HOW EDUCATORS ARE USING BIG DATA TO HELP STUDENTS NAVIGATE THE KNOWLEDGE ECONOMY

Today's technology is helping schools create a blueprint for long-term success

Digital tools are turning the sorcery of marketing into a scientific enterprise. Using big-data analytics to not only identify but also predict consumer preferences, behaviours and cravings, marketers are reaching customers when they are in the mood to buy. Ads for allergy relief hit Facebook feeds when pollen counts swell; recommendations for a helmet appear after you purchase a mountain bike. Messages are relevant and therefore more effective. This same technology is now elevating modern education and equipping students with the tools they will need to succeed in a new digital world. Armed with detailed, real-time information about students' behaviour and academic progress, teachers and school administrators can personalise learning, improve engagement, and curb concerning behaviour. And, teachers can adjust instruction.

Using big-data analytics

At Loring Community School, in Minneapolis, school officials put big data to work when suspension rates shot up for fourth and fifth graders, says Eric Moore, director of research, evaluation and assessment for Minneapolis Public Schools. Using a dashboard that merges information from a variety of databases—such as grades, test scores, attendance and disciplinary actions—officials spotted that the suspensions were occurring after students had a large block of loosely structured time. Instead of scheduling recess, followed by lunch, followed by a study lab, students were sent to their main classroom after lunch—and suspension rates dropped.

Using big-data analytics, educators are able to fine-tune everything from class schedules to lesson plans to better suit each student. "We are able to see patterns," says Moore. "So it isn't simply that we have the numbers; we are also able to put that information in context."

"We have the capacity to display data in an actionable fashion," says Dr. Eileen Lento, Director of Global Education Marketing and Advocacy at Intel. "It can be used at the individual level, and we can aggregate it at the classroom, the school, the district and the population level."

Empowering educators

Empowering educators to make better-informed decisions about everything from district policy to individual student interventions is critical, says Dr Lento. "The world our children are entering is not the world we entered," she says. "The skill sets you need to be successful have changed dramatically. Even trades like construction require the use of technology. We also know these children are going to have many jobs within their lifetime, so being adaptive and being a lifelong learner is now a requirement to be successful in life."

Digital tools

In the Minneapolis public school system, having access to the digital dashboards enables educators to view many different data sets that span a child's entire school career. This not only enables educators to monitor students' growth over time, it also makes use of non-cognitive data, such as student attendance, to help educators predict whether a child is at risk of dropping out of high school. When you consider that each day 7,000 students in the US drop out of high school, tools that can fix this become all the more important. "With predictive modeling, we want to take a look at a variety of student characteristics, and really identify students who are at risk as early as sixth grade and provide intervention and support so that we aren't waiting years down the line," says Moore.

Building sucessful data-driven classrooms

Personalised, adaptive learning may hold the key to true education transformation, but to bolster the success of data-driven classrooms, school district chief information officers must ensure that a solid infrastructure is in place, says Greg DeYoung, CIO and executive director for information technology services at the Blue Valley School District, in Johnson County, Kansas. For instance, platforms and applications have to be compatible with the existing student information system.

But even the most sophisticated platform won't work if the school system doesn't have the right culture. "The bigger question is, Is the culture of your organisation ready?" says DeYoung.

To bring educators on board, DeYoung says it's important to address the areas that are already of high concern—for example, high-stakes testing. "Typically, you want to roll out these systems where there are already pain points, and enhance their ability to do what they are already trying to do instead of introducing a new workload," he says.

For instance, some K-12 schools are experimenting with systems that focus on a particular arena. Companies such as Knewton facilitate personalised learning by determining what a student is grasping and which lesson plans are best suited for that child; BubbleScore is an application that assists with grading and reporting under Common Core state standards; and iParadigms helps teachers spot plagiarism and other problems.

Creating flexible dashboards

Including educators in the development process is also critical. Mr Moore notes that his team regularly meets with teachers and principals and modifies dashboards based on their suggestions.

"You don't want to overwhelm people with the data," he says. "We are very cognisant of how the dashboard is organised and will actually remove items based on feedback. So if there is a graphic that isn't particularly useful, we'll remove that."

Creating a dashboard that is flexible enough to adapt to such input enables Mr Moore's team to focus on the user's experience. "School districts are very complex environments, and they change on a regular basis, so we wanted to have a system that could be easily customised," he says.

Parent and community inclusion

Parents and community members should also be included in the process. "You need to have an ongoing communication with the parents so they understand why these systems will benefit their children," says Ms Lento, who notes that oftentimes parents are intimidated by the technology, have concerns about privacy or just don't see a need for it. "When a parent walks into a school and it doesn't look anything like when they went to school, that's hard for them," she says. "Helping them understand why this is good for their child is really important."

Ms Lento notes that in some school districts, parents can actually access student information systems themselves to get a window into their child's progress. "A parent can look at the systems online and see, for example, if their child was late to class or failed to turn in homework. They don't have to be so dependent on waiting for the

Quick and easy data for action

Similarly, Mr Moore says he wants to empower educators to find answers themselves. So if a question arises during a meeting, they can access the dashboard and quickly see graphs that cut the data in many different ways, such as race, gender or eligibility for free or reduced lunch.

"We are trying to create an environment where our principals and teachers don't have to spend a lot of time searching for the data but instead have it in front of them and can quickly go to the analytics and the action," says Mr Moore. "Their time is very limited, and they have a very important and complex job. So if we can organise the data in a way that is easily understandable and meaningful, then we have done our job here."

To learn more about how Intel is contributing to innovative approaches to education, visit intel.com/forward.