Current Issues in Emerging eLearning

Volume 6 | Issue 1 Article 8

11-12-2020

Notes on Artificial Intelligence

Brian Meyer
Rocky Vista University, College of Osteopathic Medicine, brian.meyer.2025@gmail.com

NOTES ON ARTIFICIAL INTELLIGENCE

Brian Meyer

(*Rocky Vista University, College of Osteopathic Medicine*)

From leveraging insights in data-driven marketing, to utilizing machine-learning algorithms for medicine, artificial intelligence has provoked an unquestionable revolution in industry and technology that is promising to have an increasingly significant impact on the educational sector (Langley, 2019). In a traditional classroom, it can certainly seem challenging to provide individualized, student feedback; yet AI technologies assist the teacher to ensure that students with learning difficulties are catered for, so that they can actively engage with a subject. Furthermore, if additional input is needed, AI technologies could possess the capacity to provide it; they can offer a summative assessment of students' relative strengths and weaknesses, as well as data-driven insights on the best way to proceed in order to acquire a sufficient understanding of a topic (Luckin, 2017). Here we explore the potential for the integration of AI technologies in the classroom to customize the learning experience through data-driven insights, to facilitate a more efficient allocation of resources, and assist educators in the critical appraisal of their pedagogical approach in order to assess its current efficiency.

In higher education today, there has been a marked transition from didactic, top-down approaches (with the teacher commandeering the class), towards a pedagogy that invites active engagement from students, and promotes inter-contextual links between subjects, in order to facilitate understanding (Collaço, 2017). The advent of AI in the classroom has enabled educators to utilize the technology to raise pertinent questions not only in relation to its use, but also in respect of perennially popular debates concerning ethical contentions. As Nasserghodsi (2017) points out, the rhetoric concerning AI can provide a veritable source of classroom polemic that elicits active, student-led learning through critical inquiry that consolidates the correlation between taught concepts, and real-world application; a vital imperative in higher education, where facilitating the transition from schooling to work remains the pedagogical prerogative for staff.

Moreover, concentrated critique of AI also engenders responsible respect of its usage; as with all technologies, it has both the power to enhance the learning experience, as well as produce possibly avoidable and unnecessary risks to involved stakeholders (Zanetti et al., 2019). 'With A.I, we're dealing with a system that is faster and more capable than us by orders of magnitude.' Bossman (2016) notes that "The more powerful a technology becomes, the more it can be used for

nefarious reasons as well as good." Despite the popular misconceptions of AI consolidated through cultural forms, such as films and novels, its potentialities for both personal and societal transformation should not be undermined. The insights yielded through AI are invaluable in order to create a future-oriented educational environment that takes maximum advantages that this particular branch of technology has to offer (Han, 2018). Although AI technologies have the capacity to be used for nefarious ends, by introducing both students and teachers to their potentialities in practices, the fears surrounding their adoption are likely diminished as one becomes able to view them as a tool for improving utility, rather than as a domineering, malevolent force to contend with, as suggested in popular media today. Indeed, it is not AI technologies themselves that are a cause for contention, but instead, the integrity of the intention behind them. If used for the appropriate ends, they have the capacity to enrich the learning experience immeasurably to accommodate a variety of sensory styles.

In higher education today, resources are increasingly stretched; at times, class numbers far exceed teaching capacity, posing persistent challenges for educators to accommodate student needs on an individual basis in the limited class time available. Yet by assimilating AI into educational practice, lessons can be adapted in accordance with data-driven insights on student particularities, allowing for a far more individuated, educational experience, as theorist Bull elaborates: *An artificially intelligent cyber tutor will constantly read, analyze, and adapt learning experiences to maximize learner interest and progress.'* (Bull, 2018.) Instead of providing generic instruction, AI collates and compiles data in order to tailor the learning experience to accommodating a student's, specific strengths to facilitate understanding and actualize these aptitudes through immersive activities. As a result, the process of learning becomes far more intrinsically motivating for the student concerned; rather than compare their level of competence with that of their peers, the personalization of the learning experience through AI implementation encourages pupils to evaluate their own past and present performance instead, providing a far more realistic portrayal of what is achievable in relation to their own aptitudes and level of learning.

While the adoption of AI technologies affords advantages in terms of streamlining system processes, concerns have been raised over the limits of these technologies to provide a holistic educational experience. One common concern is that although they provide insights on *what* individual students need to improve, they fail to sufficiently address the contributory causes for students' struggles with learning. Indeed, teachers' interpersonal skills are just as vital to success in their profession as the practical competencies they possess. Difficulties with learning are not always due to a failure to grasp taught material; students may have challenges within their home life that are impacting their ability to learn. Yet at their current

level of development AI technologies are unable to offer these vital, psychological cues. However, despite these perceived limitations. Nevertheless, AI has shown promise as a dynamic technology that can supplement and blend with traditional teacher-focused learning (Holstein et al., 2019).

In order to remain effective in teaching, it is imperative that teachers take the time to critically reflect on their current pedagogical practice. In this respect, AI can provide an invaluable tool; algorithmic updates enable a teacher to ascertain whether the majority of students understand taught topics, as well as where gaps in learning exist so that they can refine their future approach in light of these insights (Lynch, 2017.) For teachers today, time restraints make it inherently challenging to thoroughly evaluate every lesson in sufficient depth; although the success of previous lessons can provide a good summation of what tends to work, each class tends to vary in respect of the abilities and needs of learners. Through the use of A.I, generic presumptions about what works and what requires adapting are replaced with concrete insights about specific topics that need further unpacking, and whether the current methodology is aligned with the specific needs of the students (Colchester et al., 2017).

Yet as AI technologies become ever more sophisticated in its ability to improve pedagogical practice, there is increasing concern over whether current roles will be made obsolete; teachers could feel increasingly concerned over the security of their current role in light of technological progression, with the fear that they will be supplanted with AI driven tutors who are competent enough to act as a standalone replacement. Although this is a legitimate cause for concern, it should be stressed that soft skills, such as emotional intelligence, cannot be easily replaced by robotics. Consequently, the development of these invaluable aptitudes should be actively cultivated through education, in order to give students the edge as they enter the world of employment. Lee (2017) asserts that "Part of the answer will involve educating or retraining people in tasks AI tools aren't good at. Artificial intelligence is poorly suited for jobs involving creativity, planning and cross-domain thinking."

While such concerns are understandable, AI technologies appear to run very little risk of supplanting the role of the teacher; they merely provide invaluable insights that can be utilized for the educator's advantage, with the teacher providing the additional social and emotional intelligences needed to meeting the needs of their students (Holstein et al., 2019). Indeed, teachers tend to build up a distinct rapport with their students over the years; the aim of AI is not to destroy such bonds, but simply as a tool to be used in tandem with current teaching methods to make the role of the teacher more manageable in an era where additional, administrative

demands and paperwork take time and resource away from teacher and student interactions, and the opportunity for more one to one sessions for feedback.

For now, the use of AI in educational contexts remains largely process orientated; the data driven insights it deploys improve efficacy, afford the ability to customize learning, and additionally, afford teachers more one to one time with their students by streamlining administrative processes that take resource away from achieving this aim. Additionally, the insights AI technologies afford also assists teacher with the critical reflection necessary to facilitate their professional development ensuring that they continue to deploy the best pedagogical practices within their lessons. Whilst concerns over A.I's potential to supplant teachers is understandable, the level of social and emotional intelligence needed to become an effective teacher is beyond the capacity of these machines, and, as such, should not be seen as a threat to their roles but perceived, instead, as an invaluable tool to be assimilated into the current approach, rather than viewed as a viable means to supplant it.

References

Bossmann, J. (Oct 21, 2016). *Top 9 Ethical Issues in Artificial Intelligence*. Retrieved from: https://www.weforum.org/agenda/2016/10/top-10-ethical-issues-in-artificial-intelligence/

Bull, B. (May 31, 2018). *How A.I. Will Transform Education & Why Now Is the Time to Start Preparing for It*. Retrieved from: http://etale.org/main/2018/05/31/how-ai-will-transform-education-why-now-is-the-time-to-start-preparing-for-it/

Colchester, K., Hagras, H., Alghazzawi, D., & Aldabbagh, G. (2017). A survey of artificial intelligence techniques employed for adaptive educational systems within e-learning platforms. *Journal of Artificial Intelligence and Soft Computing Research*, *7*(1), 47-64.

Collaço, C. M. (2017). Increasing student engagement in higher education. *Journal of Higher Education Theory and Practice, 17(4).*

Han, L. (2018, December). Analysis of New Advances in the Application of Artificial Intelligence to Education. In *2018 3rd International Conference on Education, E-learning and Management Technology (EEMT 2018).* Atlantis Press.

Harris, R. (2018, May 30.) *For Some Hard-To-Find Tumors, Doctors See Promise In Artificial Intelligence*. Retrieved from: https://www.npr.org/sections/health-shots/2018/05/30/615466696/for-some-hard-to-find-tumors-doctors-see-promise-in-artificial-intelligence

Holstein, K., McLaren, B. M., & Aleven, V. (2018, June). Student learning benefits of a mixed-reality teacher awareness tool in AI-enhanced classrooms. In *International conference on artificial intelligence in education* (pp. 154-168). Springer, Cham.

Langley, P. (2019, July). An integrative framework for artificial intelligence education. In *Proceedings of the AAAI Conference on Artificial Intelligence* (Vol. 33, pp. 9670-9677).

Lee, K. F (Jun 24, 2017). *The Real Threat of Artificial Intelligence*. Retrieved from: https://www.nytimes.com/2017/06/24/opinion/sunday/artificial-intelligence-economic-inequality.html

Lynch, M. (August 27, 2017). *5 Examples of Artificial Intelligence in the Classroom*. Retrieved from: https://www.thetechedvocate.org/5-examples-artificial-intelligence-classroom/

Luckin, R. (2017). Towards artificial intelligence-based assessment systems. *Nature Human Behaviour, 1(3)*, 1-3.

Nasserghodsi, C. (Feb 17, 2017). *Artificial Intelligence in Schools is Closer than You Think*. Retrieved from: https://www.forbes.com/sites/forbestechcouncil/2017/02/17/artificial-intelligence-in-schools-is-closer-than-you-think/#798debd182f4

Zanetti, M., Iseppi, G., & Cassese, F. P. (2019). A "psychopathic" Artificial Intelligence: the possible risks of a deviating AI in Education. *Research on Education and Media, 11(1)*, 93-99.