.*

Keywords: Artificial Intelligence in Education, Student Learning, Educational Technology, Conceptual Understanding, Independent Learning

1. Introduction

The rapid advancement of Artificial Intelligence (AI) has significantly influenced various sectors, including education. AI-powered tools such as intelligent chatbots, virtual assistants, and automated learning platforms are increasingly adopted by students to upkeep academic activities. These tools offer quick access to information, assistance in problem-solving, personalized study suggestions, and efficient time management, making them appealing to learners across different academic levels.

In recent years, the integration of AI into education has been accelerated by the growing demand for digital learning solutions. Students now rely on AI tools for tasks such as understanding difficult concepts, summarizing study notes, planning academic schedules, and preparing for examinations. The flexibility and accessibility of AI-based tools allow learners to pursue academic assistance anytime and anywhere, minimising dependency on traditional classroom learning. As a result, AI has been widely perceived as a powerful enabler of self-directed and technology-assisted learning.

However, alongside these benefits, concerns have emerged regarding the application of AI in education. A major concern is that AI often provides shortcuts, summarized explanations, or pattern-based solutions, which may encourage memorization and rote learning rather than deep conceptual understanding. When students excessively lean towards AI-generated responses, they engage less in critical thinking, problem analysis, and independent reasoning. This raises questions about whether AI-supported learning promotes genuine understanding or simply enables quick task completion.

Another important issue is the impact of AI on foundational learning. Core concepts in subjects such as mathematics, science, and language require gradual understanding, practice, and cognitive involvement. While AI tools can assist in clearing doubts or revising topics, replacing traditional learning methods with AI-based explanations may weaken long-term retention and conceptual clarity. Education is not limited to acquiring information, it also involves developing analytical skills, discipline, and logical freedom, which cannot be fully achieved through automated applications.

Therefore, it becomes essential to examine how AI tools are currently being used by students and how they are perceived in terms of effectiveness and limitations. This study explores students' usage patterns, opinions, and experiences with AI tools in academic contexts. The research highlights the need for a balanced approach, where AI is used to support rather than replace core learning processes. Understanding this balance is crucial to ensure that AI contributes positively to education without undermining the fundamental aims of learning.

2. Literature Review

The rapid advancement of Artificial Intelligence (AI) has significantly influenced the education sector, reshaping how teaching and learning processes are designed and incorporated. Existing literature extensively discusses AI as a technical tool that enhances efficiency, accessibility, and personalised schedules in education. AI-based systems are progressively integrated into classes and digital learning environments to support instructional delivery, assessment, and student engagement.

Several studies highlight the role of AI in assisting teachers by automating administrative and tedious tasks such as grading, attendance management, and progress tracking. This

enables educators to devote more time to instructional planning and student interaction. From this perspective, AI is viewed as a supportive tool that complements teaching rather than replacing educators.

In relation to students, existing research emphasizes AI's usefulness in providing personalized learning experiences. Adaptive learning systems adjust content based on students' pace, performance, and preferences, which have been associated with improved engagement and flexibility. Studies also note that AI tools support students by offering instant feedback, summarizing academic content, and recommending learning resources, thereby helping manage academic load.

The introduction of generative AI tools such as ChatGPT has further prolonged academic discussion. Research suggests that students increasingly rely on such tools for doubt clarification, idea generation, content summarization, and assignment assistance. Many studies report positive outcomes such as increased efficiency and reduced academic stress. However, scholars also acknowledge that the usefulness of AI is subjective and largely dependent on how it is used.

Alongside benefits, studies highlight several concerns related to AI integration in education. Ethical issues such as plagiarism, academic dishonesty, and over-dependency on AI-generated content are frequently discussed. Researchers caution that excessive reliance on AI may reduce originality and independent thinking. Additionally, concerns data privacy, unequal access to technology, and algorithmic bias are noted, specifically in developing educational outlines.

Another limitation discussed in existing studies is the potential reduction of human interaction in learning environments. Over-dependence on AI-mediated instruction may limit collaborative learning and student–teacher engagement. While many scholars argue that AI cannot replace teachers due to the lack of emotional intelligence, this argument often remains focused on emotional and ethical aspects rather than cognitive learning processes.

Most existing studies adopt a descriptive, tool-based approach, focusing on what AI can do and how it is implemented. While this provides insight into efficiency and functionality, it offers limited examination of how AI affects conceptual learning. AI tools often present information in condensed forms, shortcuts, or solution-oriented patterns. Although useful for revision and quick clarification, such approaches may encourage surface-level learning rather than deep conceptual understanding.

Furthermore, limited attention is given to distinguishing between AI as a learning support tool and AI as a replacement for foundational learning. The long-term impact of relying on AI-generated explanations for core understanding remains underexplored. This indicates a need for more focused analysis on how AI can be used strategically without compromising the essence of learning.

Research Gap:

Although existing research widely discusses the advantages and limitations of artificial intelligence in education, there is limited focus on its impact on students' conceptual understanding. Most studies emphasize efficiency, accessibility, and academic performance, while overlooking how AI-generated shortcuts and summarized explanations influence learning depth. AI tools are effective for tasks such as subject planning, time management, identifying important topics, and clearing doubts. However, their use as a substitute for foundational learning is insufficiently examined. AI often teaches through patterns, shortcuts, and condensed logic, which may lead students to memorize solutions rather than understand underlying concepts. Current literature does not clearly distinguish between supportive and substitutive uses of AI in learning. This lack of distinction creates a gap in understanding how AI can be integrated responsibly without wearing core conceptual learning.

Research Objectives

The objective of this study is to examine how artificial intelligence tools are used by students academically and analyse their influence on study practices. This research aims to explore the role of AI in supporting activities such as planning, time management, and doubt clarification. It also aims to assess the impact of AI reliance on students' conceptual understanding. Additionally, the study aims to differentiate between the use of AI as a learning aid and its use as a replacement for foundational learning. The research further intends to highlight strategies for the responsible integration of AI in education, ensuring that AI enhances learning efficiency while preserving core understanding.

3. Methodology

This study adopts a descriptive, survey-based research design to examine the role of artificial intelligence tools in academic and professional learning contexts. The research aims to understand patterns of AI usage, students' and learners' perceptions of AI-supported learning, and attitudes toward the replacement of foundational learning by AI tools.

The primary data for this study was collected using a structured questionnaire consisting of 12 close-ended questions. The questionnaire included multiple-choice and Likert scale questions ranging from Strongly Agree to Strongly Disagree. This format was selected to ensure ease of response, consistency in data collection, and suitability for quantitative analysis.

The survey was administered online using a digital form, and responses were collected from 30 participants. The sample included senior secondary students, undergraduates, postgraduates, and a small number of employed youth. The inclusion of respondents from varied academic and professional backgrounds allowed for a broader understanding of AI usage across different learning stages. Convenience sampling was used due to time constraints and accessibility.

The questionnaire focused on four key areas: frequency of AI usage, purposes for which AI tools are used, perceptions of AI's impact on conceptual understanding, and opinions regarding AI as a support tool versus a replacement for traditional learning. Questions were designed carefully to avoid leading or biased language.

Data collected from the survey was analysed using percentage-based interpretation and visual representations such as pie charts and bar graphs. The analysis focused on identifying dominant trends, patterns, and contrasts in responses rather than making generalized claims. Ethical considerations were maintained throughout the study. Participation was voluntary, respondent identities were kept anonymous, and data was used strictly for academic research purposes.

4. Analysis

The survey results provide clear insight into how learners currently interact with artificial intelligence tools in academic and professional contexts. Analysis of the responses reveals widespread use of AI tools, accompanied by cautious attitudes toward their role in core learning.


The **demographic profile of respondents** shows that the majority belonged to the senior secondary level (Classes 11–12), with representation from undergraduate, postgraduate, and employed learners. This distribution reflects a learner group actively engaged in academic planning, examinations, and skill development, making them relevant participants for this study.
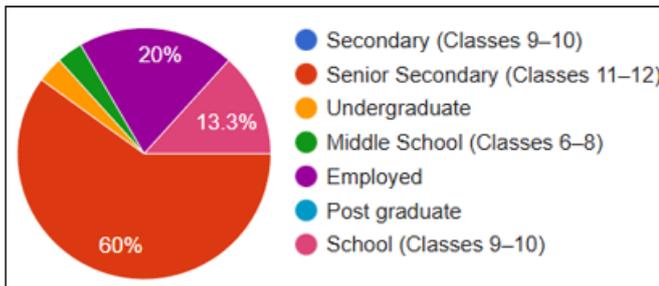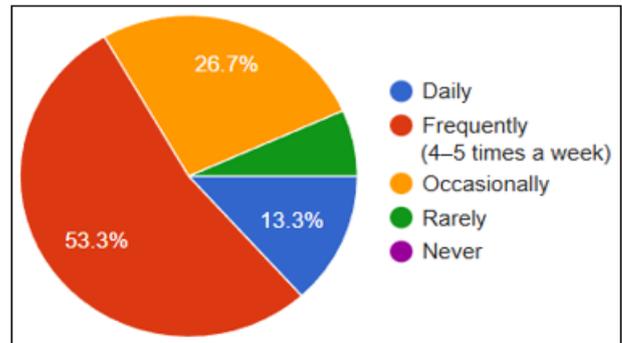

In terms of **frequency of AI usage**, most respondents reported using AI tools either daily or several times a week. Very few participants indicated rare usage, and almost none reported never using AI tools. This finding highlights the rapid integration of AI into regular learning practices and suggests that AI tools have become a common academic aid rather than a novelty.
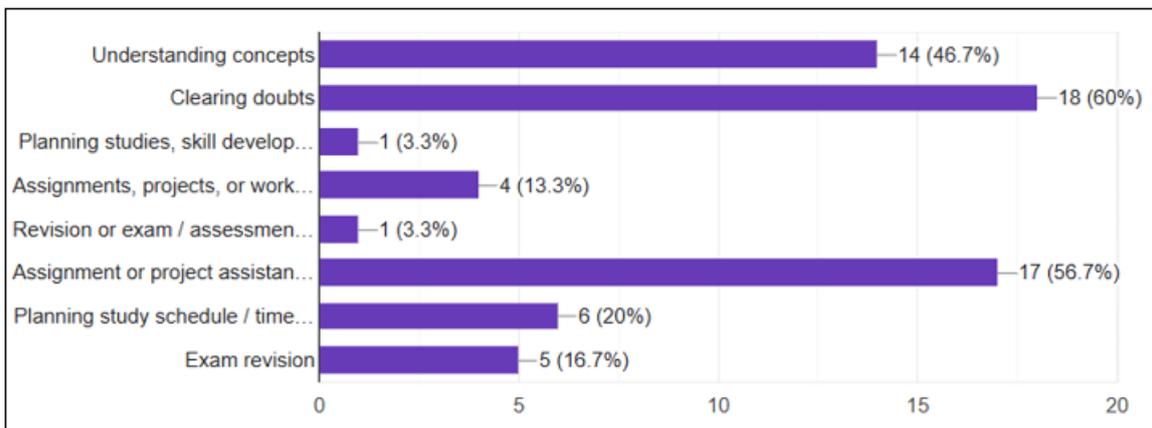

When asked about the **primary purposes of AI usage**, respondents most frequently selected understanding concepts, assignment or project assistance, and study planning or scheduling. This indicates that learners are using AI beyond surface-level tasks, relying on it for both organizational support and learning assistance. However, exam revision was not the most dominant purpose, suggesting that AI is viewed more as a learning aid than a last-minute exam tool.
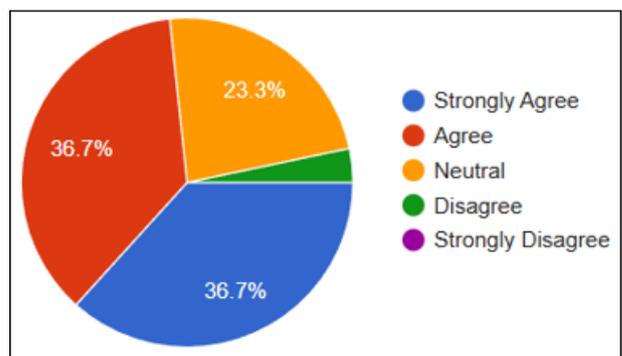

A strong majority of respondents agreed that **AI tools help save time in academic or professional learning activities**. This supports existing literature that highlights AI's efficiency-enhancing capabilities. Time-saving benefits appear to be one of the most widely recognized advantages of AI tools.
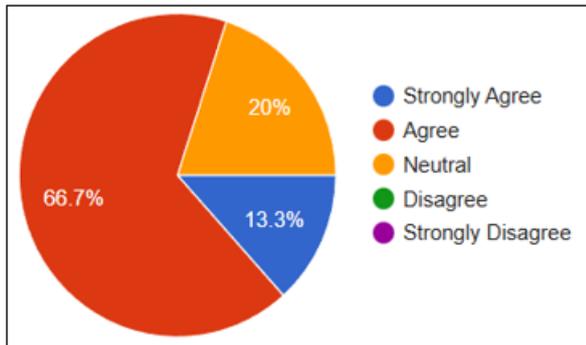
Responses related to **conceptual understanding** showed that while many respondents agreed that AI improves understanding, the level of agreement was moderate. This suggests that learners perceive AI as helpful but not sufficient on its own for deep learning. This finding is important as it indicates awareness of AI's limitations.
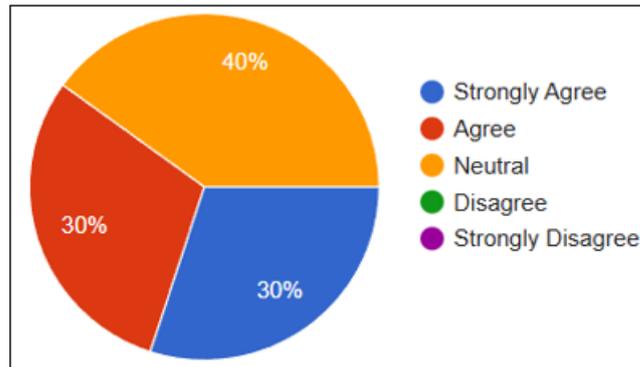

Further results showed that a majority of respondents agreed that **learning through textbooks, instructors, or hands-on practice leads to better retention** than AI-generated explanations. This reinforces the importance of traditional learning processes in developing lasting understanding.
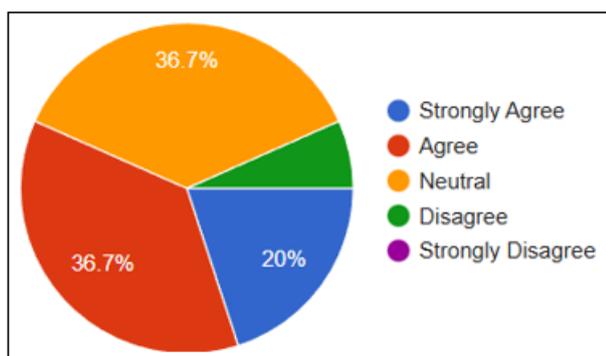

A significant portion of respondents agreed that **AI often provides shortcuts, summaries, or simplified explanations rather than detailed conceptual explanations.** This directly supports the central argument of this study. Learners recognize that while AI simplifies learning, it may not always encourage deep conceptual engagement.
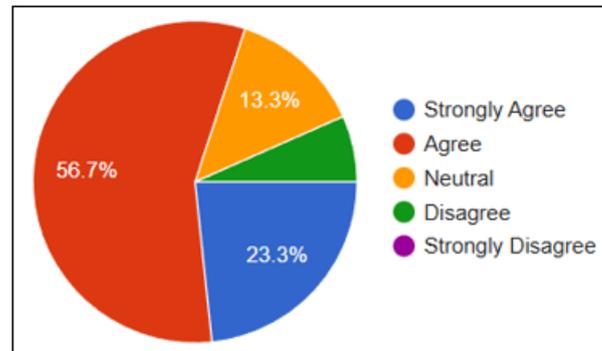

Strong agreement was observed for the statement that **excessive dependence on AI can reduce independent thinking and problem-solving abilities**. This reflects a growing awareness among learners of the cognitive risks associated with over-reliance on AI tools.
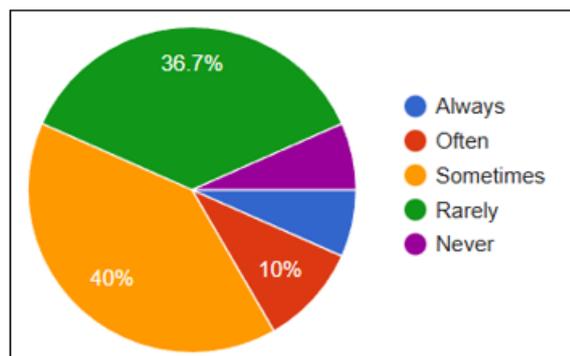
Regarding **reliance on AI for core or foundational concepts**, most respondents selected "sometimes" or "rarely," with very few choosing "always." This demonstrates that AI has not fully replaced traditional learning methods. Instead, learners appear to use AI selectively, primarily as a supplementary resource.
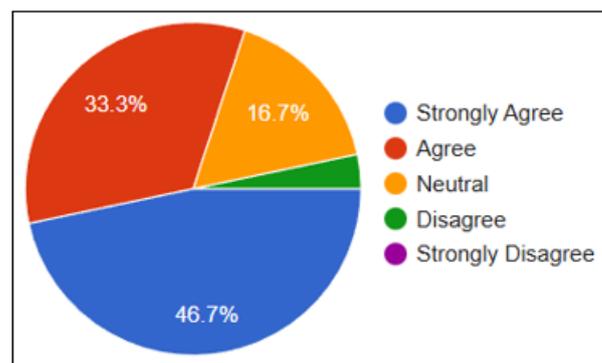
One of the most decisive results emerged from responses to whether **AI should be used mainly as a support tool rather than a replacement for core learning**. A clear majority strongly agreed or agreed with this statement, indicating strong support for strategic and limited AI use.
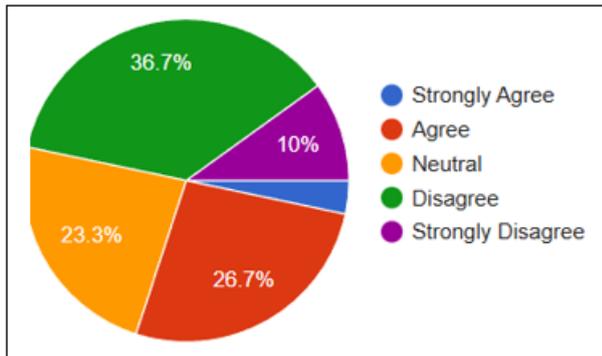
Finally, most respondents disagreed with the statement that **AI can completely replace traditional learning methods such as classroom teaching, textbooks, or practical training**. This result reinforces the idea that learners value human-led and foundational learning despite frequent AI usage.

5. Discussion

The findings of this study align closely with existing literature that portrays artificial intelligence as a powerful support tool in education rather than a substitute for foundational learning. High frequency of AI usage among respondents confirms that AI tools have become an integral part of modern learning practices. However, the nature of usage reflects cautious and selective dependence.

While AI is widely acknowledged for saving time and improving efficiency, learners demonstrate awareness of its limitations in developing deep conceptual understanding. The recognition that AI often provides shortcuts and condensed explanations supports the research gap identified in this study. Learners appear to differentiate between efficiency and understanding, using AI strategically rather than blindly.

The moderate reliance on AI for core concepts suggests that learners still depend on textbooks, instructors, and practice-based learning for foundational understanding. This finding reinforces the argument that learning involves more than accessing correct answers; it requires engagement with concepts, reasoning processes, and gradual comprehension.

The strong agreement regarding reduced independent thinking due to excessive AI use highlights the cognitive risks associated with over-reliance. AI-generated explanations, while convenient, may reduce opportunities for problem-solving and critical thinking if used excessively.

Overall, the discussion supports the idea that AI's role in education should be carefully reviewed and regulated. AI can assist with planning, clarification, and revision, but core learning should remain rooted in conceptual engagement and human instruction.

6. Limitations & Ethical Concerns

This study has several limitations. The sample size of 30 respondents limits the generalizability of the findings. Additionally, the use of convenience sampling and self-reported responses may introduce bias. The demographic distribution was skewed toward senior secondary students, which may influence overall trends.

Ethically, care was taken to ensure voluntary participation, anonymity, and responsible data use. The study does not promote misuse of AI tools and emphasizes responsible, guided usage.

7. Conclusion & Future Scope

The study concludes that while artificial intelligence tools are widely used and valued for efficiency and support, they are not perceived as a replacement for foundational learning. Learners recognize both the benefits and risks associated with AI use. The findings emphasize the need for balanced integration of AI in education, where AI supports learning without degrading conceptual understanding.

Educational institutions should promote AI literacy and responsible usage guidelines. Students should be encouraged to use AI for planning, doubt clarification, and revision, while relying on traditional methods for core learning. Future research may expand the sample size and explore impacts of AI use on learning outcomes.

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Volume 15 Issue 2, February 2026
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Paper ID: SR26212194927   DOI: https://dx.doi.org/10.21275/SR26212194927   819