The Role of Artificial Intelligence in the Future of Education

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Dear Editor,

It is arguable that Artificial Intelligence (AI) is currently one of the hottest topics in technology. It is the subject of significant attention at technology conferences around the globe, and with the attention comes an increasing call to action for organisations across all industries to adopt a strategy towards AI implementation (1). Like any other new disruptive technology, there is a corporate race to lay groundwork, maintain market relevance, and keep up with the competition. The education sector is no exception to this, with current research predicting a 47.5% increase in the use of AI in education by between 2017 and 2021 (2).

There are many potential applications of AI in the education sector. AI can be used to automate or assist administrative work such as admissions and enrolment, and course-related tasks like grading and assessment. However, most experts agree that the impact AI will have on the future of education will likely extend beyond automation of existing teaching and learning processes, and will allow the development of intelligent learning systems that are able to adapt to best suit student requirements (3).

In 2020, we are likely to see a significant amount of AI and automation advance within the education sector. Applications of the technology include addressing accessibility and remote learning, developing more immersive and interactive learning approaches, customising and personalising education based on student requirements, and development of 'smart' schools through automation.

One of the basic human rights is the right to education. However, accessibility has always been a great challenge to this, given the limitations of remote learning programmes. With the increase in global online connectivity and the development of AI, quality education through remote learning is constantly improving (4). AI-based language translation also plays a major role in reaching indigenous groups in third-world countries and providing material in users' own language.

Interactive and immersive learning methods have been in development for several years now, with virtual and augmented reality applications being used to improve student engagement, and as a result enhance learner achievement (5).

One of the biggest challenges in education has always been catering to different learning styles and speeds. Advances in AI are presenting opportunities for personalised and customised teaching methods. China has taken significant steps in this direction through an organisation called. Squirrel (http://squirrelai.com), an AI tutoring system specialising in mathematics. In 2019, an estimated US$1 billion was invested in developing AI-based teaching and learning systems in China. As a result, the number of students using Squirrel's AI system is now in the millions.

The system assesses a student's existing level of knowledge, and through a series of tests can determine strengths and knowledge gaps, customising a curriculum specifically for the student. As the students progress through this curriculum, the system updates and adjusts material to suit their progress. It also recognises patterns and trends among multiple students, and can improve the way material is presented based on its success (6).

While most agree that the current developments in AI look promising, there are numerous challenges to overcome. The competition-fueled rush into AI could result in a trend of standardised learning. There also needs to be focus on developing AI strategy for education. There are also significant ethical concerns with the use of AI in this context, particularly around testing and development, and initial trials of more complex systems. Since AI systems are refined through mass data collection, the obvious ethics question is what type of student data is acceptable to be collected, and what measures need to be taken to protect student privacy (7). There is also the issue of algorithmic bias –unconscious bias at human level being 'coded' into AI systems – resulting in AI systems that are inherently biased.

In the near future, advances in AI will allow development of intelligent tutoring systems that could be available full-time, and could deal with thousands and even millions of students at the same time. The education publishing company Pearson has suggested a lifelong AI companion for students that will know strengths and weaknesses, and will be able to suggest study fields and career paths based on a student's academic ability or personality (8). Students needing assistance will no longer need to email a tutor, waiting sometimes days for a reply, instead they will be able to ask a virtual teaching assistant and receive instant replies. Facial and gesture recognition will be able to assess a student's level of attention, and understand when they need a break to make sure they are in the best position to retain knowledge. AI can be used to create smart content – digitizing guides for course textbooks, summarizing content for revision and developing revision exercises.

While there is still much work to be done on refining systems and approaches, the long-term future of education is exciting. It is hailed by many as exactly what our traditional education system needs, and will help provide every student of any skill level and ability with the best opportunity for success.

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Conflict of Interests

The authors declare that they have no conflict of interests.

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