Horizon Scanning Series

The Effective and Ethical Development of Artificial Intelligence: An Opportunity to Improve Our Wellbeing

Education and Training Pt 2

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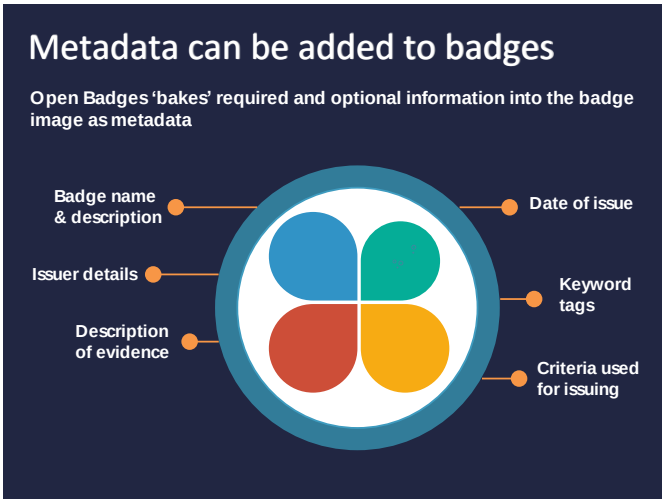
Micro credentials

Micro-credentialing is a way of certifying learning outcomes within an institution through online social networks and other mainly Digital and Online course platforms. MOOCs often use micro-credentials (e.g. Coursera). The main obstacles to their use are posed when an instruction micro-credential system starts to become obsolete or is no longer helpful to the learning. For micro-credentials to work well and maintain their value, there needs to be a healthy ecosystem of use, where there are employers and networks looking for competence-based skills, an easily updatable credentialing system and students who want to engage in gaining the credentials. Without this ecosystem it is hard for the credentials to have an extended life. One area of. increased appetite to permit permanent credentialing is through Blockchain technology. For example, open source university (https://os.university) is using blockchain technology to enable permanency of credentials and to ensure privacy and security. There is a possibility for the future that we may see tokenization of a 'coin' to be used on this sort of platform based on the hypothesis that tokens will increase learners' motivation and reduce the number of people who currently dropout from digital courses.

Micro-credentialing is also a way of certifying personalised learning and peer review to achieve an educational certification. Digital promise in the US has launched a powerful scheme of micro-credentialing for educators, for example:
https://digitalpromise.org/initiative/educator-micro-credentials/

Digital Badges are micro-credentials

Digital badges are granular, verifiable records of achievement and can be thought of as a "micro-credential". They offer a mechanism for valuing skills gained outside formal learning contexts. LMSs such as Blackboard, Moodle, Canvas etc. have piloted use of badges in many disciplines and levels. Open Badges go one step further allowing skills, interests and achievements to be verified by attaching information to the badge image file, hard-coding metadata for future access and review.



Vocational training and lifelong learning

At the moment the sectors most impacted from AI are the sectors where large amounts of money have been invested in AI technologies. These are sectors where the ability to process large amounts of data to identify patterns and relationships are the core of what is required. Processing patient and treatment data for medical diagnosis, finding specific information from millions of documents in the legal profession or recognizing the identity of a person and their right to enter a country. Unfortunately, vocational education is not generally well financed and has not seen investment in AI technology. Some of the same types of AI technology that are being developed for the schools and university sector may also be appropriate for vocational education. In terms of vocational training and lifelong learning in the workplace, then there is traditionally greater potential investment in these sectors. However, currently the available examples are limited and consist for example of: the use of recommender systems such as filtered (https://learn.filtered.com/home) being used by corporate clients, such as the NHS and the UK post office for employee training to help make best use of existing company training materials; or specialist training such as that provided to the US armed forces by alelo.com, see for example: https://www.alelo.com/products-and-solutions/.

Special Educational Needs students (SERND)

One area that might also be worth exploring is the benefits of AI when applied to the education of SEND students. There are a range of ways in which artificial intelligence can be used to support the education of students with special educational needs. For example, the use of natural language processing to enable the development of voice activated interfaces can be helpful for students with physical disabilities that restrict their use of other input devices, such as keyboards.

The combination of artificial intelligence and other technologies such as virtual and augmented reality can help students with physical and learning disabilities to engage with virtual environments and take part in activities that would be impossible for them in the real-world.

Virtual reality becomes 'intelligent' when it is augmented with AI technology. AI might be used simply to enhance the virtual world, giving it the ability to interact with and respond to the user's actions in ways that feel more natural. Or, drawing on Intelligent Tutoring Systems, AI might also be integrated to provide on-going intelligent support and guidance to ensure that the learner engages properly with the intended learning objectives without becoming confused or overwhelmed. Virtual pedagogical agents might also be included, acting as teachers, learning facilitators, or student peers in collaborative learning 'quests'. These agents might provide alternative perspectives, ask questions, and give individualised feedback. In addition, intelligent synthetic characters in virtual worlds can play roles in settings that are too dangerous or unpleasant for learners. For example, FearNot is a school- based intelligent virtual environment that presents bullying incidents in the form of a virtual drama. Learners, who have been victims of bullying, play the role of an invisible

friend to a character in the drama who is bullied. The learner offers the character advice about how to behave between episodes in the drama and, in so doing, explores bullying issues and effective coping strategies.

AI can also help EdTech applications be more flexible, though, for example, deployment online, meaning that they can be available on personal and portable devices within, and beyond, formal educational settings. The way that AI enables technology to be personalised to the individual needs of a learner can also make it beneficial for learners with special educational needs.

Examples

1. The group called DoIT at the University of Washington (State of Washington) has been researching how to make every document on the internet available to people with Special Needs. They have also begun to use AI. Click here.

2. AI is being used with students who have ADHD disability in work being done at Athabasca University. The long-term goal of this work is to develop an AIED (learning analytics) system that a) detects ADHD earlier than current models, b) improves the quality of diagnosis of ADHD c) educates instructors about methods that are effective for teaching students afflicted with ADHD, d) formatively and observationally measures competency improvements and challenges of ADHD students) engages/encourages ADHD students to study in an environment filled with anthropomorphic pedagogical agents. See: https://journals.colostate.edu/analytics/article/view/131.

3. Guiding Technologies: A Temple University spin-off based on NSF funded research is conducting intensive trials to use AI-enabled software to overcome problems in delivering Applied Behavior Analysis (ABA), the gold standard in treating developmental delays due to autism spectrum disorder (ASD) and intellectual challenges.

4. A range of work with people who have autism spectrum disorder. For example, using Pedagogical agents and personalized learning: https://link.springer.com/chapter/10.1007/978-3-540-27817-7_28

5. Systems that Leverage Big Data to help individual learners can also address special needs requirements. See for example, work with then Study software system at Simon Fraser University