Chapter 8
The Ethics of Machine–Based Learning:
Advancing without Losing Humanity

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ABSTRACT

Technological advances in the previous two decades have created an environment of innovation; however, there seems to be sometimes conflicting, emerging educational practices within communities of learners and educators. The central role of the instructor is being redefined by technology due to quickly-changing educational delivery modalities. By employing utilitarianism, relativism, and care ethics, the centrality of human agency in educational interaction is argued to be indispensable. Teaching and learning in massive open online courses, automated instruction, and learning analytics is altering the role of human instructors. This rapid modification of instructors' roles suggests that the ethical discourse of new educational technologies can be a frontier of critical thinking, especially as rubric-driven, automatic graders are refined and scaled.

INTRODUCTION

The vast expansion of computer-based learning technologies, encompassing processes of student records and learning artifacts, automated feedback systems, and surveillance of students, broadly shapes today's machine learning (Alpaydin, 2014). These advances also impact how teaching and learning can alter a student's path to academic success. As digital learning and teaching tools expand, one question emerges as the most critical: Is there an intrinsic, verifiable role in human teaching? This becomes an ethical question when technology is able to replace the human instructor; it is ethical because it not only reshapes how education is carried out, but also because the interaction of the agent changes, too. There is a real

value in human teaching, while not jeopardizing or hindering the speed of invention. Further, the scale by which teaching occurs is already enormous, as evidenced by the rapid expansion of massive, open, online courses (MOOCs); this is augmented by automatic grading technology, automated and digitalized teachers, and various other technologies re-making educational delivery.

Special attention must be paid to the ethical development of the technologies that are at the forefront of teaching and learning. Three elements in machine-based learning, the scale and scope of MOOCs, machine-based instruction, and learning analytics, ought to be subjected to rigorous ethical review due to their ability to shape the future of society.

ARTIFICIAL INTELLIGENCE, OPEN STANDARDS, AND EMERGING EDUCATION

Machine learning includes increasingly-complex systems of artificial intelligence, intelligent machines, and information aggregation driven, in part, by educational opportunity and potential for profit because schools are increasingly able to enroll students regardless of physical location. The rapidity of such innovation is underpinned with open standards, open source software, and systems designed for linking data (like JSON-LD) from searches to outcomes. What this means to classrooms, both virtual and brick and mortar, to students, and to instructors is an open question. Certain specific projects that link individual data, educational opportunities, and transparent assessment, like open digital badges, bridge together the current capabilities with a promise to the immediate future (Willis, Flintoff, & McGraw, in press). Similarly, new technologies can cull Internet sites like Wikipedia to assemble student textbooks in a matter of minutes; though these technologies are currently overseen by humans for verification, it might be worth asking if, at some point, for knowledge to be remixed and repackaged in a way in which micro-errors can lead to major gaps in verified and accurate content (Snyder, 2015).

Applied to higher education, artificial intelligence currently embodies modes of data aggregation, modeling, and forecasting (Cope & Kalantzis, 2015). The uses of technology to mediate emerging models of educational delivery like competency-based education capture political and financial attention. Some schools apply competency-based models of education to fields demanding proficiency in skills; learners may complete degree programs rapidly, and in the process, produce immense amounts of educational data that may be mined for expanding further competency platforms. Additionally, as an emerging educational mode, competency-based education poses a credible challenge to traditional regulations (Lacey & Murray, 2015). With tools like automated rubrics, competency-based education also challenges notions of how machine learning can be adapted to assess proficiency.

The value of education is brought into sharper focus with the increased focus on retention, student success initiatives, and educational assessment as evidenced by the rapid development of individualized learning data used in learning analytics and automated feedback (Rangel, Bell, Monroy, & Whitaker, 2015). These digital tools pivot on the same algorithmic and statistical advancements as business analytics: treating the student as customer, with educational success built by variables like demography and predicted grade outcomes. The agency of students' autonomy and individuality stunningly becomes that of an objectified, quantified, and wholly measurable retention-based science. Thus, despite the innovative practices underway in machine-based learning, the demonstrable changes to education warrant ethical reflection.

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