

“Hey Alexa, Can You Help Kids Learn More?”

The next technology that could disrupt the classroom

by MICHAEL B. HORN

KENNETH EASTWOOD IS THINKING about the future. That’s how he frames his role as superintendent of the Enlarged City School District of Middletown, New York, delegating much of the day-to-day work of running a high-poverty turnaround district of 6,800 students to look ahead and concentrate on the big picture.

“My office is always planning for 5 to 10 years down the road,” he said. “We identify ideas, figure out their legitimacy by testing them, and if they work, then we find the money to implement them. It’s different from being buried in the today.”

On his mind a lot these days is the new technological habitat of children younger than five, who are surrounded by digital devices that can adapt to their specific needs and strengths. This next generation of students is growing up in a world not only where learning is ubiquitous, but also where talking to devices—asking them questions and giving them instructions—is commonplace.

That observation has generated a series of questions in Eastwood’s mind: What should a “voice-activated classroom” look like? How do we design it?

“We need to have the appropriate learning environments” for these students, Eastwood said. “I’m extremely concerned that this new flock will come in and will be used to voice-activated environments and technology-based learning programs that know them well enough to move with them at appropriate paces.” For these kids, chalk-and-talk isn’t going to cut it.

From Living Rooms to Classrooms

The potential of voice-activation technology to disrupt incoming students’ abilities and expectations is no hypothetical. In 2015, the market for smart speakers such as the Amazon Echo and Google Home was roughly \$360 million (a corresponding Apple device, the HomePod, is expected in early 2018). Estimates suggest that the market could reach \$2 billion—and about 75 percent of U.S. homes—by 2020.

As a result, students will be expecting “individualized



resources,” Eastwood said. “And when they don’t get that, more kids will be classified as ADHD, special education, and so forth, because they are not used to a passive environment and will be frustrated.”

So for forward-looking educators, the question is how best to put these new devices to work. Eastwood is an obvious person to ask.

Since 2013, Middletown has transformed instruction in all of its schools through incorporating technology and blended learning. Tour one of its elementary schools now, for example, and you see students actively using computers in one station while others work in small groups with their teacher or peers. The culture is crisp, and students know why

they are working on any given task and what they are trying to achieve. The district also has embarked on an ambitious project to build a robust open educational resources (OER) curriculum with learning pathways that meet the needs of different students.

Middletown has achieved some notable results, too. It has entirely closed the graduation-rate gap between white and minority students, even as the percentage of nonwhite students in the district has doubled to 84 percent and the percentage of students who receive free and reduced-price school meals has climbed over 30 percentage points to 74 percent. The district's schools have also narrowed the achievement gap in test scores, which NWEA MAP measures show are trending upward.

So how would Eastwood design a voice-activated classroom? He shared a few ideas.

In one design, each classroom would contain a few microphones around the room, which would recognize individual students' voices and distinguish between different students' questions and commands. In turn, a connected-learning application could provide verbal responses to an individual student's device. Students could work wearing headphones to create an intimate, quiet experience in a shared classroom environment. In another potential classroom design, instead of allowing all students to ask a question in an impromptu fashion, they might visit a question station instead.

These devices could also send teachers real-time data to help them know where and how they should intervene with individual students. Eastwood imagines that over time these technologies would also know the different students based on their reading levels, numeracy, background knowledge, and other areas, such that it could provide access to the appropriate OER content to support that specific child in continuing her learning. For example, in Middletown the district saw that their special education population responded better to learning through three-dimensional education resources in biology and experienced a big increase in proficiency attainment, whereas the rest of their student body did not experience those same results.

Importantly, he doesn't see these devices as replacements for teachers but as amplifiers for their work. Voice-activated devices can allow students to avoid getting stuck because they can't ask a question to unlock their growth in real time, and the technology has the potential to provide far more data to teachers about where their students need supports.

Time for Testing

No matter where voice-activated devices are physically placed in a classroom, Eastman thinks schools should start testing out different designs to understand everything from the quantity and timing of questions to what instructional changes teachers might have to make to leverage these technologies.

In addition to experimentation and tests of efficacy, there are other questions. Who will underwrite the development of a classroom that is not only voice-activated but also can learn to understand unique student needs? When is the best time to jump in with a costly reconfiguration of the classroom powered by "smart" devices? Perhaps personal devices—mobile phones, tablets, and laptops—will ultimately embed these voice-activated assistants in a more appropriate way for an educational environment—and spare schools the costs of purchasing standalone devices. After all, iPhones and iPads have Siri and Android devices have Google Assistant already.

What is the best use of big data and artificial intelligence in education? Can they help solve the most intractable—and costly—problems, or would they be put to better use supporting more routine challenges or, as Michael Petrilli recently argued in this column, helping advance basic education research ("Big Data Transforms Education Research," *what next*, Winter 2018)?

Still another question is whether voice-activated devices are an advancement over what we have today—Google searches,

texting, and online chatting. Eastwood believes they will be, because the modality of verbally asking a question, as opposed to typing something on a device, is more natural and will cause fewer interruptions in a student's train of thought.

And there are bound to be privacy concerns. Devices that can recognize individual students' voices and "understand" their specific learning needs are certain to raise questions with the Children's Online Privacy Protection Act (COPPA) and the Family Educational Rights and Privacy Act (FERPA).

But Eastwood is unfazed. These are real issues, but ones that should be tested and learned from because that's the goal for everyone in an educational environment. The rapid emergence of voice-activated tools in all other parts of society is too profound to leave outside the classroom door.

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Are voice-activated devices an advancement over technologies already available? One forward-looking district superintendent believes they will be, because the modality of verbally asking a question, as opposed to typing something on a device, is more natural and will cause fewer interruptions in a student's train of thought.