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Could Artificial Intelligence Replace Our Teachers?

Artificial Intelligence has been in the news a lot lately, from ominous warnings of its future implications from academic leaders like [Stephen Hawking](#) and Elon Musk, to panic around [Facebook AI developing its own language](#). And according to a recent report from the McKinsey Global Institute, roughly half of today's work activities could be automated by 2055. Could "teaching" be on that list? Today, Education World examines the current nature of AI's role in academia, including a prediction of where we're likely headed. It's not as scary as you think!

The Digitization of the Classroom

By now, the classroom is no stranger to online teaching and adaptive software. [Khan Academy's](#) AI identifies student strengths and learning gaps, and adjusts content accordingly. Adaptive assessment programs like [MAP](#) and [SBAC](#) are being used more and more often to help tailor school- and district-wide curricula. Software like [McGraw-Hill Connect](#) and [Aplia](#) allow teachers to manage coursework for massive amounts of students at the same time. Various other online learning programs tout their ability to reach students in ways they cannot quite access in the traditional classroom.

Despite these claims, however, [some studies are showing](#) that AI online courses and assessment programs are not getting the results that their real-world counterparts are in the classroom. But why? You'd think the tools students use on a daily basis, for everything from social media to entertainment, would be an "easy win" for engagement. You'd assume that the stress on computer literacy skills as an essential part of the 21st century workforce would make interacting with AI all the more necessary. You might also assume that the endless bounty of knowledge computers can store would render the limited ability of the human mind somewhat obsolete. And yet, for some reason, students generally are not responding to AI teaching resources in quite the same way.

What AI Can't Do

Before you go searching for a new career, consider the role of mirror neurons in human learning. [Mirror neurons](#) are "a type of brain cell that respond equally when we perform an action and when we witness someone else perform the same action." In short, an important

aspect of learning in primates is observing and imitating. Human beings learn best from emulating and practicing with other human beings. The teacher in the classroom is a human model of mastery for a particular content area, with skills and values that are uniquely human—and a student is simply not going to relate to AI with the same capacity. Knowing their teacher is not human puts great strain on a student's ability to empathize and imagine themselves as mastering the content and skills at hand. A computer is a computer. Computers are capable of levels of calculations we could only dream of achieving with our minds alone. But when a human teacher is able to show the benefits to learning content—and indirectly proving not only that it can be done, but that it is something to aspire to—learners are more likely to be inspired to work harder and make progress.

In fact, some argue that due to this lacking connection, robots simply can't inspire us. Coursera president and co-founder Daphne Koller notes, "Instructors are valuable, first of all, in creating the content. That's really important. But I also think it's important to have someone there to answer the really challenging questions if you really get stuck. And also, people will tell you that one of the most inspirational experiences they've had, that have often shaped their life, is someone who's been a really inspirational teacher." Inspiration is a product of empathy. When a teacher can connect to a student by having "been there," through heartfelt listening, or even through nonverbal classroom demeanor, they can inspire their students to learn, create, and excel. Even AI with state-of-the-art face rendering technology can't accurately put to practice all of these variables.

And sometimes we underestimate the importance of empathy in the learning process. Don't. Because despite incredible advances in the field, this is the heart of the limitation to AI as it stands today. The central challenge faced by developers tackling the role of AI as it applies to the real world continues to be: how do you teach a computer context and intuition? As an example, let's imagine a full humanoid robotic AI educator at the front of the room. Surely, this AI is less likely to make content-area errors. It will be able to access absurd amounts of information in the blink of an eye. It would be able to listen to answer questions. It might soon even have the ability to read the faces of students and respond accordingly. We have this technology, and it is expanding every day.

What it won't be able to do is combine these elements along with a thousand other human variables to create meaning. When a student shuts down in your classroom, the human educator is able to do just that. We can read a student's face, body language, appearance, and any number of other pieces of data to infer an emotional state. However, we are also able to cross-reference that inference with context: how does the student usually respond to lessons, what is going on at home, what are you noticing in the general social dynamics of the classroom, did they get in an argument with their best friend this morning, did they eat breakfast, did they sleep well, was a new video game released yesterday, is it particularly humid in the building today, what's going on in the general school culture right now, has this student been taking tests all day, are elements like depression or anxiety potentially relevant, or is it just an "off day" for a great student? We can then use our intuition to create a solution for that student. Even the most impressive AI would still struggle with appropriately analyzing the complex needs and immediate cues communicated by a classroom full of students. The context of knowing each individual student holistically, combined with the intuition of assessing the richness and complexity of a "classroom moment" is simply out of reach for AI. And despite progress, developers can't imagine you holding your breath any time soon.

AI TA: The Classroom of the Future

So, chances are good your job is safe for the near future. But it is going to change, and AI is going to be a part of that ignition. For what AI lacks in its empathic abilities, it certainly makes up for in its pure computing power, simplicity of interface, and information storage capabilities. And although robots will not be ushering us from our desks, they will be joining us quite soon ... as teaching assistants.

It's already happening in the fields of law, medicine, and banking. [IBM Watson](#) has been helping doctors diagnose medical conditions and analyze MRIs. Platforms like [Symantec's eDiscovery](#) and Kroll Ontrack help attorneys to sort through thousands of documents in the blink of an eye. [FutureAdvisor](#) or [Wealthfront](#) help investors to make smarter decisions. In these specific cases, the fields have played to the strengths of AI in order to make more tedious tasks manageable within a smaller window of time. And if you ask any teacher what they'd love more of in order to be more effective in their field: it's time.

But how might this technology be adapted to our daily work? Recently, a Georgia Tech professor [built an AI teaching assistant](#) for his classroom, which allowed him the capacity to more effectively manage over 400 students all over the world. His AI tends to answer more routine inquiries, freeing him to tackle some of the more complex student conundrums. A variety of humanoid robots are also being used in [South Korea and Japan](#) as a resource to supplement language learning. Students can go through any variety of conversational practices, and the AI can monitor mistakes in usage and pronunciation. In fact, research shows that these programs can help resolve issues like shyness, confidence, and frustration that can arise when practicing repetitively with a teacher: a robot will not get tired, no matter how many errors a child makes.

This will be the future of AI in the classroom. Imagine robot TAs (either stationary or actively floating about the room) answering some of the important, yet more rote content questions that come with a particular assignment. Listening AI like Echo and Alexa could quickly access vast databases mid-lesson to share information at conversational speed. Robots could be programmed to monitor clerical work like collecting assignments, immediately alerting parents and guardians of missing work, facilitating bathroom passes, and quickly supplying testing data in easy-to-read formats. Robot TAs could work separately with struggling students to drill content and easy-to-monitor skills. All of these elements free the educator—the empathizer, the creator, the innovator, the adaptor—to do more and be more in the classroom.

Surprisingly, the West is [much more hesitant](#) about embracing the integration of robots and AI in the our classrooms, but the tides are quickly turning. Should you start packing up your desk? Absolutely not. The bottom line is that these technologies work best when paired with an active human facilitator. But it certainly could make your job easier and more efficient. Best practices for the classroom do not go long unheeded. And AI might soon be a teacher's new best friend.

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