TECH UNLOCKS TEACHERS' CAPACITY

SOFTWARE IS A TEACHING TOOL, NOT A TEACHER REPLACEMENT

With a boost from education technology, teachers can use their time, attention, and energy in new ways to make a bigger difference for their students.

BY THOMAS ARNETT

What is personalized learning? If nothing else, it's a term that's hard to pin down. Educators of various stripes use the word "personalized" to label a variety of approaches — ranging from student-designed projects and internships to software-based adaptive learning, to a whole host of activities and practices in between.

Yet most efforts to personalize learning have a common idea at their core: Students' learning needs differ, and therefore students deserve an education that is responsive to those needs. Whereas conventional education functions best when students conform to the system, personalized learning is about redesigning the system to meet individual students' needs.

Personalizing learning for students is by no means a new idea. Over a hundred years ago, John Lancaster developed a model of schooling that grouped students by mastery in different subjects, which would today be considered a form of competency-based education (Dockterman, 2018). In our modern era, mainstream schools have long encouraged differentiated instruction.

Furthermore, if you call up memories of your best teachers, you'll likely find that what made them great was how they personalized learning for their students: They cared about students as individuals, they believed in each student's potential, and they worked hard to give students the particular supports they needed to be successful.

Nonetheless, meeting students' individual learning needs has never been easy and seems to only become more challenging with the passage of time. Teachers today struggle to keep up with society's expectations. It isn't enough for them to just cover their curriculum. We expect them to differentiate their instruction, address students' social and emotional challenges, close achievement gaps, address bias and discrimination, and ensure all students are prepared for life in the 21st century.

It's hard to imagine teachers measuring up to these goals just by getting better and working harder. As one teacher shared recently in the *Los Angeles Times*, "I cannot help but ask myself, daily, how so many people do this job. If someone as committed as I am to children and education is drowning in expectations, crying at night, falling prey to monthly illness due to lack of sleep, who does survive this business?" (Babcock, 2018)

THE ROLE OF TECHNOLOGY

Fortunately, what makes personalized learning today different than efforts to personalize in the past is the role technology can play in making personalized learning possible at scale. A key way to unlock teachers' capacity comes from using technology to take lower-order work off teachers' plates.

When we consider the long march of progress across human history, our common story is interwoven with advances in technology. From the wheel, to the steam engine, to the supercomputer, technologies expand what people are capable of producing. Food, clothing, housing, energy, and entertainment are all far more affordable and accessible than they were just a few generations ago because technology has steadily pushed out the frontier of human productivity.

Technology can play a similar role in education. Teachers' time is scarce, and the demands on their plates often

go beyond their human capacity. But with a boost from education technology, teachers can use their time, attention, and energy in new ways to make a bigger difference for their students.

Technology helps address teachers' constrained capacity in two key ways. First, it can **enhance** teachers' effectiveness at the things they already do. For example, a chalkboard enhances how teachers convey information by allowing them to complement their verbal explanations with visual representations. Similarly, high-quality curriculum enhances teachers' lesson plans by directing them to effective teaching methods. As a more recent example, IBM Teacher Advisor is a web-based instructional planning tool that helps teachers find high-quality lesson materials tailored to their students' learning needs.

Second, technology can **expand** teachers' capacity for designing and leading learning activities that are otherwise impossible or impractical. For example, technologies like Lexia Core 5 personalized instruction model expand teachers' ability to take daily snapshots of students' learning and give students targeted instruction in ways that are almost unfeasible for a teacher to do manually.

Similarly, when technologies for writing instruction, such as Ecree or NoRedInk, provide automated feedback on the grammar and structure of students' essays, teachers can focus more of their feedback on other important elements of quality writing, such as reasoning, rhetoric, and style. Similarly, math instructional technologies like Khan Academy give teachers a manageable way to implement mastery-based instruction, a strategy that is hard to coordinate otherwise.

WHAT TECHNOLOGY CAN'T DO

As technologies become more common in classrooms, some worry that technology's ultimate end will be to push teachers out of their jobs. This could happen if we set a low bar for what we expect quality education to look like — drill-and-kill instruction measured solely through tests with narrowly defined "right" answers. Yet when we consider the high aims of personalized learning, we see that technology's limitations make teachers more valuable than ever.

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Consider, for example, essay grading. For years, word processors have been able to point out corrections for spelling and grammar errors. More recently, intelligent software now offers feedback on elements of structure and style, such as whether a student has a topic sentence at the beginning of each paragraph and whether each paragraph contains evidence related to the topic sentence and the essay's thesis.

But software cannot give feedback on many of the qualities that really define great writing, such as whether the student's rhetoric and logic will resonate with her intended audience. It takes a human to give feedback on the more nuanced aspects of human communication.

In contrast, learning becomes far more personal for students when teachers have the time to give regular, individualized feedback on higher-order skills. But in a conventional classroom, how often do English teachers have time to conference individually with students about the quality of their writing, especially when correcting grammar and structure already takes up so much of their time?

Unfortunately, most teachers' days quickly fill up with planning lessons, writing quizzes, running copies, covering content, participating in staff meetings, and grading lower-order assignments, with little time left for many of the high-value activities described here.

The same holds true in other academic domains. Software can't tell students if their research questions for a science project are worthwhile and reasonably scoped, nor can it tell them which engineering and design challenges they should tackle to improve a simple machine. Additionally, software can't coach soft skills, such as working effectively in teams, navigating interpersonal conflict, setting personal goals, and persevering through obstacles. The skills students will need to future-proof their careers against the rise of machines are also the skills they can't learn from machines.

Technology can't get to know a student.

Software today can access a lot of data about a student: home address, race and ethnicity, diagnosed learning disabilities, family income, attendance records, test scores, browser history, and even keystrokes and mouse clicks.

But with all that data, can software really know a student? Can a computer understand how his social status at school leads him to feel when he's assigned to work with a particular group of peers on a class project? Or can it predict that she'll enjoy reading a particular novel because it reminds her of her best friend from the town where she used to live?

Software can make a lot of useful inferences based on patterns it finds in the data it collects. But it can't collect data on all the important factors that shape a students' learning experiences, nor can it model all of the psychological complexity of childhood and adolescence. Real knowing and

understanding is a human-to-human experience.

Yet how many teachers have time to meet regularly with each of their students one-on-one just to ask about how they're doing, let alone attend students' extracurricular activities or visit students' homes to get to know their families? Caring about students isn't constrained by time, but showing that you care is.

Fortunately, the more software can keep track of the measurable aspects of students' learning, the more teachers can focus on knowing the immeasurable attributes of their individual students.

Technology can't care about a student.

Where do students get the motivation to learn? At times, motivation may come from pure intellectual curiosity. But more often than not, motivation comes from relationships. For example, a student stays after class for extra tutoring because he cares what his parents think of his grades and he believes his teacher's confidence that a little extra practice will help him get the grades he wants. Or a student becomes excited about science because a teacher she loves also loves science.

Students often work to learn and achieve for the praise and approbation of people who matter in their lives. Software, for all its wondrous abilities, can't offer that sense of genuine caring.

COMBINING TEACHERS AND TECHNOLOGY

Software and devices can't make learning holistically personal, but neither can teachers personalize learning on their own. In short, the classroom of the future — if made to be more personal — will inevitably involve a mix of both teacher and technology. Each will play a role that complements the other.

As you aim to make learning more personal in your school or district, there are questions to consider that will be specific to your context. Nonetheless,

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no matter how you define and design personalized learning, here are four essential considerations to keep in mind as you help teachers develop their capacity to use technology effectively to personalize learning.

Focus on the *why*. Personalized learning is about meeting students' individual needs. As you select, develop, and roll out tools and practices, you should continually ask, "How do all these things amplify an educator's capacity to better meet students' individual learning needs?"

Remembering this question will help you avoid adopting tech for tech's sake or using tech merely as a low-quality substitute for teacher-led instruction. Similarly, it will help you persevere with bold new personalized learning practices that stretch beyond the norm.

Give educators job-embedded support. Most schools recognize that teachers need up-front training on how to use new tools and practices. Yet many neglect the importance of ongoing support. As educators take new tools and practices to their classrooms, they wade into a messy world of creative problem-solving as they figure out how to adapt those tools and practices to their contexts and integrate them with existing routines and practices.

Inevitably, there will be bumps in the road. In those moments, teachers need coaches and colleagues who can help them get over bumps before they turn into roadblocks. Professional learning communities can offer a critical forum for sharing what works and troubleshooting what doesn't.

Use technology to personalize learning for teachers. Teachers come to personalized learning with different levels of readiness. Furthermore, different content areas and instructional strategies lend themselves to different approaches to personalization. Fortunately, many of the pioneers in technology-enabled personalized learning have shared their best practices online.

Keep an eye on actual progress. Any new practice, no matter how much it promises to amplify educator capacity in the long run, exacts a tax on capacity. Teachers have to spend time upfront learning how to implement new technologies and practices, and then spend time on an ongoing basis managing new technologies and maintaining new practices.

As you roll out personalized learning, continually monitor whether personalization strategies that make sense in theory are bearing fruit in practice. Verify that actual benefits outweigh potential drawbacks.

Although it's hard to define a set of practices that constitute personalized learning, it should be clear what personalized learning is not. Personalized learning is not a particular tool, strategy, technology, or instructional model. Rather, it is about using tools, strategies, technologies, and instructional models in ways that amplify educators' capacity to meet students' individual learning needs.

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Thomas Arnett (tarnett@christenseninstitute.org) is a senior research fellow at the Clayton Christensen Institute.