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HOW TO TEACH KIDS ABOUT AI

A researcher at MIT Media Lab has designed a middle-school curriculum to help demystify algorithms and their effects

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Today's middle schoolers may be the first "artificial intelligence natives," a generation that's grown up interacting with YouTube's algorithm or Amazon's Alexa smart speaker. Educators are grappling with how to teach children to be responsible consumers of the technology.

Blakeley H. Payne has one idea. A graduate research assistant at MIT Media Lab who studies the ethics of AI, Ms. Payne designed a curriculum to teach children about concepts like algorithmic bias and deep learning. She tested the week-and-a-half-long program in October with about 225 fifth- through eighth-grade students at David E. Williams Middle School in Coraopolis, Pa., outside Pittsburgh.

Ms. Payne, who does not have a background in education, developed the course of study with input from computer science teachers and researchers at the Harvard Graduate School of Education. Her "unplugged" curriculum mainly uses pen, paper and craft supplies so that teachers can adapt it for their classrooms, regardless of budget or technological know-how. Each 45-minute lesson typically includes a short lecture and demonstration, followed by a group activity and open-ended discussion. In one exercise, for example, students wrote an algorithm to build a better peanut butter and jelly sandwich. Ms. Payne plans to do a second run at several summer workshops in the Boston area, where children will get about four hours of AI

education daily. She also intends to open-source her curriculum online by the end of the summer.

She spoke with The Future of Everything from Boston. Here are edited excerpts from the conversation.

How do you teach AI concepts—which even adults have trouble understanding—to children?

The first thing that I found really important in my research was the question, "What do students already know about artificial intelligence at this age?" Ask kids, "How do you think artificial intelligence works? Open up your phone. Which apps use AI, and how?" The first step is getting them to recognize artificial intelligence in the world around them. If they can't identify it or relate to why it's important, there's no motivation for them to continue learning about it.

The next step is building common vocabulary: to ask "what is AI" and demystify it, because artificial intelligence is anthropomorphized more and more by media and tech companies. Think Alexa or Siri. I think kids struggle to recognize that it's not something like a pet. You have to integrate the ethics piece at every point, because you never want to fall into the trap of presenting an AI system as like a mathematical equation, with the authority of a mathematical equation.

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How did you structure your curriculum for middle schoolers?

These kids are growing up with AI since birth. There's some debate over using the term "AI natives," but that's what they are, at least by societal definitions. We've been teaching them about how AI can be helpful or harmful from the womb. The literature suggests that around middle school is a time when they're having these higher, more complex moral-reasoning thoughts. The idea is to target them as soon as possible when we think that they're capable of doing this. I want to caveat this with saying this is still an open research question. We might find that kids younger can do it, or kids older. The other thing that is important about middle schoolers is this is generally the age range

when they have their first cell phone or their first social media account. Having this intervention right when they're getting all of this independence is important.

In one exercise, children drew their visions of an updated YouTube recommendation algorithm. PHOTO: M. SCOTT BRAUER FOR THE WALL STREET JOURNAL

How did the students respond?

I think they were expecting a few more robots. They were able to have really adult conversations. I asked them at one point, "What is the goal of YouTube's recommendation algorithm?" One student said, "They want to sell us ads," and talked about AdSense and monetization. I thought I was going to have to put up all of this scaffolding for them to get to that point. I should have given them more credit from the start.

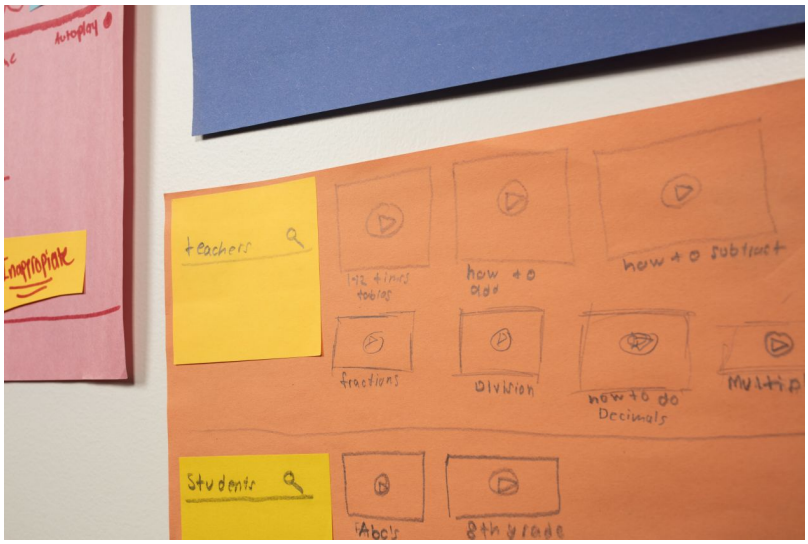
What do you recommend for educators who want to incorporate AI education into their own lesson plans?

The first step, honestly, is doing a little bit of self-education. Try not to be intimidated by the subject. There's this big image around artificial intelligence that it's a bunch of Albert Einsteins in a room, and that's just not true. Lastly, have honest conversations with your students about what technologies they're using. I find there's a lot of conversations around ethics and Cambridge Analytica. Twelve-year-olds don't use Facebook . If you say Facebook, they will laugh at you. So be thoughtful about how to make it relatable to them, and have the questions center around their real-world experience.

How does this generation of kids—who've never lived without smartphones and social media—think differently than previous generations?

It's too early to tell. Older generations were trained to see that these systems are neutral, objective, godlike and powerful. I hope this next generation will see them as possible tools,

possible weapons, but something to be critiqued in good faith: things that are changeable and manipulatable.



The goal of the program is to show children that 'artificial intelligence is everywhere,' Ms. Payne says. 'And they interact with it all the time.' PHOTO: M. SCOTT BRAUER FOR THE WALL STREET JOURNAL

What's your greatest anxiety about the future?

It can be really disheartening to see women and people of color, especially in the tech industry, being undervalued, underappreciated or just all-out excluded. That makes the work just so much harder to do.

Your greatest hope?

I'm inspired by my students. They engage with the material with so much more enthusiasm and nuance than I could have ever expected. One of my supervisors, Ethan Zuckerman, talks a lot about how it's easy to walk into a valley of depression around technology, but then find ways to walk out of that valley. I think that these students, based on what I've seen in the pilot, are still being very mindful of that valley and are capable of walking us out. They can talk about the fact that algorithmic systems can be racist, or that their Google search results aren't necessarily the most true information, but can be an advertisement. Those are conversations that I don't often see adults having, and that gives me hope.

Blakeley H. Payne will appear at The Future of Everything Festival in New York, May 20-23. Appeared in the May 17, 2019, print edition as 'What kids Know about Artificial Intelligence.'