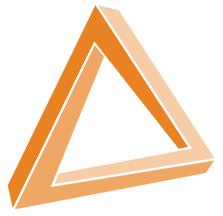


Byte-sized edtech research



What is the future of AI in education?

Luckin and Cukurova's intelligent approach to AI in education and training



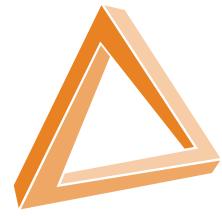
- AI can augment learning and teaching with real-time, personalised recommendations and feedback.
- Intelligent Tutoring Systems (ITS) use AI techniques to simulate one-on-one human tutoring; they can select appropriate tasks and support students to learn how to complete them.
- AI should complement and support human educators, not replace them.
- Exams excel at assessing numeracy and knowledge but fall short in assessing creative problem-solving, empathy or collaboration. Exams are a great task for AI and AI systems get better and better at exams.
- Well-designed and applied AI can contribute to creating 'a fairer, richer assessment system' (Luckin, 2017).

"You can't guess where mind-amplifying technology is going unless you understand where it came from."

Rheingold, 2000

"Education must become more efficient... In any other field, a demand for increased production would have led at once to the invention of labour-saving equipment."

Skinner, 1961



01 The potential of AI in education

Most formal classrooms are based on an outdated, industrial-age model, with students learning in heterogeneous groups, generally organised by age, progressing towards standardised assessment criteria.

This structure poses challenges to the individual learner. AI can help. Unlike (human) teachers, AI can scale easily and quickly, calculating on-the-spot personalised patterns or providing targeted feedback. AI can adapt in real-time to the dynamically changing needs of the learner.

Professor Rose Luckin argues that AI-enhanced education (AIEd) research should be reflected in three types of computational models: the pedagogical model exploring teaching methods; the domain model exploring subject knowledge; and the learner model exploring the attributes of the learners (Luckin et al., 2016).

Conclusions: AI can be used to augment personalised and adaptive learning, and in Intelligent Tutoring Systems (ITS). Luckin and Cukurova suggest tackling educational challenges using AI while prioritising human intelligence and educating people about AI (see infographic).

02 AI in communication and language-learning

AI-based translation technologies empower learners to consume high-quality content.

For example, technology can produce real-time subtitles for lecturers, and companies such as alelo.com provide languages and culture education driven by virtual role-play.

AI could also be used to help students with their writing. Academic Writing Analytics (Gibson et al., 2017) uses a web-based system to provide formative feedback.

Conclusions: AI is already used valuably in targeted areas of education.

03 Supporting educators

AI is often perceived as a threat to human roles, such as teaching.

In 1924, Professor Sidney Pressey invented a device to 'teach' students, offering multiple choice questions and revealing the next question when they click on the right answer. Automating teaching has since informed ITS, such as SCHOLAR (Collins et al, 1975). On the

other hand, Intelligence Augmentation (IA) (van Emden, 1991) aims to complement humans. Reflecting on an AI Teaching Assistant, Luckin and Holmes (2017) note the uncompromised role of the teacher, who harnesses 'AI to tailor... education to each of her students'.

Conclusions: In education, it may be less productive to develop machines to be 'like humans' and instead develop systems 'for humans'.

04 Augmenting assessment

Watson (2017) describes exams as 'memory tests', which promote 'the idea that every problem has a right answer'.

Exams excel at assessing numeracy and knowledge but fall short in assessing creative problem-solving, empathy or collaboration (Luckin, 2017b). They reward certain skills and subjects, and a certain type of student. However, systems such as competency.ai, which monitors the

progress of medical students, hail a new approach. AI is already used for plagiarism detection, to provide real-time, personalised feedback to students (Santos et al., 2012; www.ontasklearning.org; Pardo et al., 2018), and to identify misconceptions (Nye et al., 2014).

Conclusions: Exams test machine intelligence instead of celebrating human intelligence. Non-cognitive skills differentiate us from machines.