Special Education: Practice & Pitfalls

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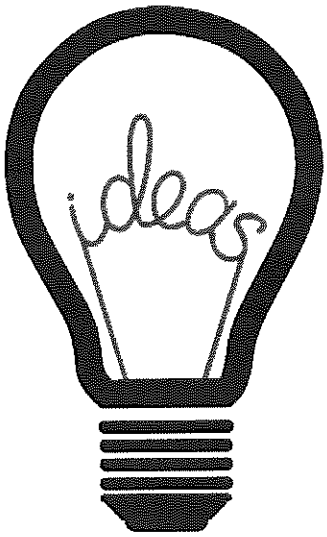
Five Top Technology Trends in Special Education



By Benjamin Herold

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Fueled by technological advances, changing state policies, and a continued push from advocates, ed-tech companies and researchers are crafting new tools and strategies to better serve students with disabilities.

Underlying a range of new trends, experts say, is a growing recognition that designing learning resources from the beginning with students with disabilities in mind can benefit all students.

"Developers and [K-12] consumers are now very tuned in," said Cynthia Curry, the director of the National Center on Accessible Educational Materials for Learning, more commonly known as the AEM Center. "They're not only aware of the legal requirements but the societal shift around ensuring that all learners have the opportunities for advancement."

Against that backdrop, *Education Week* canvassed the field for insights on new developments in the use of technology to support special education.

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Editor's Note: Special Education From the View of Students, Teachers, and Parents

Some promising technologies, such as virtual reality, are still very much in the experimental stage.

Some segments of the K-12 sector, such as the burgeoning "Computer Science for All" movement, are hustling to make up for past oversights.

And some experts are sounding cautionary notes.

"Technology is great, but it can also diminish opportunities for slower mental processing that creates a foundation kids can build on over time," said Sheldon Horowitz, a senior adviser at the National Center for Learning Disabilities. "For kids who struggle by virtue of a learning disability or attentional disorder or some other challenge, that can present a double scoop of risk."

Still, there's plenty to be hopeful about. Here are five trends in the use of educational technology for special education that K-12 educators and policymakers should keep an eye on.

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1. Greater Personalization

As a technology lover who is blind, Luis F. Pérez has long made use of assistive technologies and features such as screen readers (which "speak" the content that appears on a device) and high-contrast screen settings. But it's frustrating and time-consuming to have to reset his preferences every time he starts fresh on a new computer or application.

Now, though, that's changing.

"Profiles can now follow you as you log into different devices," said Pérez, a technical-assistance specialist at the AEM Center. "It's there for you when you need it."

Leading the shift is Google, which has made huge inroads into K-12 with its web-based Chromebook devices and popular G Suite productivity tools.

Among the elements that Google touts in those products are a "select-to-speak" feature that allows users to highlight text and have it read back to them; Braille displays to read and edit documents, spreadsheets, and slides; and artificially intelligent tools for word prediction and translation that users can adopt via extensions to Google's Chrome web browser.

All can be tied permanently to an individual user's account.

This all means students using Chromebook can "log into any device running Chrome and enjoy the same accessibility settings and experience without having to go through another onerous set-up process," said Naveen Viswanatha, the lead product manager for Chromebooks for Education.

2. Early Screening

Over the past 17 years, millions of schoolchildren have had their foundational reading skills assessed using a digital tool called mCLASS, developed by ed-tech company Amplify.

Recently, though, Amplify tweaked its software. In response to new legislation in more than a dozen states, the company added new measures into mCLASS that also screen for dyslexia.

"Early identification is key," said Krista Curran, the general manager for assessment and intervention at the company. "Schools and districts across the country are now [required to] use observational assessments to aid in that. We help them do it more efficiently."

It's not just Amplify, and it isn't just about dyslexia or just for schools.

Researchers such as Fumiko Hoeft of the University of California, San Francisco, and Nadine Gaab of Boston Children's Hospital are leading efforts to develop new mobile early-screening apps that can be used at home and in health-care settings.

And a startup called Babynoggin is taking a similar tack, targeting pediatricians with a suite of mobile apps that can be used to screen children for delays in the development of motor skills, language, social-emotional abilities, and cognitive processing.

Such tools can be used to screen for risk factors but not to formally identify learning disabilities, which requires direct interaction with a trained professional.

And Babynoggin founder Jin Lee stressed that her company isn't trying to reinvent existing, validated screening tools. Instead, Lee said, it's about making the screening process more efficient and affordable for parents, doctors, and schools alike.

"A million kids are entering schools every year with undiagnosed developmental disabilities," Lee said. "This is about making sure they don't fall through the cracks."

3. Virtual Reality

For students with autism, navigating a crowded school hallway or lining up in the cafeteria can be highly fraught.

Sean J. Smith believes that practice in a virtual-reality environment can help.

"We've taken the literature on effective ways to develop social competencies and skills in students with autism and learning disabilities, and we've created scenarios that can help children learn how to interact with these challenges in their environment," said Smith, a professor of special education at the University of Kansas.

So far, Smith said, his team has developed more than 30 scenarios, spanning 10 virtual environments. When a student uses the tool, he or she interacts with avatars and is given choices about how to respond—then gets real-time reinforcement for appropriate behaviors and instruction on what he or she might do better.

Other examples of VR for students with disabilities include environments that promote mindfulness and allow users with motor disabilities to manipulate objects in ways they can't in the physical world.

Most such work is still in the testing phase, experts caution. Some observers also have raised concerns that VR may trigger emotional and psychological distress and could have as-yet-unknown effects on brain development, especially in young children.

But the hope, said Smith, is that VR can bridge a new gap emerging in schools that increasingly expect students to demonstrate an aptitude for teamwork and collaboration.

"We don't outright teach those skills, and so a lot of learners struggle," he said. "VR offers a way of introducing that in an environment that feels realistic."

4. Making Computer Science Accessible for All

More than 100 companies, universities, and nonprofit and advocacy organizations have signed a new "accessibility pledge" intended to make K-12 computer science education more inclusive.

Among the groups taking the most significant steps: Bootstrap, a research project based out of Brown University that develops computer science curricular modules to be used within schools' existing math and physics classes.

One of Bootstrap's goals is to make its user interfaces friendlier, including for students who are unable to use a computer mouse. Another is to incorporate a screen reader capable of reading the output of a program a user creates. The most ambitious is to create a "toolkit" that can be integrated with multiple programming languages, read code aloud, and also verbally describe the code's structure and purpose—in multiple languages, at age-appropriate reading levels.

"The users we've worked with on this, some of whom are professional programmers, have said, 'God, I wish I had this growing up. I wish I had this now,'" said Emmanuel Schanzer, Bootstrap's founder and co-director.

For many of the pledge's other signatories, embracing accessibility will mean more basic steps, such as putting captions on videos.

Pressure to take such steps is necessary, said Ruthe Farmer, whose title is chief evangelist at the nonprofit group CSforALL, which is behind the accessibility pledge. She said the K-12 computer science materials market developed so quickly that those disabilities were often an afterthought.

"It's early enough that if we address this now, we can build a fully inclusive" movement, Farmer said.

5. Making 'Open' More Open

Schools' embrace of free open educational resources, or OER, (which educators may use, adapt, and share as they see fit) has many potential benefits.

But Jose Blackorby, the senior director of research and development at CAST, a nonprofit that promotes the principles known as universal design for learning, says the OER movement also has an often-overlooked problem: The pdf is not our friend.

The commonly used electronic-file format for documents with text and graphics often doesn't work well with screen readers. It generally doesn't allow supportive and assistive features to be embedded. And pdfs are difficult to make searchable.

"If you're presenting content using digital formats, you should have a lot more options on how to customize them for students with visual impairments, autism, and dyslexia," Blackorby said. "But none of that works terribly well on pdfs."

Now, though, CAST, through its Center on Inclusive Software for Learning, has a five-year grant from the U.S. Department of Education's office of special education programs to tackle those problems. Blackorby described three main goals: Develop new authoring tools that would make it easy for OER creators to output their content in more adaptable formats, such as EPUB. Create a "preference discovery tool," that enables students to learn what kind of customized, built-in digital learning supports work best for them. And build a new "OER player" that would make it easy for users to activate assistive supports such as text-to-speech when they open the files up on any device.

There will no doubt be obstacles, Blackorby said, including the "Wild West quality" of the current OER landscape.

But there's reason to be excited.

"The marketplace is changing very fast," he said. "But where it's going to end up is anyone's guess."

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