

ANALYSIS

The Role of Artificial Intelligence in shaping the future of Education in Pakistan

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"Artificial intelligence is not going to replace people, but people who use AI will replace those who don't." —
Harvard Business Review

1. Introduction

AI is a new discovery and all key discoveries in the past have changed the discourse of the globe forever: fire, the wheel, and electricity, to name a few. These discoveries have offered lot of opportunities to reshape the society. AI is another revolution going to change landscape of our globe. According to the book "The Coming Wave: A.I., Power and the Twenty-First Century's Greatest Dilemma" by Mustafa Suleyman and Michael Bhaskar, this new wave of technology benefits are vast and profound. What sets this wave apart from previous technological revolutions is its exponential nature. Historically, technological advancements were slow and steady, but this time, it is different. Four years ago, no one would have believed in the power of large language models (LLMs), and now they are ubiquitous. Within the next decade, we may see the advent of superintelligence—a point at which AI could far surpass human capabilities.¹

Generative Artificial intelligence (GAI/AI) is rapidly transforming all fields. AI could unlock the mysteries of the universe, revolutionize healthcare and education, and transform agriculture into a healthier, more sustainable industry. Unlike past revolutions that replaced manual labour with machines, AI is set to impact jobs involving thinking, writing, and decision-making.

Professions such as law, medicine, copywriting, translation, and even art and music are experiencing significant changes due to AI's rapid rise. According to Bowen and Watson, authors of the book **Teaching with AI**, there is a fundamental shift from the knowledge-scarce but reliable pre-internet era to the knowledge-abundant but less reliable post-internet era. If the internet changed our relationship with knowledge, AI is an innovation that is going to change our relationship with thinking.²

As artificial intelligence continues to reshape global industries, education stands at a critical intersection of technological innovation and human potential. This article aims to initiate a dialogue on benefiting from the new technological wave in education sector in Pakistan. How can we better use AI to prepare our future generations for better career opportunities? Specifically, we will examine how Pakistan can maximize the benefits of AI in education, focusing on practical strategies for integration, skill development, and responsible implementation.

¹ Suleyman, Mustafa, and Michael Bhaskar. 2023, *The Coming Wave: Technology, Power, and the Twenty-First Century's Greatest Dilemma*. New York: Crown

² Bowen, José Antonio, and C. Edward Watson. 2024. *Teaching with AI: A Practical Guide to a New Era of Human Learning*. Baltimore: Johns Hopkins University Press.

2. National Education System at the Crossroads

The United Nations Educational, Scientific and Cultural Organization (UNESCO) projects that an additional 44 million teachers will be needed by 2030 to fulfil the ambitious targets set forth by Sustainable Development Goal (SDG) 4, which aims to ensure inclusive and equitable education and promote lifelong learning opportunities for all.³ Sub-Saharan countries needing more than 10 million teachers by 2030 to meet ambitious SDG 4 target aimed at inclusive education. Pakistan has one of the highest numbers of out-of-school children globally, with nearly 26 million children not attending school. Those who do attend often don't have sufficient teachers.

Prime Minister Shehbaz Sharif recently declared an 'Education Emergency' across Pakistan to enroll around 26 million out-of-school children and promote literacy to make the country regain its lost space and develop it as one of the most educated societies in the world. "Today, with iron conviction, and the support of provinces, we will handle the challenge of 26 million out-of-school children. We will bring them back to school...I declare from this moment an Emergency in Education all over Pakistan...The way we did it in Punjab, we will do it in Pakistan," the prime minister said addressing the National Conference on Education Emergency.

According to the Pakistan Institute of Education report 2021-22, teacher-student ratio stands at 1:39 in primary schools, far from the ideal ratio of 1:30 recommended by UNESCO. This acute shortage of teachers alone exacerbates educational disparities, particularly in rural areas and provinces like Balochistan, where over 3,500 schools are non-functional due to a lack of educators⁴. It is estimated that Balochistan is in need of around 16,000 teachers, on top of the current strength. Since February, 2024 at least 542 educational institutions have closed down.⁵

The ability to collaborate with AI will soon be a key skill in every job. Whether in business, law, engineering, or the arts, future graduates will need to use AI as a tool for innovation and efficiency. The World Economic Forum (2023) projects that one-quarter of jobs globally will be affected due to new digital skills requirements.⁶ According to 2023 census Pakistan has 60.7% literacy rate, one of the lowest in the region. This low literacy level is concerning, especially when there is increasing demand for digital literacy in the modern job market. Labour force of countries who reskill and upskill, becoming proficient in using AI, are more likely to transition smoothly into new job roles in the world. Generative AI has potential to contribute significantly to global economy driven by increase in labour productivity and the creation of new revenue streams from product innovation.⁷ In such a scenario, those lacking digital literacy are at high risk of displacement while those who will reskill and upskill - becoming proficient using AI and digital skills are most likely to have smooth transition to new job requirements.

3. Integrating AI into the Classroom

The rise of AI offers a unique opportunity to rethink education. Instead of focusing solely on preparing students for specific careers, we should teach them how to adapt to a rapidly changing job market. AI will continue to evolve, and students will need the flexibility to learn new skills

³ United Nations, SDG4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all, 2015.

⁴ Dawn. 2023. "Shortage of Good Quality Teachers." Retrieved from Dawn Newspaper

⁵ The Express Tribune. 2023. "Education Crisis: Over 500 Schools Shut Down in Balochistan." Retrieved from The Express Tribune

⁶ World Economic Forum. 2024. Shaping the Future of Learning: The Role of AI in Education 4.0. Insight Report. Geneva: World Economic Forum.

⁷ Huang, Sonya, Pat Grady, and GPT-3. 2022. *Generative AI: A Creative New World*. Sequoia Capital.

throughout their careers. Teaching pedagogy, traditional assessments, grading among many other things might need significant change in the education sector.

Education and healthcare are areas where personalized approaches are very important because each student and patient is unique. It is hoped that generative AI can help meet this need. AI is expected to bring significant changes to all levels of education—primary, secondary, and higher education. According to Sal Khan, founder of Khan Academy, AI can address the teacher shortage by providing one-on-one tutoring tailored to students' needs, as discussed in his book "Brave New Words."

AI can now perform tasks we once thought were uniquely human—writing essays, solving complex math problems, and answering intricate questions. While this technology offers great assistance, it also presents a challenge. The objective of integrating AI into the classroom is not to make learners into AI experts. Rather, the emphasis should be on awareness, nurturing curiosity, and establishing foundational understanding. For example, teaching students how to assess the reliability of sources and discern the accuracy of information presented on websites. AI can provide material that matches students' strengths, weaknesses, and knowledge levels, aligning with educational objectives and enhancing the relevance of content for each individual learner.

AI is also changing how teachers teach. AI tools can help educators design better courses, create more effective assignments, and make grading more consistent. For example, AI can quickly analyse student work and provide feedback, allowing teachers to focus on helping students deepen their understanding. However, with AI capable of completing assignments that once required hours of human effort, traditional methods of assessment need to be rethought. Educators must find new ways to challenge students, perhaps by focusing more on critical thinking and real-world problem-solving rather than merely testing knowledge.

4. Personalized Learning

One-on-one tutoring, like the personalized education Alexander the Great received from Aristotle, allows students to learn at their own pace. One can observe that in sports there are certain general skills but without one-on-one coaching, there is hardly anyone who can achieve great milestones on consistent basis. In contrast, the mass education system that emerged in the eighteenth century teaches large groups with standard methods. While mass education has increased literacy worldwide, it often moves students forward before they fully grasp basic topics, creating gaps in their knowledge.

Educational psychologist Benjamin Bloom's research shows that personalized tutoring helps students better master subjects.⁸ The traditional fixed pace makes it difficult to address each student's unique needs, causing many to struggle in advanced areas. However, providing individual teachers to everyone is not feasible without technology. AI now makes scaling up one-on-one tutoring possible.

Marginalised and backward areas in Pakistan have also an issue to first learn in regional language, then to national and then to English. AI-powered translation and language learning tools can help overcome language barriers in education. These tools can translate educational content into local languages, making learning more accessible to students who may not be proficient in the national language or English.

⁸ Khan, Salman. 2024. *Brave New Words*. New York: Viking.

5. AI as an Enhancer, Not a Replacement

In his 2017 address at the British Science Festival, Sir Anthony Seldon forecasted that by 2027, AI would become the primary educator, offering personalized learning experiences tailored to each student's needs.⁹ While recognizing AI's potential to revolutionize education through customization and adaptive learning, some argue that AI will not replace human teachers but instead enhance their roles. Drawing on Doug Engelbart's vision from the 1960s, technology is seen as a tool to augment teachers' abilities rather than render them obsolete.¹⁰ Ethan Mollick, author of *Co-intelligence with AI*, of Wharton emphasizes that teachers will need to adapt by setting higher expectations, integrating AI into assignments, and reimagining classroom dynamics to incorporate AI as a collaborative tool. The overarching perspective is optimistic, suggesting that AI will empower teachers to build stronger personal connections with students and develop more creative and enriching lessons, thereby enhancing the teaching profession rather than diminishing it.¹¹

AI should be seen as a powerful partner in learning, not a crutch. Students must learn to use AI to enhance their thinking, not replace it. This means understanding that AI is a tool to generate ideas, ask better questions, and clarify complex concepts, but it cannot substitute human critical thinking.

If students rely too heavily on AI to complete their work, they may graduate without the essential skills needed in the real world. Imagine a student who can write only as well as an AI; this might suffice in school but leave them unprepared for a job market that values creativity, critical thinking, and clear communication. If AI can perform the same work as a college graduate, what value does that degree hold?

For educators, AI offers powerful new tools to enhance teaching and learning. AI can help personalize education, allowing teachers to focus on more meaningful interactions with students. It can assist in grading, organizing class materials, and even leading discussions. However, teachers must also guide students in using AI responsibly and effectively. Educators should not compete with AI but to help students think better and more creatively with it. Educators must find new ways to challenge students, perhaps by focusing more on critical thinking and real-world problem-solving rather than merely testing knowledge.

Role of educators is not to compete with AI but to help students think better and more creatively with it. We must teach them to use AI as a partner in their work, helping them become more productive, innovative, and successful in whatever field they choose.

6. AI Literacy as a Core Curriculum

AI literacy should become a core part of curricula across the country at all tiers of education. Just as we teach problem-solving, we must now teach students digital literacy and how to work with AI at higher secondary and tertiary level of education. At primary and middle level it can be introduced at second stage. AI literacy includes understanding its capabilities and limitations, knowing how to ask the right questions, and learning to critically evaluate AI-generated responses.

7. Challenges and Ethical Considerations

Integrating AI into education comes with challenges. There are concerns about equity as already privileged students with digital access will have better opportunities to benefit from it. Its like

⁹ Seldon, A. 2017. "The Fourth Education Revolution." British Science Festival Address.

¹⁰ Engelbart, Douglas C. 1962. "Augmenting human intellect: a conceptual framework."

¹¹ Mollick, Ethan. 2024. *Co-Intelligence: Living and Working with AI*. Portfolio

private vs public schools. How to overcome this challenge needs special attention from policy makers to invest in digital infrastructure and make it available to all at the earliest.

Moreover, there is a risk that reliance on AI could widen the digital divide. Not all teachers and students have equal access to technology, and those without internet access may fall further behind. Efforts must be made to ensure that all students can benefit from AI-enhanced education, regardless of their socioeconomic background. Access to internet is important to benefit from the Generative AI.

The Importance of Human Interaction is another important concern specially in early years of education. As mentioned earlier while AI can enhance education, it cannot replace the human touch that teachers provide. Emotional intelligence, empathy, and the ability to inspire are qualities that AI cannot replicate. Teachers are very important for guiding students, helping them think critically, and teaching them how to work together—things that AI cannot do yet. They also support students in dealing with personal and academic problems. AI should be seen as a tool to help teachers, not replace them.

8. Policy Implications

Policymakers need to understand how important AI is in education and how to harness this technology. There is an urgent need for National AI policy in education sector at all levels of education besides having changes in regulatory framework and investment in infrastructure. Since customising AI for our own students require investment and human capital from the private sector, therefore, there is need to develop a public-private partnership.

Governments have to invest in teachers training programs and update educational curricula to include AI literacy and digital skills.

AI offers a unique opportunity to close the gap between privileged and underprivileged classes. To achieve this, stakeholders must work together to remove digital inequalities at the earliest, besides developing customised AI tools to meet our needs for students of backward areas.

9. Conclusion

As AI continues to transform the global landscape, our education system must adapt to prepare students for the future. AI offers a viable solution to many of the challenges faced, from teacher shortages to enhancing the quality of education. By integrating AI thoughtfully and responsibly, we can equip our youth with the skills needed to thrive in a rapidly changing world.

Last, but not least policy makers have to focus on development of customized AI tools as per our national and local requirement to benefit the most from this new wave of technology. By focusing on our unique challenges and opportunities, we can harness AI's potential effectively. The goal is to prepare the next generation not just to coexist with technology but to lead and innovate in a rapidly changing world.