Individualizing learning through adaptive teaching

As schools and teachers are confronted with an increasingly diverse student population, there is widespread agreement among scholars, policymakers and practitioners that our public school systems need to do a better job of meeting the needs of each individual student. Many people argue that a more productive way of dealing with diversity is to capitalize on students’ differences by individualizing learning experiences instead of directing instruction towards the typical or average student in a classroom.

Such calls for individualized or personalized learning are well in line with findings from research on learning and instruction. In the past decades, this research has offered remarkable insights into how people learn, showing that learning is a highly individual process. For instance, students differ greatly in the knowledge and basic cognitive abilities they bring with them into the classroom, and these factors greatly influence how well and how quickly new content can be learned.

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Other characteristics of individual students affect the learning process as well. Research in the field of biology, and specifically genetics, also suggests that students learn most effectively when we take into account their individual differences.

How can our school systems organize learning for large numbers of students and simultaneously respond to all of their diverse needs?

Today, many people are putting their hope in technological solutions. In fact, numerous personalized learning systems and adaptive learning technologies are already in use in schools and school systems around the world. These technology-supported solutions use artificial intelligence algorithms to match tasks to an individual student’s skill level, drawing from a large pool of tasks with a variety of characteristics.

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While such adaptive learning technologies for individualizing learning experiences are indeed promising, there are several reasons why such an approach falls short and has certain drawbacks.

First, we humans are social beings, and learning is a process that takes place as individuals interact with their social environments. Research has shown that what matters most for learning is the quality of the interactions between teachers and students around meaningful content, as well as the quality of teachers’ explanations and their responses to students’ work and ideas.

Second, learning is shaped not only by students’ cognitive capabilities, but also by their motivational and emotional states as well as other personal characteristics. However, educational technologies focus mainly on adjusting a task’s level of difficulty.

Third, learning technologies often require a great deal of autonomy and self-discipline from learners. The problem is that students often have difficulty with self-regulated learning and need substantial guidance from their teachers; this is particularly true of low-achieving students. Thus teachers play an absolutely crucial role in effective learning.

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One approach that focuses particularly on teachers in an effort to individualize learning is adaptive teaching. Adaptive teaching acknowledges that students differ not only in their prior knowledge and cognitive abilities, but also in their interests, motivational and emotional states, personalities, and other characteristics. Consequently, adaptive teaching aspires to adapt instruction in a way that takes into account these individual characteristics and how each student is best able to learn.

Adaptive teachers vary the level of structure and support they provide, in response to students’ competencies and their learning needs at that moment. They provide high levels of support for less able students and less support when students are capable of working alone. The goal is for each learner, whether a beginner or a more advanced student, to be equally challenged and motivated. This means taking into account not only differences between students, but also the fact that students change and develop over time. Instruction must therefore be continually adapted as students become more competent learners.

The more capable and competent students become, the less guidance they need and the better able they are to regulate their learning process. The ultimate goal of adaptive teaching is to increase the number of self-regulated learners. Adaptive teaching and self-regulated learning are two sides of the same coin.
“The goal of adaptive teaching is for all students to be able to participate fully in classroom learning opportunities and reach their full potential. To that end, it is important to capitalize on the strengths of each student, take advantage of their capacity for self-regulated learning and encourage collaborative learning.”

Teachers can use a variety of techniques to adapt their instruction to meet the needs of individual students. For example, they can vary their instructional methods, the materials used, the level of difficulty, the time students are given to work on a task, and the content to be learned. This means that different instructional methods will be needed for different students at any given time. However, teachers must never lose sight of the group context of a classroom and the social nature of learning.

The goal of adaptive teaching is for all students to be able to participate fully in classroom learning opportunities and reach their full potential. To that end, it is important to capitalize on the strengths of each student, take advantage of their capacity for self-regulated learning and encourage collaborative learning, with students learning from one another.

Adaptive teaching is a promising approach for meeting the challenge of individualizing learning. Educational technologies may be helpful in individualizing students’ learning experiences, but they should always be embedded in meaningful teacher-student interactions.

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