

# Can AI Help Improve Learning Outcomes at Scale?

[G. Sabarinatha](#)

*For all its many interesting insights, Khan Academy founder Salman Khan's new book, 'Brave New Words: How AI Will Revolutionize Education', overlooks the many potential areas of concern in deploying LLMs.*

Khan Academy founder Salman Khan's book, *Brave New Words: How AI Will Revolutionize Education (and Why That's a Good Thing)*, is an exploration of the ways in which artificial intelligence, especially large language models (LLMs), of which Chat GPT is a popular example, can be deployed to transform the way education is produced, distributed and consumed. The narrative is essentially built around Khanmigo, an application that Khan and his team built on top of Chat GPT-4.

Khan probably needs no introduction. With Khan Academy, he revolutionised the use of technology to deliver high quality learning at scale. The book describes how Khanmigo could engage with the various stakeholders in secondary and higher education – teachers, parents, learners, policy planners, officials in charge of admissions in universities, testing agencies and, not to forget, those who fund these activities.

The structure of Khan's narrative in the book is interesting. He describes briefly how each of the facets of education are currently managed – pedagogy in different disciplines, testing, student-teacher engagement, the role of parents and the admission processes. He then proposes how the adoption of AI can improve the processes, using Khanmigo as an example. The book thus serves as a quick, even if highly simplified, review of extant practices in secondary and higher education.

Divided into nine parts, the book discusses the use of AI in the pedagogy of social sciences, natural sciences and mathematics by providing examples from each of the disciplines. The examples are accompanied by transcripts of the actual chat on Khanmigo, which give the reader a picture of what transpires while using the app.

## **Production and consumption of education in the LLM world**

A few common features emerge from these examples and the accompanying transcripts. One, the app engages with the user in a Socratic process. Second, the app mimics a highly capable and creative human tutor, who is not just aware of the capabilities and inclination of the student, but also draws on the past engagement with her. Third, the app has the

pedagogic versatility to teach disciplines as varied as literature, history, maths and science, each of which requires highly different approaches.

Khan argues that thanks to these features, LLMs can address the shortcomings of the contemporary approach to learning where everyone in the class is subjected to the same pace of learning. Both fast and slow learners are equally dissatisfied with the current approach, which assumes a certain median learning ability. For the slow learner, the current approach leads to a growing cumulative learning deficit, all the way up to college, with all its attendant consequences that have been widely documented.

### **Impact beyond pedagogy**

By improving the productivity of teachers and bringing the learning experience close to high quality personalised tutoring, Khan believes that LLMs can potentially resolve a huge crisis enveloping the education sector across the world – the shortage of capable teachers and teaching assistants.

Khan also makes a case for leveraging AI to improve learning outcomes for the underprivileged sections of society, at scale, thereby reducing inequality in access to quality education across the world. This has been his mission at Khan Academy.

The book describes how AI can serve as a coach for students as a non-interested third party, facilitating a conversation between parents and children, improving the testing process by making it more continuous and by providing instant feedback, making it almost a seamless part of the learning process. Khan proposes ways in which AI can remove the subjectivity in the process of selecting students for prestigious universities.

### **Generous to faults?**

Khan's belief in the power of AI is unstinting. Two lines bear out the depth of his conviction. "It (AI) is the trusty wingman that tackles the boring stuff, sparks creativity, supercharges lessons and helps educators craft unforgettable learning experiences that light up student's minds." He concludes by calling for what he refers to as "educated bravery". He writes, "Let us use AI to create a new golden age for humanity, a time that will make today look like a dark age."

For all its many interesting insights, the book's treatment of the many potential areas of concern in deploying LLMs is inadequate. Khan acknowledges worries such as misuse of private information about users that could be gathered while engaging with LLMs, biases and subjectivity that could creep into them and unhealthy influences on young users. But he deftly dismisses them by either pointing out that those concerns also plague the alternate methodologies currently in use, as in the case of college admissions, or by suggesting that guardrails could be set up against such possible abuse.

Chat GPT 4.0 is a quantum improvement in the use of LLMs and AI. It is a powerful tool that gets more versatile all the time, even as it gets deployed. That said, its application is still at an early stage. To that extent, one wishes Khan's pitch for the use of AI in education was more balanced, taking on board the many hitherto unknown or underappreciated challenges in its deployment. That would have made the case for a broader adoption of AI in higher education even more persuasive.

*G. Sabarinathan teaches at the Indian Institute of Management in Bangalore.*