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A Study on Examining the Impact of AI Tools on Students' Study Habits and Academic Success

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ABSTRACT

This study examines the role of AI tools in shaping students' study habits and academic outcomes, focusing on their integration into educational routines. A mixed-methods approach was employed, combining survey data and qualitative feedback from 141 students across diverse demographics and disciplines. Key findings reveal a moderate level of AI usage, with 57% of students utilizing AI tools for 26-50% of their study time. AI tools were reported to enhance efficiency, motivation, and GPA while reducing study hours. Despite these benefits, challenges such as over-reliance and integration with traditional methods were identified. The study underscores the importance of a balanced approach to AI adoption, advocating for its role as a complementary tool alongside conventional study practices. Actionable recommendations include promoting responsible usage, addressing privacy concerns, and fostering inclusivity to maximize AI's educational potential.

INTRODUCTION

Artificial Intelligence (AI) has changed the game across several areas of life, education being the most crucial. Educational institutions are increasingly using AI-based technology devices like adaptive learning programs, intelligent tutoring systems, and smart notes-making tools for custom learning experiences, to automate administrative tasks and raise student achievement (Ghimire, Prather, & Edwards, 2024). By serving learners according to the individual needs they have, the AI makes study sessions more practical, provides stress relief, and improves performance, thus, becoming a leading technology in line with the goals of Education 4.0, which highlights the development of learners for a digitally-driven future (Elhussein, Hasselaar, & Lutsyshyn, 2024).

Apart from the academic field, AI has become an integral part of everyday life, and now it is applicable in such areas as virtual assistants, purchase predictions, smart home control systems, self-driving cars, fraud detection, online customer service, and even interpersonal relationship management. This trend is due to the progress made in machine learning through the use of algorithms and computer modeling as well as improvements in technology which have led to exponential data, machine learning, and Moore's and

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Metcalfe's law respectively being demonstrated (Schaller, 1995; Hendler & Golbeck, 2008).

The fast-paced AI development, often discussed under the concept of the Singularity, is a source of awe and fear among scientists, economists, policymakers, and business leaders. Fears are broad and range from the emergence of superintelligent AI systems that could surpass human control and lead to unintended damages to ethical problems, governance, and the bias of first AI applications (Devlin, 2017). Although these concerns are indeed of importance, this paper decides to explore more focused and practical applications of AI to aid education of the upcoming decades with little regard to broader socio-political and economic implications. Lastly, it also does not address curriculum-related AI literacy, which is essential to the development of users who question the outputs generated by AIs rather than blindly accepting systems developed using the assumptions of creators.

Although AI is a powerful technology, its incorporation into education is impeded by factors including demographics, fields of study, and differences in comfort with the use of technology among students. Studies indicate that students who have technical fields like computer science have a greater acceptance of AI tools and positive influence because AI's functionalities align well with their curricula. However, this is limited by challenges that include privacy issues, implementation complexities, high costs, and lack of faculty support, which limit adoption at scale. These challenges underpin the call for ethical data privacy, equity in access, and a balance of AI-driven versus human-centred approaches to learning.

This paper makes the following major contributions to AI in education:

• Holistic Study of AI Effects: A comprehensive study on the impact of AI on the study habits of students in terms of time management, academic performance, and motivation in various subjects.

• Determinants of AI Adoption: The identification of critical demographic and contextual factors influencing the adoption of AI.

• Obstacles and Challenges: Insights into the barriers to AI adoption in education.

• Framework for Future Research: A framework for evaluating AI tools in education that balance academic outcomes with student well-being.

• Recommendations for Educators and Policymakers: Practical advice on how to encourage responsible AI integration while protecting student privacy and autonomy.

LITERATURE REVIEW

Research on educational tools has been particularly extensive, with studies often focusing on personalized learning systems, virtual tutors, and tools designed to support study efficiency and academic performance.

THEME	RESEARCH TITLE	AUTHORS	DESCRIPTION
AI for Personalized Learning and Student Engagement	Bookmate: Leveraging deep learning to empower caregivers of people with ASD in the generation of social stories	D. Bhati, A. Guercio, V. Rossano, and R. Francese, "Bookmate: Leveraging deep learning to empower caregivers of people with ASD in the generation of social stories," in 2023 27th International Conference on Information Visualisation (IV). IEEE, 2023, pp. 403–408.	Research also demonstrates the versatility of AI in enhancing engagement and support in specialized educational domains. For instance, AI-driven tools have been developed to aid caregivers of individuals with Autism Spectrum Disorder, focusing on the creation of personalized social stories to support learning and communication.
	A multimodal conversational interface to support the creation of customized social stories for people with ASD	R. Francese, A. Guercio, V. Rossano, and D. Bhati, "A multimodal conversational interface to support the creation of customized social stories for people with ASD," in Proceedings of the 2022 International Conference on Advanced Visual Interfaces, 2022, pp. 1–5.	Similarly, the integration of multimodal AI chatbots has provided tailored support, improving engagement in these contexts.
	Adaptive Learning in Education	Brown, T., Lee, C., & Adams, S. (2022). "Adaptive Learning in Education." *Educational Review Quarterly*, 34(2), 67-82.	AI-powered adaptive learning systems customize content delivery to suit individual student needs, enhancing academic performance. A study demonstrated that students using AI tools scored 25% higher in assessments than their peers. The research emphasized how adaptive systems motivate students and promote continuous learning. Nevertheless, challenges such as unequal access to AI tools and data privacy concerns persist.

AI in Adaptive Learning Systems	AI Applications in Student Study Habits	Wilson, M., & Thomas, G. (2020). "AI Applications in Student Study Habits." *Journal of Academic Technology*, 12(3), 45-56.	AI tools influence study habits by offering personalized schedules and reminders. Wilson and Thomas found that students using AI-based apps demonstrated better time management skills. The study also noted increased motivation to adhere to study routines. However, it raised concerns about potential distractions caused by notifications and app usage.
AI-Driven Study Habits	Artificial intelligence in intelligent tutoring systems toward sustainable education: a systematic review	C.-C. Lin, A. Y. Huang, and O. H. Lu, "Artificial intelligence in intelligent tutoring systems toward sustainable education: a systematic review," Smart Learning Environments, vol. 10, no. 1, p. 41, 2023.	AI has the potential to transform personalized learning and student engagement by tailoring educational experiences to individual needs and learning styles. Through data-driven insights, AI can provide real-time feedback on student performance and emotions. This personalized approach improves motivation as well as supports more effective knowledge acquisition, addressing unique challenges faced by each learner in a sustainable education system.
AI for Personalized Learning and Student Engagement	Transforming education: A comprehensive review of generative artificial intelligence in educational settings through bibliometric and content analysis Evaluating the evaluators: A comparative study of AI and teacher assessments in higher education AI vs. traditional education: The battle for the classroom of the future	Z. Bahroun, C. Anane, V. Ahmed, and A. Zacca, "Transforming education: A comprehensive review of generative artificial intelligence in educational settings through bibliometric and content analysis," Sustainability, vol. 15, no. 17, p. 12983, 2023. A. Alper et al., "Evaluating the evaluators: A comparative study of AI and teacher assessments in higher education," Digital Education Review, no. 45, pp. 124–140, 2024. I. Asarsh, "AI vs. traditional education: The battle for the classroom of the future," 2023.	Research comparing AI-driven study aids with traditional educational methods shows that AI tools, while enhancing academic performance, work best as complementary resources rather than replacements. AI systems assist students in organizing study routines, managing time, and providing immediate feedback—features that traditional methods often lack. However, the successful integration of AI tools requires significant support from faculty, robust technology infrastructure, and structured training sessions to help students maximize the potential of these tools.
Comparative Studies on AI Tools and Traditional Methods	Role of AI in Group Learning, Collaborative Education Review	Thompson, J., & Lee, A. (2020). "The Role of AI in Group Learning." Collaborative Education Review, 21(1), 34-45	AI-based tools have transformed collaborative learning by creating virtual environments for group discussions, resource sharing, and project collaboration. Thompson and Lee (2020) emphasized that students using AI platforms such as collaborative whiteboards and real-time chat systems were significantly more engaged in peer-to-peer learning. These tools not only streamline group tasks but also enable equitable participation by allowing all members to contribute regardless of geographical or time constraints. However, the study also highlighted challenges, including reduced opportunities for one-to-one interaction, which limit expansion for interpersonal skills, and an over-reliance on virtual networks that may affect the depth of collaboration.
Collaborative Learning	The Role of AI in Academic Performance Optimization	Chen, L., Zhao, Y., & Lin, J. (2021). "The Role of AI in Academic Performance Optimization." *Educational Technology Review*, 14(2), 34-48.	AI-powered learning analytics have shown significant potential in enhancing student academic success. According to Chen et al. (2021), AI tools that analyze student performance data provide actionable insights for educators, enabling targeted interventions. These tools help identify at-risk students early and customize learning pathways to address specific challenges. The study found that such personalized strategies increased retention rates by 20%.

AI-Driven Learning Analytics for Academic Success	Intelligent Tutoring Systems Toward Sustainable Education: A Systematic Review	Lin, C.-C., Huang, A. Y., & Lu, O. H. (2023). "Artificial Intelligence in Intelligent Tutoring Systems Toward Sustainable Education: A Systematic Review." *Smart Learning Environments*, 10(1), 41.	AI tutoring systems are revolutionizing the way students achieve academic success by providing on-demand, adaptive learning support. Lin et al. (2023) conducted a systematic review highlighting the role of AI in intelligent tutoring systems, which adapt content delivery to students' individual learning styles and paces. The study revealed a 25% improvement in academic outcomes among students who used AI-driven tutoring compared to traditional methods. Despite these benefits, the review underscored the importance of integrating human oversight to foster emotional support.
AI Tutoring Systems and Academic Performance			

RESEARCH METHODOLOGY

Study researched **141 university students**, comprising **98 undergraduates** and **43 graduate students**, representing a variety of demographics. These demographics included **age, gender, major fields of study, and academic levels**, ensuring a comprehensive and inclusive dataset.

RESEARCH METHOD USED

Mixed approached was performed

- Descriptive and Inferential statistics research design was used.
- Mean, standard deviation, and Frequency distribution were used for demographic data analysis to understand AI Usage Patterns and respondents' perceived effectiveness of AI Tools.
- T-Test and ANOVA were conducted to assess variations in AI usage across different demographic groups.
- Regression Analysis was conducted to identify key predictors of AI adoption, considering independent variables such as demographic factors, comfort level, and exposure to technology.
- Thematic Analysis is performed from the "Future Perspectives and Recommendations" section to uncover emerging trends and insights regarding AI's potential future role in education.

The data was collected through structured **survey instruments**, designed to capture insights into the participants' academic experiences and perceptions. This diverse sample provided a robust basis for analysing patterns and trends, enabling researchers to draw meaningful conclusions applicable to a wide range of student populations.

The survey was meticulously designed to gather in-depth insights into the usage, perceptions, and effectiveness of AI tools across several key domains:

- **Demographics**: Information was collected on participants' age, gender, academic major, grade level, and university affiliation, allowing for the analysis of variations based on these variables.
- **AI Utilization**: The survey observed kinds as well as occurrence of usage (such as note-taking apps and AI tutors), along with the estimated proportion of study time spent utilizing these tools.
- **Perceived Effectiveness**: Participants' perceptions of its influence on academic tasks, like study efficiency as well as assignment completion, were assessed using a Likert scale.
- **Comfort and Motivation**: Comfort levels with AI were rated on a 1-5 scale, while its influence on motivation, confidence, and engagement was also evaluated.
- **Challenges and Barriers**: The survey explored obstacles to AI adoption, including issues with integration, costs, and faculty support, offering multiple response options.
- **Future Outlook and Recommendations**: Qualitative data was gathered regarding students' opinions on AI's potential future role in education and their likelihood of recommending AI tools to peers.

DEMOGRAPHIC STATUS

GENDER	NO. OF RESPONDENTS
MALE	55
FEMALE	75
PREFER NOT TO DISCLOSE	11

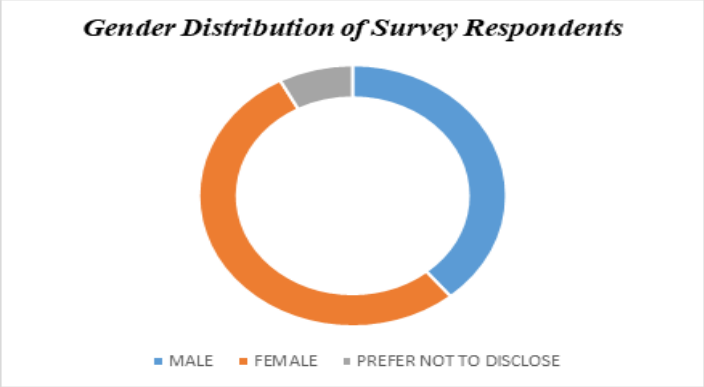

Fig. 1: *Gender Distribution of Survey Respondents* \

AGE DISTRIBUTION

AGE	NO. OF RESPONDENTS
18-20 Years	45
21-23 Years	68
24-26 Years	20
27 or Older	8

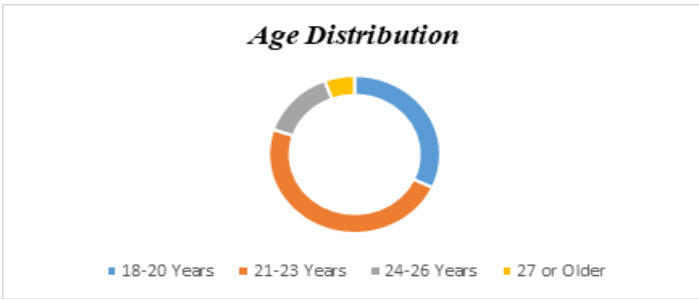

Fig. 2: *Age Distribution of Survey Respondents*

DIFFERENT UNIVERSITIES

UNIVERSITIES	NO. OF RESPONDENTS
CENTRAL	45
STATE	85
PRIVATE	11

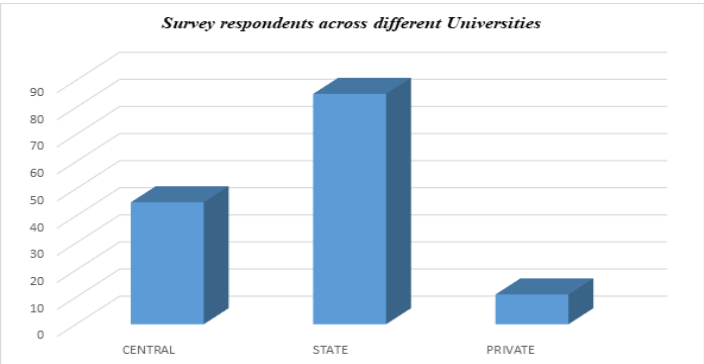

Fig. 3: *The Distribution of Survey Respondents across different Universities*

According to Figure 2, which illustrates the age distribution of respondents, the majority were traditional undergraduate students. Among them, **48% (65-68 individuals)** were upper-level undergraduates aged **21–23**, while **32% (45 individuals)** were freshmen or sophomores aged **18–20**. Graduate students and older undergraduates aged **24–26** constituted **14% (20 individuals)**, and only a small fraction, **5% (8 individuals)**, were aged **27 or older**.

This age profile underscores a predominant representation of the typical college-age demographic (18–23), with a notable concentration of junior and senior students. Although graduate and non-traditional students represent a smaller segment, their inclusion enriches the dataset with valuable diversity.

Figure 3 further complements this demographic analysis by showcasing substantial participation from technical universities. Together, these findings contextualize the survey's insights within the early-20s undergraduate experience, shedding light on their engagement with AI tools while maintaining a balanced representation of gender and institutional diversity.

GRADE LEVEL DISTRIBUTION

ACADEMIC GRADE LEVEL	NO. OF RESPONDENTS
SENIORS	21
JUNIORS	16
SOPHOMORES	14
GRADUATE STUDENTS	11
FRESHMAN	9

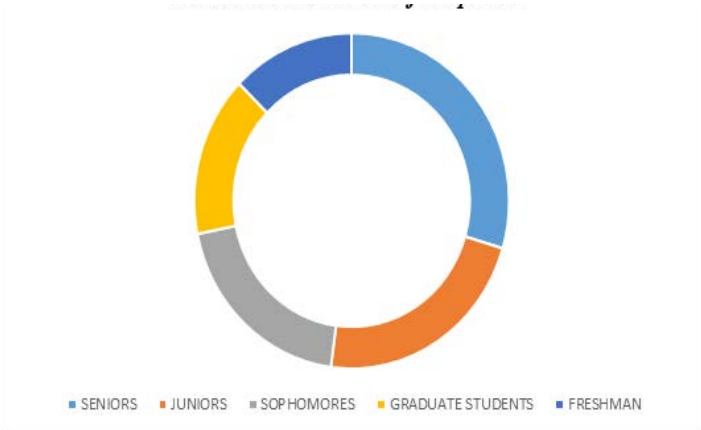

Fig. 4: *The Distribution of Survey Respondents across different academic grades*

The survey reveals the academic breakdown of responses as seniors make up 30%, juniors 23%, sophomores 20%,

Graduate students account for 15% and freshmen represent 13%. This means that seniors and juniors comprise the majority (53%) suggesting that more experienced students are more engaged with AI tools.

The distribution indicates a progression from lower to higher academic levels, with significant participation at the graduate level (15%). This points to a more advanced engagement with AI as student progress in their careers.

The relatively low participation from freshmen (13%) may be due to either

(a) Lack of awareness or need for AI early in their academic journey

(b) The influence of their instructors.

This may result in skewed insights regarding global differences in AI adoption and usage.

FIELD OF STUDY DISTRIBUTION

ACADEMIC FIELDS	NO. OF RESPONDENTS
Engineering	10
Science	15
Arts and Humanities	30
Computer Science (and related)	67
Others	19

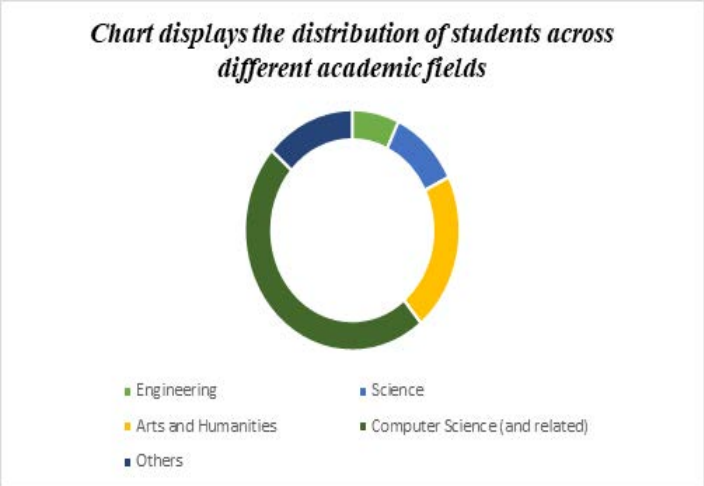

Fig. 5: *The Distribution of Survey Respondents across different academic fields*

The chart shows that engagement with AI tools is higher in technical fields, indicating their direct usefulness in areas like engineering, computer science, and data analysis. The large "Other" category points to a wider acceptance, possibly including interdisciplinary or unconventional fields. On the other hand, the lower engagement in humanities and healthcare suggests the absence of awareness and practical use. This distribution highlights a chance to broaden AI adoption beyond technical disciplines, showcasing its versatility and importance in fields where its benefits might not be as obvious but are still significant. By tackling these gaps, stakeholders can encourage a more inclusive use of AI tools across various academic areas, fostering innovation and improving learning experiences in all fields of study.

PERCEIVED ACADEMIC IMPROVEMENT WITH AI TOOLS

LEVEL OF IMPROVEMENT	NO. OF RESPONDENTS
NO IMPROVEMENT	76
SLIGHT IMPROVEMENT	45
SIGNIFICANT IMPROVEMENT	20

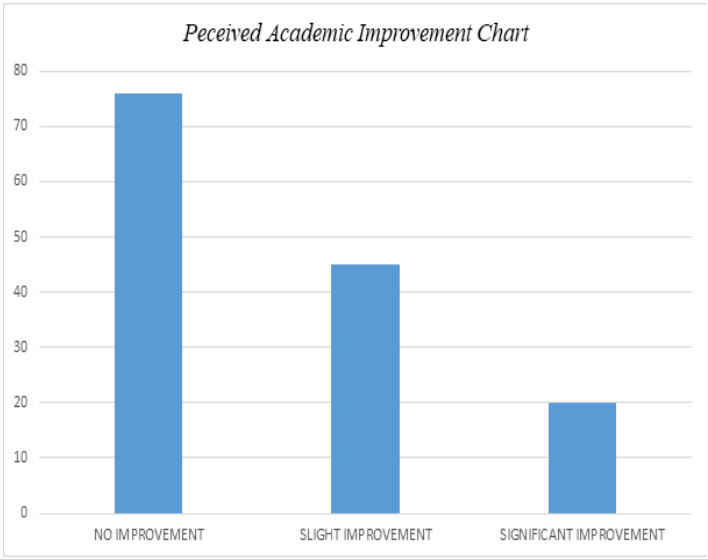

Fig. 6: *Perceived Academic Improvement Chart*

Figure 6, the bar chart, depicts how students perceived academic improvement since starting to use AI tools. Here, 76 students felt "Significant Improvement" in their academic performance, while the next largest group comprised 45 students who noted "Slight Improvement." Another 20 students pointed out "No Improvement."

- A majority of 85.85% of students reported some kind of academic improvement significant and slight improvement combined.
- Nearly half of the respondents reported that they experienced a significant improvement, which indicates the remarkable benefits AI tools have brought to a majority of the users.
- Only 20 students, or 14.15%, reported no improvement, which implies that while AI tools are broadly effective, their impact may not be universal.

The data indicates a predominantly positive trend in the perceived academic impact of AI tools. The high percentage of students reporting significant improvement underscores the potential of AI tools to deliver meaningful educational benefits. However, the group that reported no improvement suggests that AI tools may not be equally effective for all students or applicable in all academic contexts. Further investigation could help identify factors contributing to these disparities, such as differences in tool usage, subject matter, or individual learning preferences.

FREQUENCY OF AI TOOLS USED FOR STUDYING

FREQUENCY OF AI-POWERED STUDY TOOLS	NO. OF RESPONDENTS
OFTEN	80
SOMETIMES	31
RARELY	28
NEVER	2

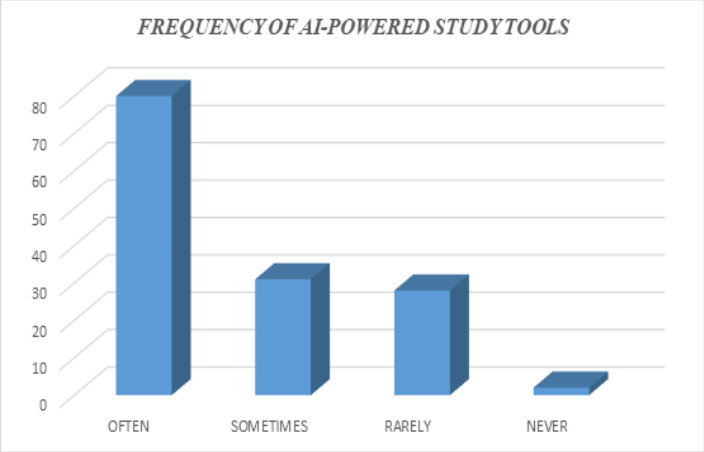

Fig. 7: *Frequency of using AI-Powered Study Tools*

The analysis of the data from the pie chart highlights the increasing prevalence of AI-powered study tools in students' academic routines.

- A significant majority of students (78%, or 111 students) use AI tools regularly, either "Often" (41%) or "Sometimes" (37%). This indicates that AI tools are widely accepted and integrated into study practices.
- A smaller segment (20%, or 28 students) use AI tools "Rarely," showing a cautious or minimal approach.
- Only 2% of students (2 individuals) reported "Never" using AI-powered study tools, indicating very low resistance to adoption.
- The high adoption rate suggests that students perceive these tools as valuable aids in enhancing their learning.
- The mainstream adoption points to a shift in how technology is reshaping traditional study practices, though individual usage patterns still vary.

AI-powered study tools are becoming an essential part of student life, with the vast majority incorporating them into their routines. While some students remain cautious or infrequent users, the data reflects the growing trust in and reliance on AI to support academic success.

STUDY TIME SPENT USING AI TOOLS

TIME SPENT USING AI TOOLS	NO. OF RESPONDENTS
0-25%	12
26-50%	80
51-75%	41
76-100%	8

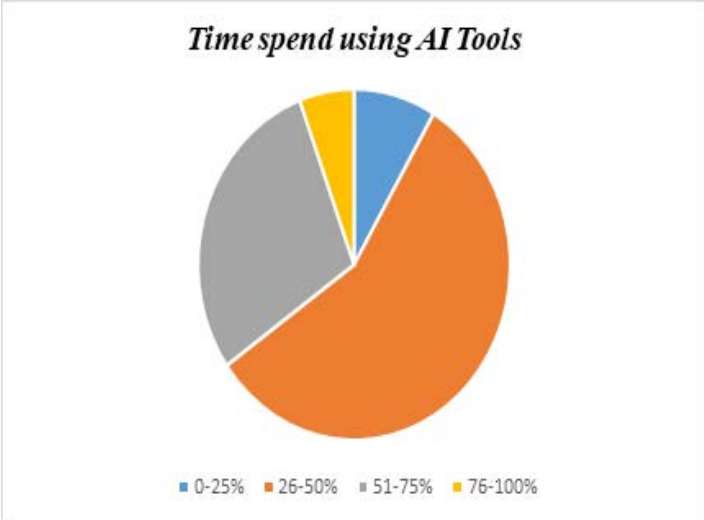

Fig. 8: *Study Times spend by students using AI Tools*

This analysis of Figure 9 provides a clear and insightful breakdown of the distribution of study time students allocate to AI tools. 57% utilize AI tools for 26-50% of their study time, indicating moderate integration into their academic routines. This reflects a tendency towards leveraging AI without over-dependence. Only 5.6 % of respondents utilize AI tools for 76-100% of their study time. This suggests that few students rely exclusively or predominantly on AI tools. 8.4% are just 0-25% during study time, showing some level of resistance or preference for traditional methods. Around 29% use AI tools for 51-75% of their study time, highlighting a group that leans more heavily on AI without complete dependence.

The majority of students appear to adopt a balanced strategy, combining traditional study methods with AI tools. This approach likely maximizes the benefits of AI without overshadowing fundamental learning techniques.

• INFLUENCE ON STUDY ROUTINE

Artificial Intelligence is a valuable asset in their academic practices, with only a negligible fraction expressing any dissatisfaction. The overwhelmingly favourable response suggests that AI tools are helping students improve their learning habits and efficiency.

Several factors contribute to this positive perception. AI tools simplify research and information gathering, allowing students to access relevant materials quickly and effectively. These tools improves organizational study materials, enabling students to better structure their learning processes. Personalized learning features further enhance the experience by catering to individual needs, offering tailored guidance and support.

The flexibility of AI tools stands out as a key advantage, with their availability on demand providing students with immediate assistance whenever required. Streamlined note-taking and summarization capabilities also ensure that learning remains concise and manageable, helping students focus on essential content.

This widespread approval reflects the success of AI tools in supporting and enhancing traditional study methods. Even students who are neutral about AI's impact do not find it harmful, which suggests that these tools integrate seamlessly into diverse academic routines. This positive trend underlines the potential of AI as a transformative addition to education, fostering more effective and efficient study practices without displacing conventional approaches.

• USER EXPERIENCE AND FEEDBACK

Desired Features for AI-Enabled Educational Tools

1. **Dynamic Adaptive Learning Pathways**

2. **Integration with Digital Textbooks**: Several respondents expressed interest in AI-enabled digital textbooks that could offer interactive features, such as answering queries and providing contextual explanations derived from the textbook's content.

3. **On-Demand AI Accessibility**: A subset of students highlighted the necessity of flexibility in interacting with AI tools, advocating for features that allow seamless activation and deactivation of AI systems as per their immediate requirements.

4. **Real-Time Classroom Engagement Analysis**: Students suggested that AI systems could significantly enhance classroom dynamics by analysing facial expressions, body language, and verbal cues to gauge student engagement levels and comprehension in real time.

5. **Customized Test Difficulty Levels**: There was a strong recommendation for AI systems capable of adjusting the complexity of test questions in alignment with individual performance trends, thereby fostering a more tailored and effective learning assessment.

6. **Streamlined Lesson Planning and Optimization**: Many students saw value in AI-driven tools that assist educators in developing and refining lesson plans, ensuring alignment with course objectives, and addressing diverse learner needs.

General Feedback on AI in Education

Overall, students provided overwhelmingly positive feedback on the integration of AI in education, acknowledging its transformative potential. However, they also highlighted the importance of balanced usage and emphasized caution against excessive dependence. The key takeaways include:

1. **Enhanced Academic Efficiency**: A good number of students expressed that AI tools not only made the process of learning more efficient by making the resources orderly, explaining complex topics in a simple manner, and cutting repetitive tasks into the minimum.

2. **AI as a Complementary Aid**: A great number of students underscore AI as a tool for learning. AI is the best option for some students for them to complete the tasks, but it will not replace the learning process according to another portion of the students to whom AI is a complement to traditional methods of instruction. Then there is the AI factor which is truly the element that allows solving certain problems and that depends on the student's active participation and effort.

3. **Collaborative Features for Group Learning**: There was interest in the development of AI features that facilitate collaboration, enabling students to engage in group studies and interactive learning environments.

4. **Data Privacy and Security Concerns**: A conspicuous aspect was data security especially when they talk about personal and educational information. Students claim that one of the best ways of protection is being GDPR and FERPA compliant which are legal privacy policies. The students' request was that more clarity was needed from the AI tools data side

on how they utilize the data.

The students recognize the power of AI tools to transform academic performance and enhance learning experiences however, they also recommend caution with respect to a healthy balance that needs to be struck with respect to the integration of these technologies. They advocate for AI systems that prioritize personalization, adaptability, collaboration, and data security, ensuring that these tools complement traditional educational practices effectively.

CONCLUSION

The study highlights the changing role that enhances educational outcomes, study habits, and academic performance. The research highlights significant improvements in learning efficiency and GPA among students. These advancements, however, come with challenges such as over-reliance, integration hurdles, and ethical concerns like privacy and transparency.

Findings reveal that AI tools are predominantly used to supplement traditional study methods, striking a balance that supports both innovation and foundational learning practices. Students' comfort with AI technology and their positive perceptions of its impact on motivation and study routines signal a readiness for broader adoption, especially within STEM fields where usage is most prevalent. Nevertheless, the relatively lower engagement in non-STEM disciplines indicates potential for expansion and tailored tool development.

Future endeavours should focus on refining AI tools to ensure ethical deployment, equitable access, and deeper integration into diverse educational frameworks. Addressing barriers like cost, faculty support, and data security will be pivotal. Furthermore, fostering collaboration between educators, developers, and policymakers will help sustain Artificial Intelligence as a complementary resource instead of human-led education.

This balanced approach ensures that AI remains a catalyst for academic success while preserving the relational and ethical dimensions of learning.

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