TECHNOLOGY FEATURE Research Communication

AI Impact on Students' Thinking and Learning

Students worldwide are using AI for their coursework — that much everyone agrees on. What nobody agrees on is what it's actually doing to them. The research has answers. Some of those answers are uncomfortable.

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Let's Start With What Actually Happened

Artificial Intelligence or AI has seamlessly entered our educational fold. Although educators and administrators were slow to acknowledge its relevance and possibly the inevitability of its early incorporation in our students' academic pursuits, students were not as to slow to reap its benefits. This is obvious from a survey conducted by the RAND Corporation in the United States in early 2026 where it was found that 62% of students in that country utilised AI tools to complete their school assignments by December 2025. This number was a drastic departure from the 48% who professed using AI for homework in May 2025, thus experiencing a drastic leap in a matter of seven months.

In Pakistan, things are progressing at an even speedier pace because of the affordability of smartphones and the extremely low cost of data packages that our youth barely find expensive for constantly staying engaged in social media and entertainment. Under these circumstances, it is reasonable to suggest and actually look forward to the early incorporation of emerging technologies like AI in our academic environment for all students to become exposed to them on an early footing and reap maximum benefits from them.

Okay, so we used a bunch of AI this week, but the follow up questions I have are: Did this ultimately help the kids learn the material? And also: Did it limit their ability to use prior knowledge for original thought with new material? These are not exactly the same questions.

The Numbers Say AI Works. Up to a Point.

So, let's start with the good news: it is real. And it comes in the form of a meta-analysis published in ScienceDirect in 2025, which assessed 57 studies containing 97 data sets. These studies investigated the effect of generative AI on university students' learning outcomes. Based on the results, AI-assisted adaptive learning led to a 62% increase in test scores. General academic achievement increased by about 30%, and students reported a 20% decrease in study-related anxiety.

One last thing to keep in mind: Many of these tools offer tutorials and explain concepts in multiple ways. This can be a game-changer for a student who is feeling swamped, paralyzed by a assignment, or has no idea where to start. Rather than cheating, it would level the playing field

for poorer students and provide the kind of support that wealthier students already receive from private tutors.

Something curious: in studying the effects of an artificial intelligence tutoring system on students around the world, the researchers behind it found that the biggest gains actually went to low-income students in low-tech settings. Those with the least access to traditional means of helping students learn scored biggest. And AI may be one of the few technologies to actually reduce educational inequality as it becomes more widely used — an observation that should give us some hope here in Pakistan

WHAT 57 STUDIES ACTUALLY FOUND

AI-supported learning raised test scores by up to 62%, improved overall academic performance by 30%, and reduced study anxiety by 20%. The strongest gains consistently appeared in lower-income, lower-technology settings. (Chen & Cheung, Educational Research Review, 2025)

But Something Else Is Happening Too

In 2025, MDPI published the results of a study on 85 Romanian university students who were already using AI to complete assignments. The worrying sign for the future of artifical intelligence was that 48.2% of the students expressed low trust in the accuracy of the AI model's responses. More troubling, however, was the students' use of AI as a primary means to complete problems before even attempting to solve them on their own.

Learning is not about arriving at the right answer. Learning is about making errors, grappling with those errors, trying different routes, and in the end arriving at a sense of what is correct and why. When AI completes these steps for students, they can get the understanding, but without the effort and friction that truly cements it in their minds. A recent study published in Frontiers: Quality, Authentication, and Safety of Foods in 2025 provided neurological evidence of this shift. Researchers noted that students who used AI-heavy tools showed reduced activity in regions of the brain associated with analytical reasoning and memory.

Based on methodologies that align with the teaching educational process, the articles of this systematic review were evaluated for evidence concerning critical thinking abilities developed by students using ChatGPT after exposing them to a topic from different perspectives, critiquing written arguments, and revising previously written work. A total of 19 studies met the criteria of this review, and the results are encouraging: as long as ChatGPT is utilized to foster critical thinking in these ways, evidence supports growth in this cognitive skill. However, as a machine learning model, ChatGPT is typically used to complete the final step of generating an answer to a question after the thinking has occurred, and this could potentially compromise the desire for students to think for themselves over time. The findings were published in the Educational Process International Journal, which is indexed in the Education Resources Information Center database (ERIC)

Pakistan: The Evidence Is Right Here

It would be easy to read all of this as a problem happening somewhere else. It is not.

> ***STUDENT PERSPECTIVE***
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> *Honestly, I have seen this in my own university. A classmate submits a two-thousand word assignment the night before it is due — a topic they told me earlier that week they knew nothing about. The writing is clean, the structure is organised, the references look right. But in the next seminar, when the lecturer asks a follow-up question on the same material, they go quiet. The knowledge is not there because it was never built. I do not blame them, though. When you are worried about your CGPA and you have a tool that produces a passing assignment in twenty minutes, the temptation is real. The problem is that nobody told us what we were trading away.*

In recent years, there has been a growing feeling among students at Pakistani universities that AI is increasingly doing their homework for them. A 2024 study published in the Journal of Applied Linguistics and TESOL on BS English students at two public universities in Pakistan observed and analysed assignments submitted by students before and after the widespread adoption of AI, and found that assignments written in the post-AI period were less analytically robust, often relied on set formulas and phrases commonly used by language generators, and seemed to have been generated by AI rather than authored by students. A prevalent sentiment among English teachers in Pakistan is that it is becoming increasingly difficult to authenticate student work because so many of them are relying on AI to complete their assignments. And, interestingly, a major motivator behind this shift is not students' typical laziness or an insatiable desire to learn more about AI, but rather a sincere fear of losing marks on their assignments.

A survey of 489 Pakistani students at public and private universities and degree awarding institutions was conducted in 2025 for The Critical Review of Social Sciences Studies. The findings provide an optimistic outlook towards the integration of AI in educational environments as 80% of students agreed that AI can understand their needs and provide them with content accordingly, while 75% of students agreed that AI can design personalized study plans for them. However, another set of challenges emerged as 72% agreed that AI could further exacerbate the educational disadvantage faced by rural students in comparison to urban students, while 86% of students believed that their teachers are not trained to use AI in the classroom and, most concerning, 89% of the sample agreed that there should be regulations regarding AI in education enacted by government.

A 2025 study conducted in Lahore surveyed 248 students attending university to gauge the possible benefits of using AI in future education. The findings suggest that even by 2025, AI has the potential to boost academic performance, but only under specific circumstances. As the study highlights, the difference lies with the learning behavior of students. Those who continually apply what they've learned during their studies by actively using the technology are more likely to achieve better results than those who allow the AI to perform tasks that require thought for them. The study found that incorporating creativity and independence in learning utilizing the technology for enhanced performance also played a crucial role.

PAKISTANI RESEARCH — KEY NUMBERS

Post-AI student assignments at Pakistani universities showed measurably less analytical depth. 89% of surveyed Pakistani students called for formal AI policy in education. 72% feared AI would widen the urban–rural learning divide already present in the country. (Khan, JALT 2024 ; Nizami et al., 2025)

So What Should Students Actually Do?

Tools, including new ones like AI, change how we use other tools. Use AI to begin exploring ideas but not to offer final conclusions. Use AI to understand materials you don't get, but explain what you learned from memory after you've closed the AI. Use AI to test your arguments against objections, but then decide which objections are relevant to you and why. Use AI to help improve your writing, but not to write the first draft. There is a reason this is more than an ethical distinction. There is a reason you will not learn if you rely on AI to do your work for you.

The Bigger Picture for Pakistan

Pakistani students have already spoken: they want government, teachers, and equals access to quality education so that those in small towns and rural areas are not left behind in the pursuit of educational excellence by those in Lahore and Karachi. These are reasonable demands supported by evidence. The research that needs to be done is already being done in Pakistani classrooms by Pakistani students. The findings are available for those who want to use them to make informed policy and practice decisions.

Artificial Intelligence (AI) is here to stay and will not slow down anytime soon. The state of the art tools will become increasingly powerful, and pressure to use them will continue to mount. But the question remains whether or not Pakistani education institutions will frame the way in which their students use these emerging technologies, or if we will simply watch on as they unfold in the aftermath of exam results and graduating class performance. That is a policy decision which has yet to be made.

About the Author Ammara is a student researcher at the University of Agriculture, Faisalabad, with a keen interest in educational technology and the impact of artificial intelligence on modern learning environments. Her work focuses on how emerging technologies are reshaping academic thinking and student performance in Pakistan. She can be reached at ammarahashim354@gmail.com.

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