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RESEARCH ARTICLE

A study on experiential learning through AI tools: Impact on student engagement and learning effectiveness

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Abstract: The study aims to analyze how AI-powered tools enhance experiential learning and impact effective student engagement and learning, in an effort to fill the existing gaps regarding the influence of AI-driven learning platforms on student motivation, participation, interaction, and practical understanding. The paper focuses on the quantitative method of primary data collection through a structured Google Form administered to college students, representing their perceptions related to AI-enabled experiential learning. Findings reveal that AI-powered tools have improved practical understanding among students by making hands-on activities much clearer, interactive and easily applicable in real life. Student engagement was found to increase, reflected in heightened motivation and participation, and improved collaboration with peers and AI Systems. AI-aided learning also led to improved academic performance, thanks to clearer concepts, enhanced analysis, and more effective problem-solving. On the other hand, despite these advantages, student's reported variable comfort levels, citing challenges like unfamiliarity with tools, technical complexity and dependence on AI. Further, unequal device and internet access, issues of privacy and fears of algorithmic bias hampered engagement for some groups of students. Nobody, not all learning styles benefited equally from the AI-powered tools; technical and visual learners adapted more easily than theoretical ones. This analysis comprehensively provides evidence regarding AI's Influence on experiential learning and student engagement, which is relatively unexplored.

Keywords: *AI tools, Experiential learning, Student engagement*

Introduction

The rapid proliferation of AI in higher education has revolutionized teaching and learning globally (Bond et al., 2024; Zawacki-Richter et al., 2019). In recent years, there has been a gradual shift towards active, student-centered hands-on learning modes, and it is in this respect that experiential learning becomes a significant educational modality (Aithal and Mishra 2024; Mamatha 2021; Wang and Wen 2023). Experiential learning involves direct experience, real-world application and self-reflection, which help students acquire practical skills and sharpen their critical thinking (Aqaie 2023; Bradberry and De Maio 2019). The emergence of AI-powered tools offers unparalleled opportunities to enhance experiential learning in ways that were difficult to imagine until now. AI-powered tools, such as adaptive learning systems, intelligent tutoring platforms, and simulations, promote more active content engagement by students (Lin et al., 2023; Sari et al., 2024; Yaseen et al. 2025). These technologies offer students a personalized learning experience, an identification of their strengths and weaknesses, and real-time feedback. This facilitates the comprehension of complex concepts by students more effectively. Therefore, with greater use of AI-powered tools within the higher education sector, a need arises to understand its effect on learning outcomes, student engagement and other aspects that define the students' experience.

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Meanwhile, considering the significant recent developments in AI in education, substantial research gaps remain. Many studies are solely focused on an isolated tool or a narrow academic context, which does not consider the broader ramifications that AI has on engagement factors like behavior, motivation, emotional involvement and peer collaboration. Other key issues, such as digital inequality, privacy, bias in AI, and overreliance, have also not been properly researched. With the inclusion of AI in modern classrooms, understanding, benefits as well as the challenges is paramount. This paper investigates how AI tools support experiential learning and impact students' engagement and effective learning. It further examines the challenges of the students coming from diverse academic backgrounds and learning styles. The identification of trends in students' perceptions contributes to the Nascent literature on AI – AI-supported learning, in the context of Indian higher education.

The paper analyzed how AI tools improve experiential learning activities and support the practical understanding of students. It also investigated the effect of AI-enabled learning tools on key dimensions of student engagement, such as motivation, participation, and interaction. Further, it also assessed the effectiveness of AI-supported experiential learning on the enhancement of students' learning outcomes and academic performance.

Research Methodology

Research Design

The quantitative research design and online survey method were used in the study. Data were collected through structured questionnaires via Google Forms from the college students. A descriptive and analytical approach was used to investigate the relationship between AI tools, experiential learning and students' engagement.

Participants

The sample population consisted of undergraduate and postgraduate from the commerce, management, technology, and humanities-related streams. A sample of 58 respondents was obtained through the convenience-sampling technique to facilitate data Collection.

Data Collection Tool

The research tool was a structured questionnaire to measure student's practical understanding after using AI Tools, motivation, participation and interaction levels, comfort levels with AI tools as well as academic performance and learning outcomes. The instrument included questions and the responses of the participants were measured using a Likert scale, ranging from Strongly Agree to Strongly Disagree, along with categorical response items where appropriate.

Data Analysis Techniques

Frequencies, percentages, and graphical representations were used in the descriptive statistics analysis of the data. Comparative analysis highlighted the difference across learning styles and academic backgrounds. Trends of correlation were also checked in order to find patterns between AI usage and engagement created among students.

Results

The chart shows that most respondents are young. More than half of them, 51.7% are between 21 to 30 years old, and 39.7% are under 20. Cumulatively, these two age groups total over 90% of the participants. Very few responded for the 31 to 40 age brackets, and even fewer for the 41 to 50 age bracket with very few over 50. Thus, this survey is representative of the younger student population, but other age brackets are underrepresented.

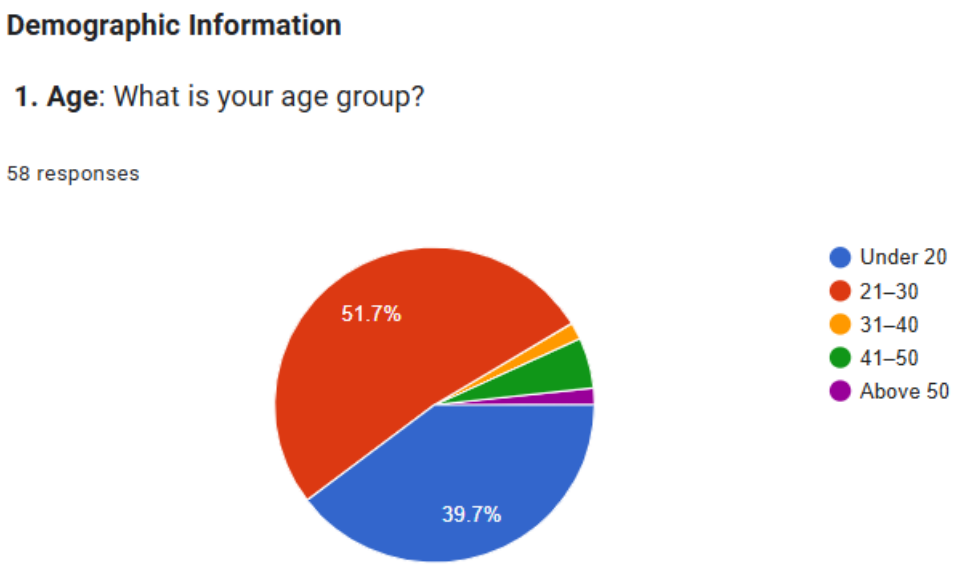

Figure 1: Age of participants

From the chart we can observe that the majority of the respondents are female, comprising about 74.1% of the sample, while only 25.9% are Male. This means the survey is primarily representative of the female students, since there were far fewer males.

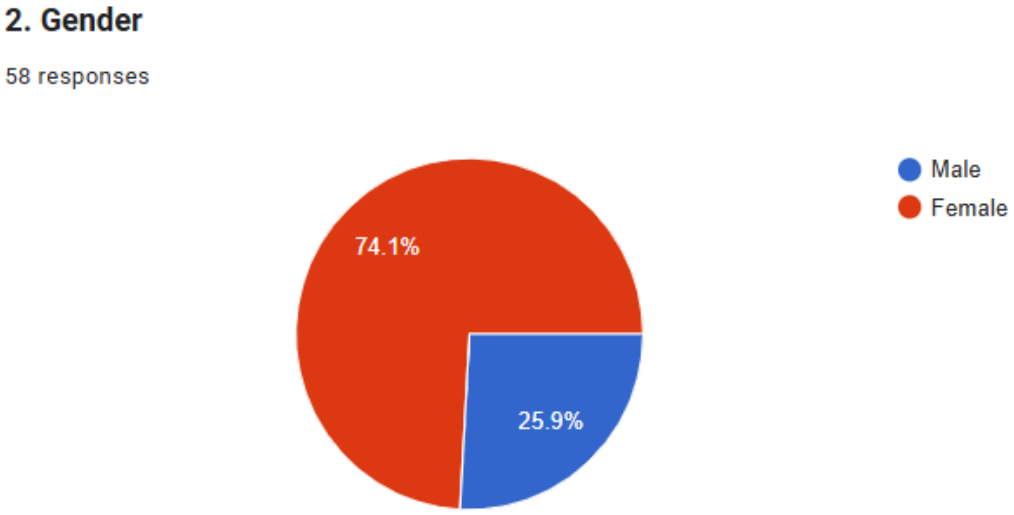

Figure 2: Gender of participants

It can be observed from the chart that 79.3%of the respondents were graduates or had higher education, while 15.5% had completed higher secondary and few of them had finished secondary school. Thus, the survey reflects the views of well-educated students with strong academic backgrounds.

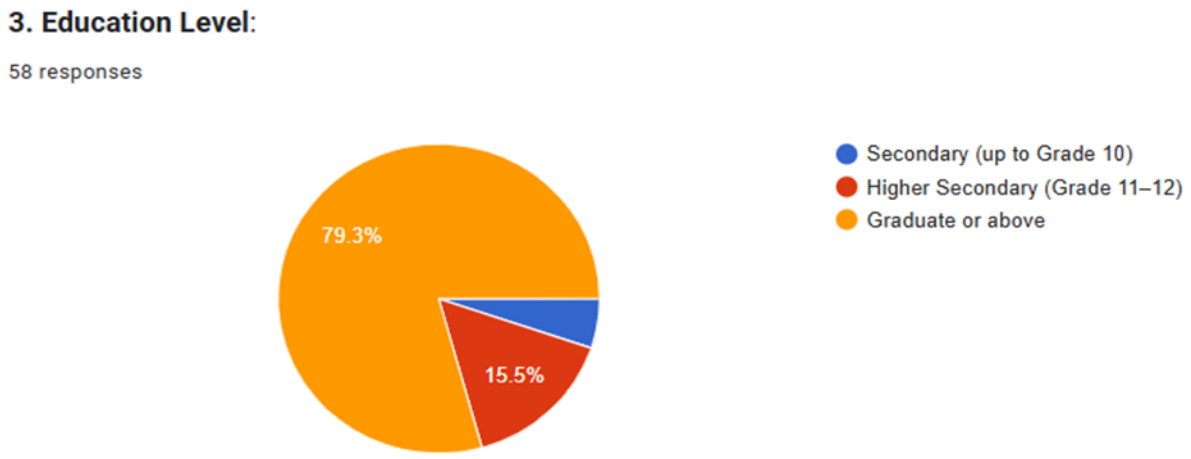

Figure 3: Education level of participants

The chart shows that most students believe AI tools help them understand practical topics better. More than half agreed or strongly agreed. About 29.3% were neutral, which means they are unsure. Only a small number disagreed. Overall, students find AI useful for improving their practical understanding.

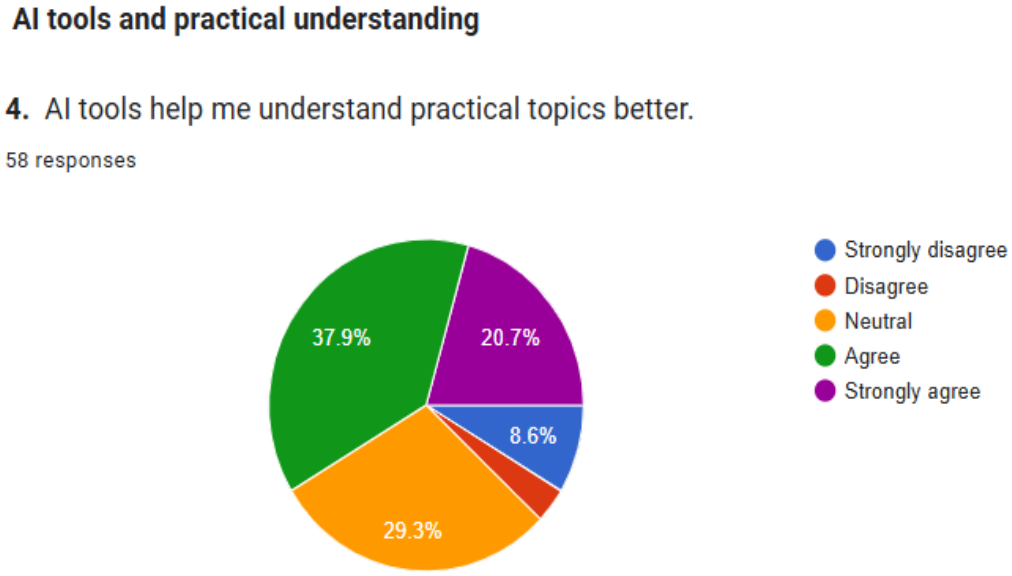

Figure 4: AI tools and practical understanding

The chart shows that most students believe AI activities make learning easier. About 55.9% agreed, and 15.3% strongly agreed. Some students, 23.7%, were neutral, indicating they are unsure or haven't used AI much. Very few disagreed. Overall, students generally view AI as helpful for making learning easier.

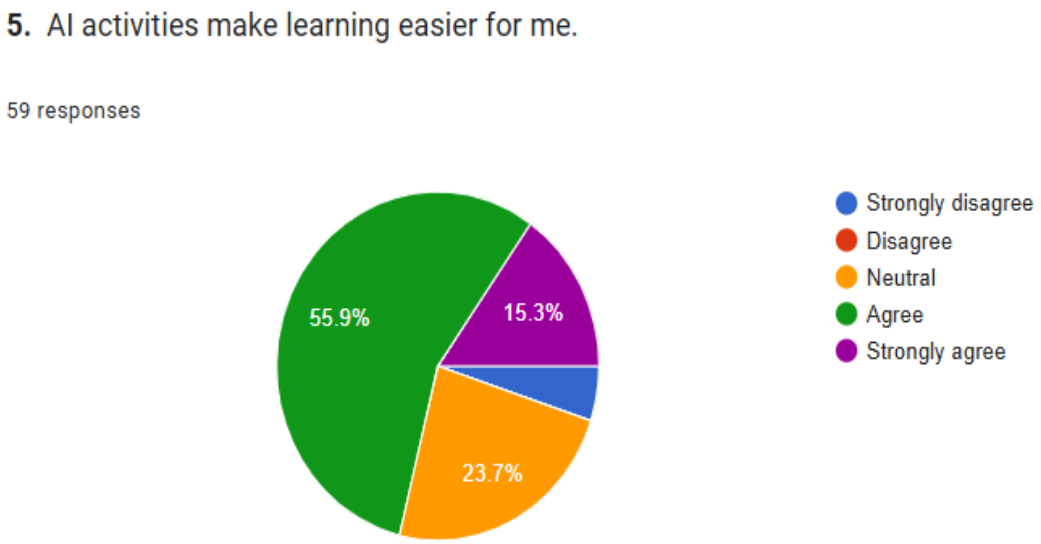

Figure 5: AI activities make learning easier for me

The chart shows that many students feel AI tools help them learn by doing, not just by reading. More than half agreed or strongly agreed. About 28.8% were neutral, which means they are unsure or haven't fully experienced this yet. Only a few disagreed. Overall, students generally believe AI supports active, hands-on learning.

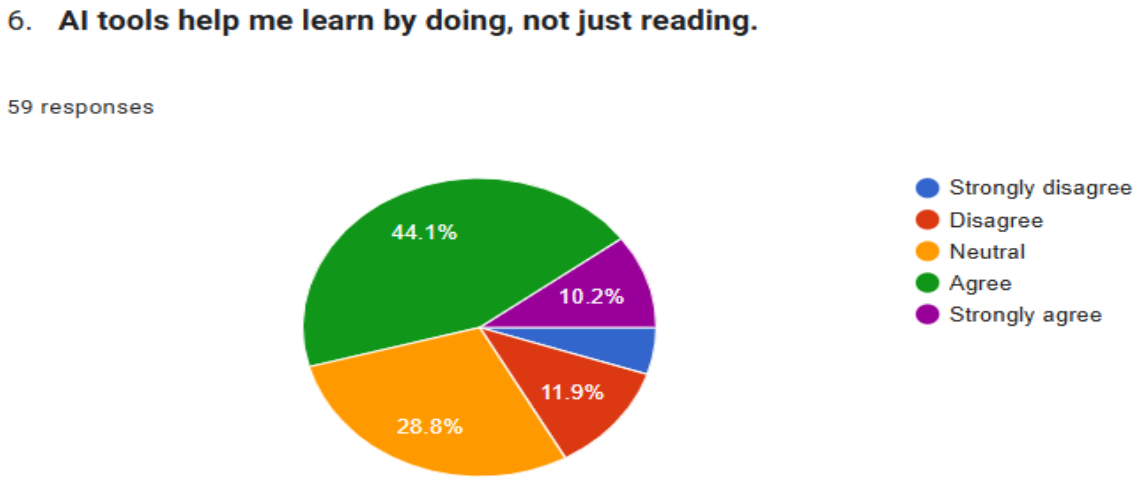

Figure 6: AI tools help me learn by doing, not just reading

This is reflected in the chart, as most students feel that AI provides clear and easy-to-understand explanations. Almost half agreed to this, while 17.2% strongly agreed. About 25.9% were neutral, meaning they find the explanation provided by AI decent but not outstanding, while very few disagreed. Overall, students tend to find AI explanations clear and useful.

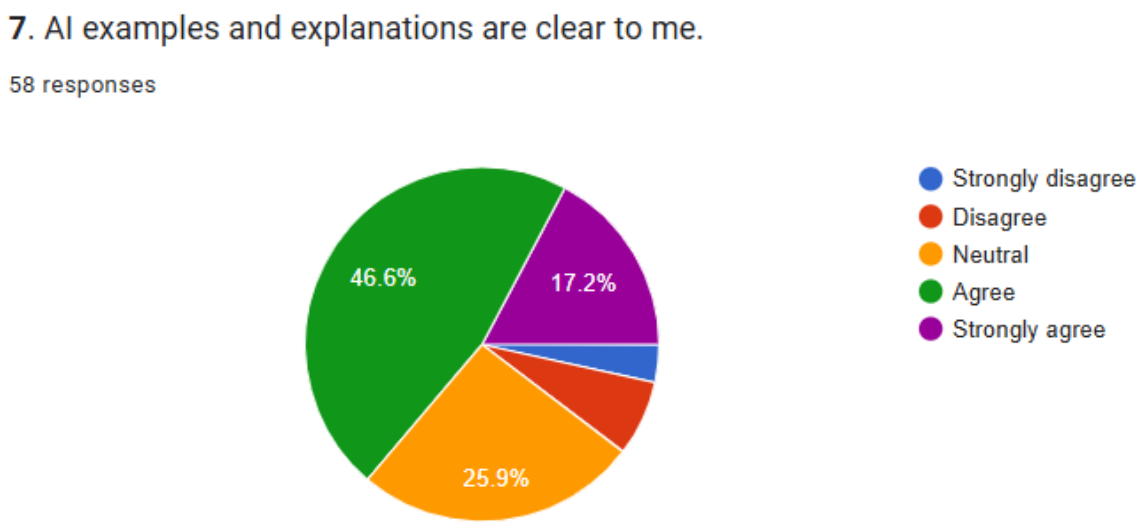

Figure 7: AI examples and explanations are clear to me

The chart shows that most students believe AI tools help them understand lessons better. About 37.3% agreed, and 15.3% strongly agreed. This adds up to more than half of the respondents. Around 33.9% felt neutral, meaning they are unsure or think AI's impact depends on how it is used. Very few students disagreed. Overall, students usually view AI as helpful for improving their understanding of lessons.

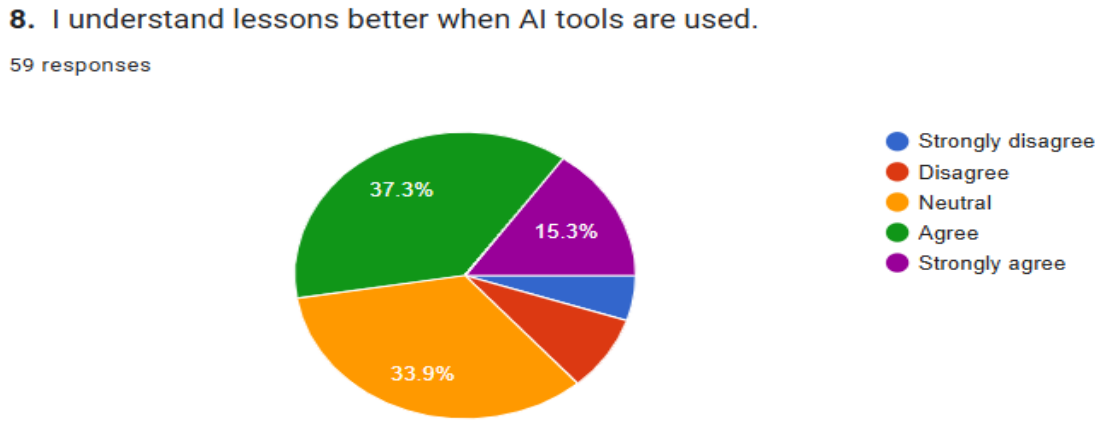

Figure 8: I understand lessons better when AI tools are used

The chart shows that many students find learning more interesting when AI tools are used. Nearly half agreed or strongly agreed. About 37.3% were neutral, meaning they are unsure or feel it depends on how AI is used in class. Only a few students disagreed. Overall, AI tools are often viewed as helpful for making learning more engaging.

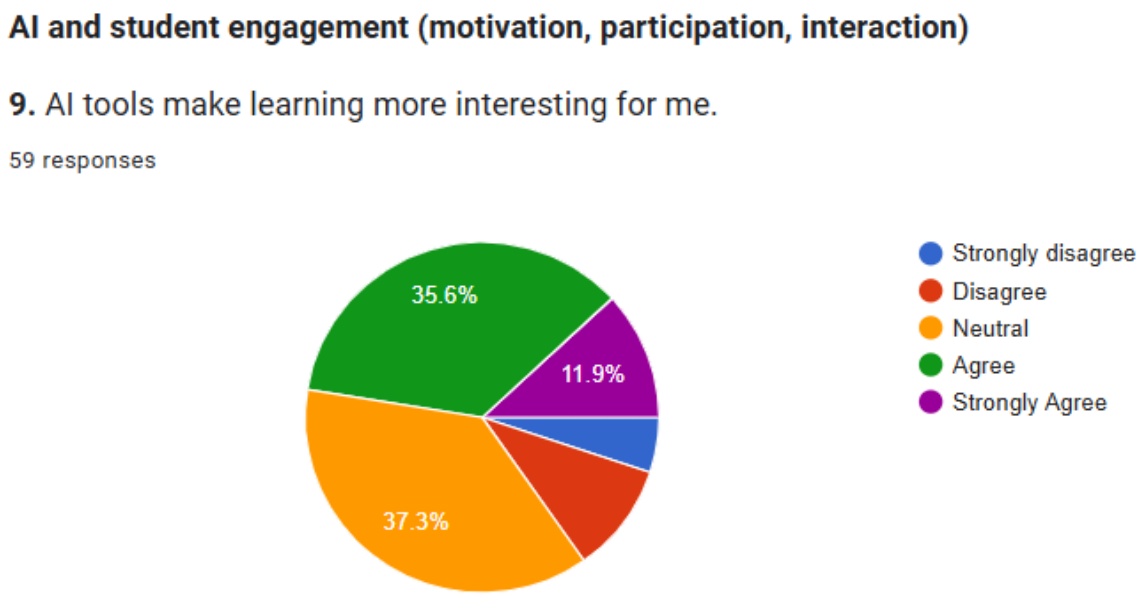

Figure 9: AI tools make learning more interesting for me

The chart shows that many students believe AI tools help them participate more in class. About 36.2% agreed, and a few strongly agreed. However, the largest group, at 37.9%, was neutral, indicating that AI does not significantly affect everyone. Around 19% disagreed, saying AI does not boost their involvement. There were no strong negative responses. Overall, AI has a mostly positive or neutral effect on class participation.

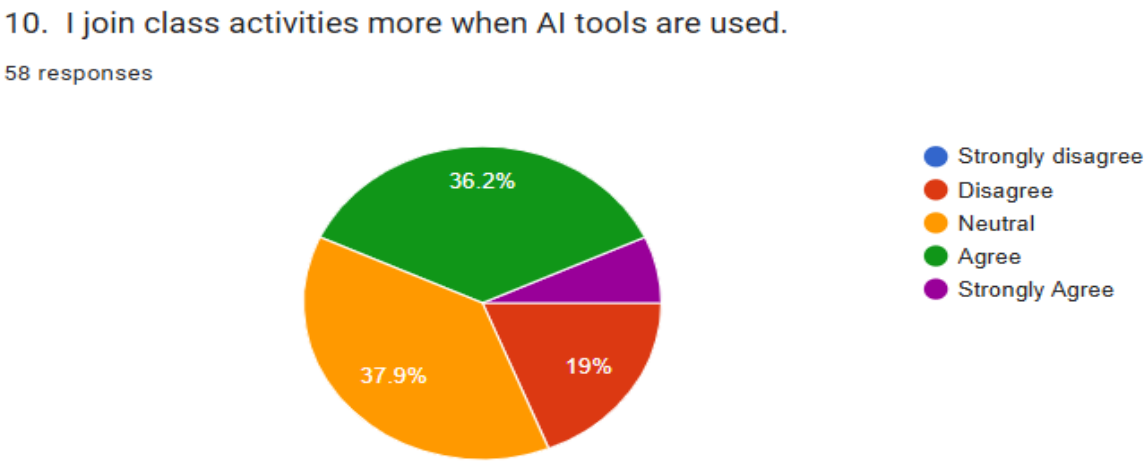

Figure 10: I join class activities more when AI tools are used

The chart shows that many students believe AI tools increase their desire to learn. About 39.7% agreed and 13.8% strongly agreed, so more than half feel motivated by AI. Around 32.8% were neutral, indicating that AI doesn't significantly affect their motivation. Only a small number disagreed. Overall, AI tools positively influence students' motivation to learn.

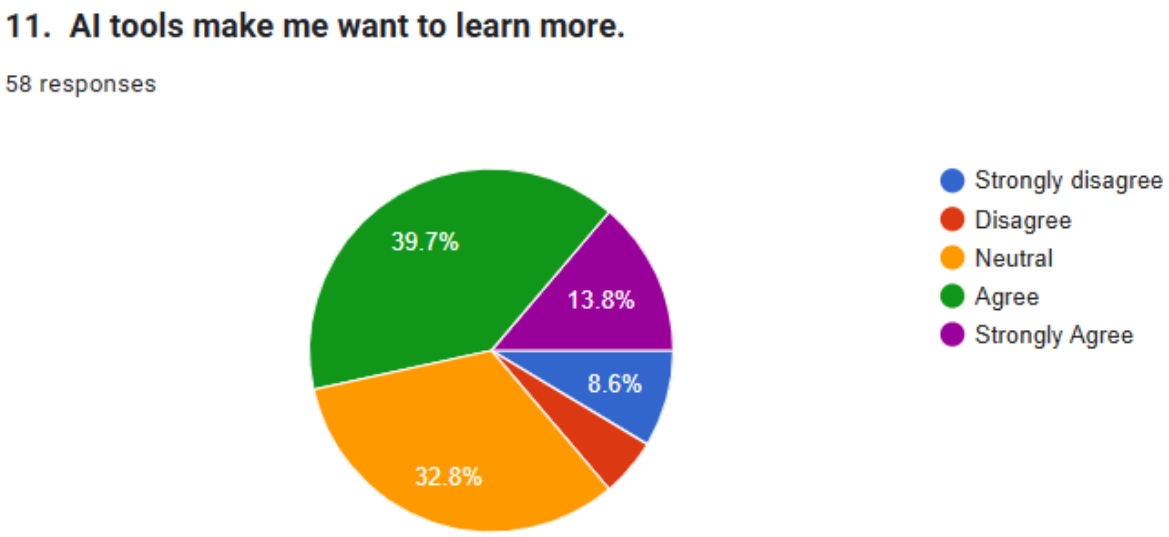

Figure 11: AI tools make me want to learn more

The chart shows different opinions on whether AI tools improve interaction with friends and teachers. The biggest group, 33.9%, is neutral, indicating that AI does not significantly change their interaction. However, 30.5% agreed and 10.2% strongly agreed, which shows some students believe AI helps them communicate better. A smaller group disagreed. Overall, the results are slightly positive, but many students feel AI does not have a strong impact on their interaction.

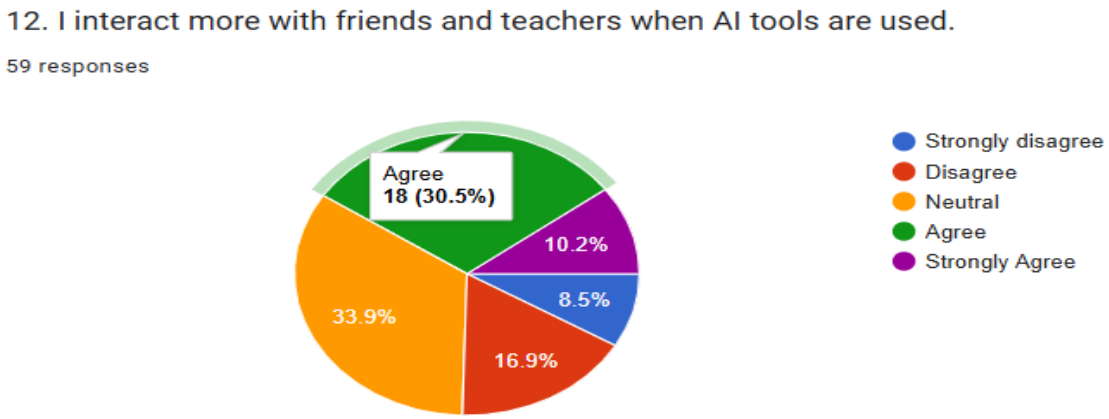

Figure 12: I interact more with friends and teachers when AI tools are used

The chart shows that many students believe AI tools help them stay more active and involved in learning. About 49.2% agreed, indicating a strong positive response. Around 30.5% felt neutral, meaning they don't notice a big change but also don't view AI negatively. Only a small group, about 17%, felt that AI does not increase their involvement. Overall, the results suggest that AI generally improves student engagement, though some students may need more experience with AI to feel the benefits.

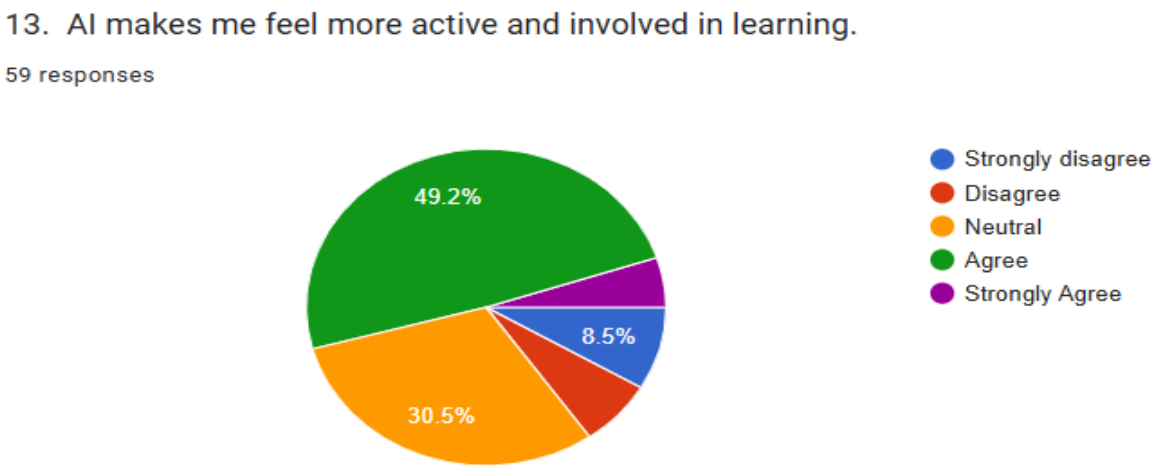

Figure 13: AI makes me feel more active and involved in learning

The chart indicates that many students believe that AI tools help them to get better marks. About 47.5% agreed and 11.9% strongly agreed, showing that more than half see a positive effect. Around 30.5% were neutral, which suggests some students are uncertain or don't notice much difference. Very few disagreed. Overall, students feel that AI helps them to get more marks.

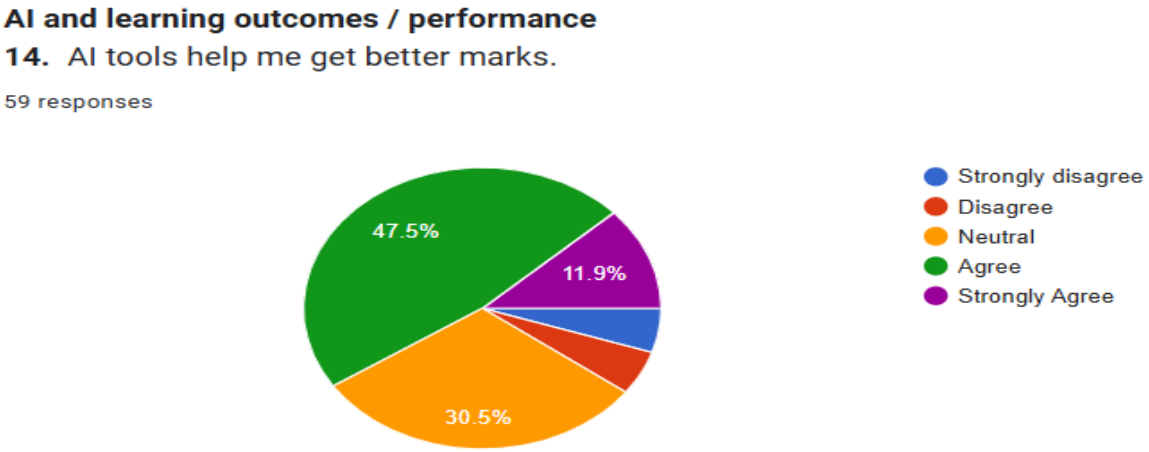

Figure 14: AI tools help me get better marks

The chart indicates that many students believe that AI tools improve their thinking and problem-solving skills. About 44.1% agreed and 11.9% strongly agreed, showing that more than half see a positive effect. Around 33.9% were neutral, which suggests some students are uncertain or don't notice much difference. Very few disagreed. Overall, students feel that AI helps them to remember lessons more effectively.

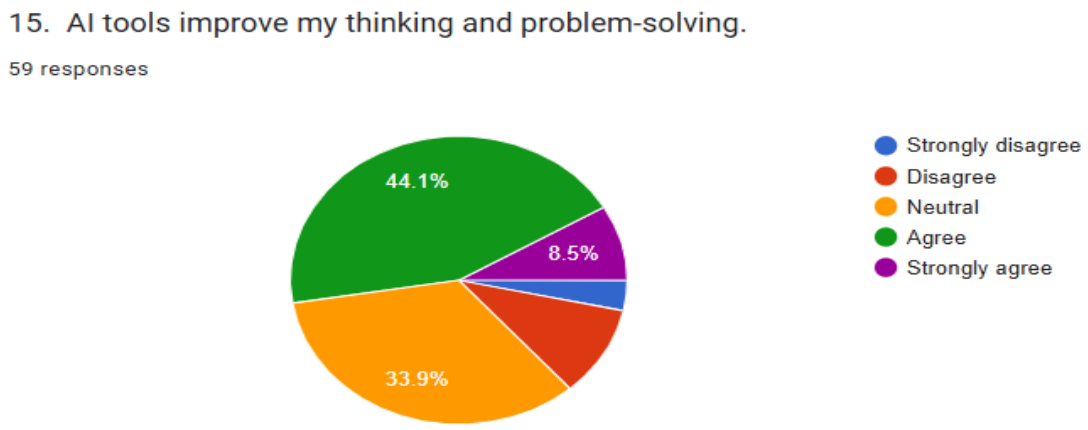

Figure 15: AI tools improve my thinking and problem-solving

The chart indicates that most students believe AI tools help them remember lessons better in their studies. About 44.1% agreed, and 8.5% strongly agreed. Around 33.9% were neutral, which means the effect is not the same for everyone. Only a few students disagreed. Overall, students see AI as helpful for improving their critical thinking and problem-solving abilities.

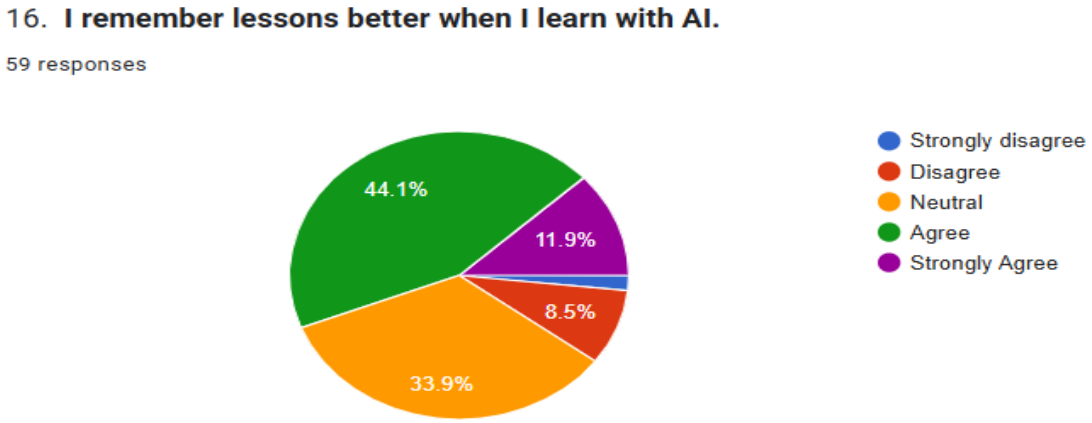

Figure 16: I remember lessons better when I learn with AI

The chart shows that many students think AI tools help their overall learning. About 35.6% agreed and 11.9% strongly agreed. However, the largest group, 37.3%, felt neutral. This means many students are still unsure about AI's full impact. Only a few disagreed. Overall, most students view AI as helpful, but still feel uncertain.

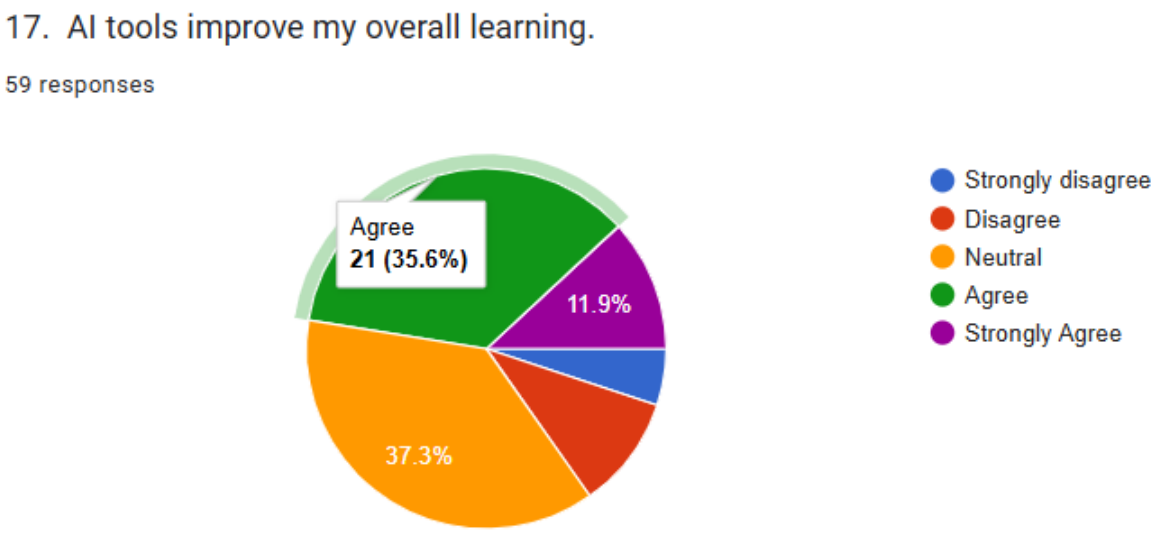

Figure 17: AI tools improve my overall learning

The chart shows that many students believe AI helps them connect lessons to real-life situations. Nearly half agreed or strongly agreed. However, the largest group, 39%, was neutral, indicating that many students are unsure or have mixed experiences. Only a small number of students disagreed. Overall, most students find AI examples useful for relating classroom learning to real life.

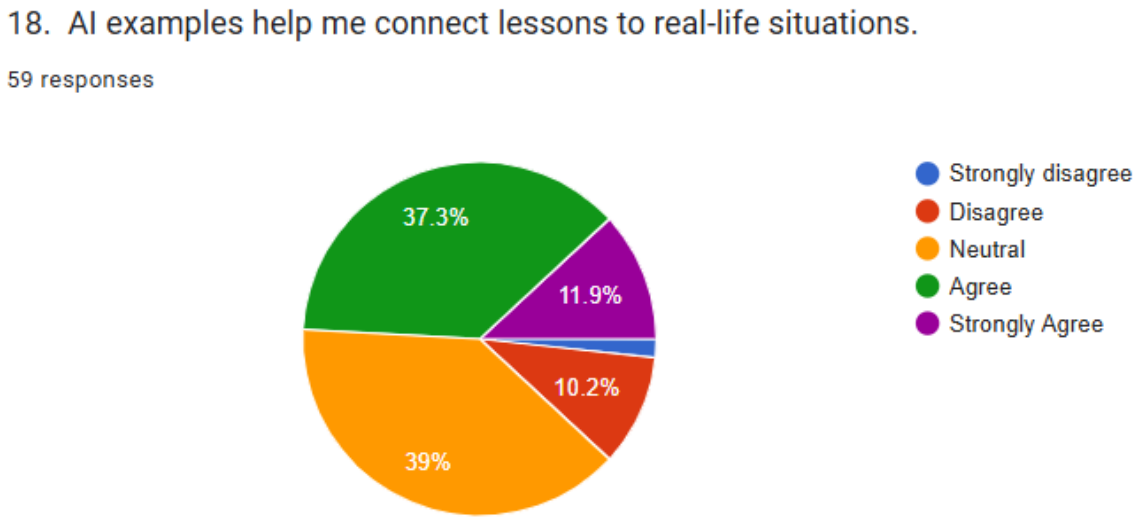

Figure 18: AI examples help me connecr lessions to real-life situations

The chart indicates that many students believe AI tools help them understand class concepts better. Around 33.9% agreed, while 10.2% strongly agreed. The largest group, at 40.7%, remained neutral, suggesting that many students are uncertain or feel AI's value depends on its usage. A smaller group disagreed, and very few strongly disagreed. Overall, students generally have a positive outlook, but many have not yet formed a clear opinion.

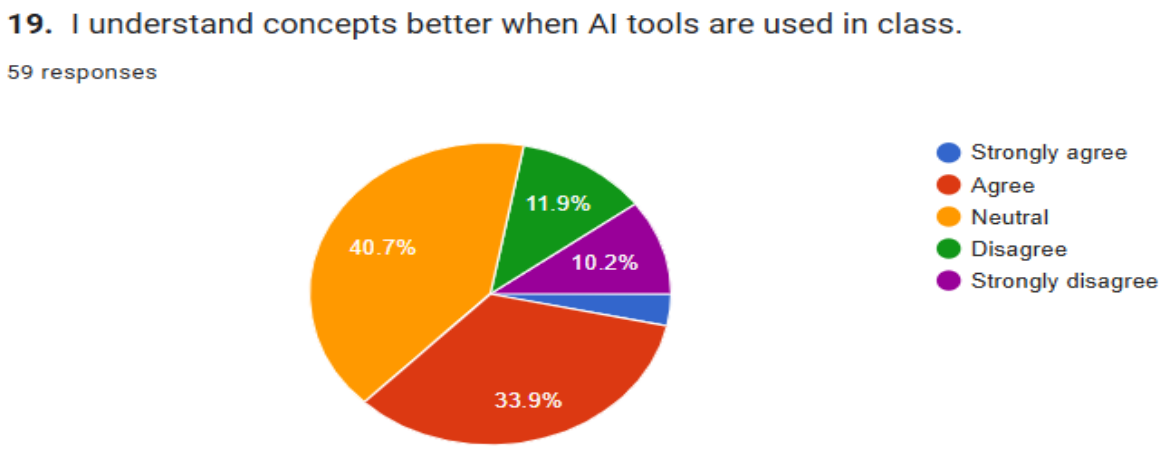

Figure 19: I understand concepts better when AI tools are used in class

The chart shows that most students believe AI helps them understand difficult topics more easily. About 45.8% agreed, and 16.9% strongly agreed, indicating solid support. Around 30.5% were neutral, meaning they are unsure or not fully convinced yet. Very few students disagreed. Overall, students typically find AI useful for learning challenging concepts.

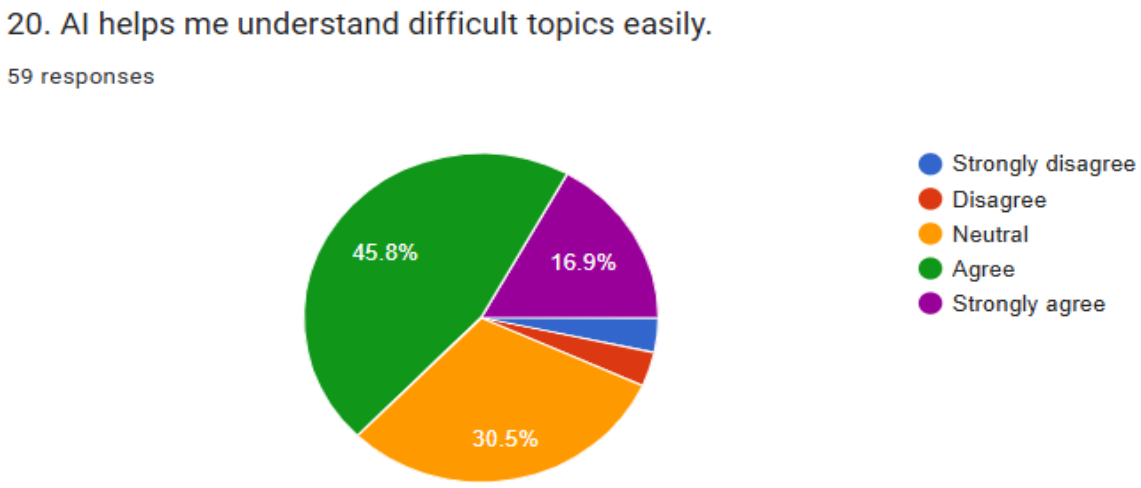

Figure 20: AI helps me understand difficult topics easily

Discussion

AI usage made the subject more interesting, motivation participation. However, some students remained neutral, indicating that engagement depends on how well AI is used. Students fared better academically with clearer explanations, better analysis, better analysis, and real-time feedback on their results through AI-powered tools. Many students found AI easy to use, although some described discomfort due to technical difficulties or fear of overdependence. More digital training is needed. Several students reported issues such as poor internet access, lack of devices, privacy concerns, and doubts about the fairness of AI. While more visually and technically oriented students adjusted to AI with ease, theoretically oriented students found it difficult due to a lack of customization in AI usage. Students developed overdependence on AI, therefore diminishing their own independent thinking. It is important that the use of AI be made in a balanced way so that critical thinking skills are maintained.

The study findings have several implications. First, Artificial Intelligence tools make the knowledge delivered more interactive and relatable to student's lives. They help students understand concepts much better. Teachers can integrate these into lessons and track student progress with AI-based feedback. Second, AI enhances students 'motivation and participation. Students will be more active and confident. Colleges

should train students on the use of AI tools comfortably. Third, challenges like poor internet access, device deficit, and issues of the policy indicate that colleges need clear policies on this. The institutions should improve the digital facilitates and introduce guidelines on safe and fair usage of AI. Last, various learners react differently to AI tools. The visual and technical needs to be al learners are benefited more. Therefore, AI tailored for each subject and learning style.

The sample size for the future research needs to include more students from different colleges. The research might compare the use and benefits of AI tools across students in different streams, such as commerce arts, and science. Longer- term studies can indicate exactly how AI influence learning and skills over time. More revealing information about students' experience of AI may emerge through interviews and group discussions. Further research is needed regarding privacy concerns, fairness, and unequal access to technology. In the future, studies can be conducted to understand how VR/XR tools help with Learning and also how discomfort is minimized.

Conclusion

This paper proves that AI tools have a positive impact on the experiential learning process for the college students. AI platforms, simulations and tutoring systems facilitated the ability to understand complex topics and engage students in the learning process. Students showed enhanced motivation, participation, and Academic achievement when using these tools properly. However, the students did not have all benefits at the same level. Some found the shortfalls in device access, unstable internet, privacy and unfamiliarity with AI tools as challenges. The visual and technical learner adapted more quickly, while a theoretical learner adapted more quickly while a theoretical learner needed extra support. These differences make a point of proper training in addition to strong digital infrastructure and guidelines for using AI safely and fairly. Overall, the findings indicate that AI has the potential to significantly enhance learning and engagement when used thoughtfully. If appropriately supported, AI hold the potential to make education for all learners more practical, accessible and future- ready.

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