

## AI in Education: Visions, Challenges, and Strategies for Tomorrow

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The incorporation of Artificial Intelligence (AI) in educational systems signals a transformative phase in teaching and learning methods. In the presentation we examine the interplay between AI developments and educational practices, envisioning how this synergy might unfold in three future contexts. In one scenario, where AI capabilities expand gradually, we foresee AI augmenting education, as seen with examples like Khanmigo – Khan Academy's virtual tutor. Recent advancements in Large Language Models highlight AI's potential as an adaptive tutor, capable of tailoring educational content to individual learners' preferences and needs. This opens possibilities for personalized learning, potentially revitalizing traditional teaching methods and aligning education more closely with the needs of a workforce increasingly shaped by AI technologies. However, this prospect raises ethical concerns, particularly regarding the use of AI in early education, where its impact on young minds and cognitive development must be carefully managed. Alternatively, a rapid leap in AI capabilities could fundamentally challenge our current educational structures, with AI excelling in both curriculum customization and teaching, potentially outperforming human educators. Here, we explore how educational systems might adapt to remain relevant and effective in the face of such swift AI advancements while also considering the potential psychological and societal risks involved. The third scenario explores the concept of technological singularity, envisioned as a moment where technological advancement accelerates uncontrollably, leading to profound and unpredictable impacts on humanity. Identifying common threads in all these scenarios is essential to promote a deliberate and mindful integration of AI in education, ensuring that technological progress is in harmony with human ethics and values. The integration of AI in education is inevitable, but its direction is not preordained. Our presentation aims to examine possible directions for AI in reshaping education. We advocate for extensive experimentation with AI applications within educational settings, underscored by innovation and a firm commitment to student welfare and ethical considerations. This includes empirical studies involving pilot programs and longitudinal research, with educators, technology experts, and policymakers engaging in proactive, long-term, and inventive discussions. Our objective must be to ensure that the future of education is not only technologically proficient but also ethically responsible and centered on human development and values.