



# **Increasing Student Achievement with Adaptive Learning Technology**

Tech & Learning  
Survey Results

# Increasing Student Achievement with Adaptive Learning Technology

Findings from the *Tech & Learning* survey show that most educators use adaptive learning systems for intervention, most usage is in grades 3 to 5, and that there is some confusion over what it means to be “adaptive.”

By Annie Galvin Teich

The concept of adaptive learning has been with us for a long time. The idea that interactive technology could function as an electronic tutor, helping students acquire knowledge and deepen understanding—at their own pace—has been the basis of a number of adaptive approaches to instruction.

In a typical classroom, teachers might use a diagnostic assessment to determine a course of instruction for the class. Students would be evaluated at regular intervals, and the teacher would provide any remediation or intervention as needed. Based on the results of subsequent assessments, the teacher would adapt and individualize instruction to achieve particular learning outcomes. Even though parts of this process could be automated, most often it is a manual process that relies on the teacher’s ability to meet the needs of all her students after separate efforts to assess, analyze, and instruct.

Now, emerging educational technology is proving that personalized student assessment and instruction can be successfully delivered on an ongoing basis, aligned with learning standards and desired outcomes. This is particularly important in K-12 education, where ensuring high achievement for all students requires that schools deliver more personalized and differentiated learning to each unique student. A byproduct of this process is that students assume responsibility for their own progress toward individualized learning goals. Interactive technology can support individualized progress while also increasing student engagement and motivating students to grow and persist. At the same time, adaptive learning algorithms can be churning student response data and automatically informing and adjusting a course of instruction to advance each student along an individualized learning pathway.

As *Tech & Learning* editors investigated this emerging technology, they felt it was an opportune moment to conduct the first K-12 survey on the use of adaptive learning technology. *Tech & Learning* subscribers were emailed an invitation to participate in the survey earlier this fall. More than 3,000 educators responded, providing a well-rounded sample of the *Tech & Learning* audience. This paper reports on the results of the survey, documenting what was revealed about how educators are using adaptive

## About the Author

Annie Galvin Teich has worked for more than 25 years in K-12 publishing with broad experience in audience development, sales, direct marketing, and customer communications. She now works with education companies to develop shareable content such as case studies, white papers, newsletters, eBooks, Web articles, social media, and webinars.

learning software and systems, the most important benefits, the challenges to implementation, and the future promise for student achievement.

The research in this white paper was underwritten by DreamBox Learning, Inc., an adaptive learning math software company based in Bellevue, Washington. However, decisions about the survey questionnaire and interpretation of the findings in this white paper were made solely by *Tech & Learning*.

### **Summary of Findings**

The goal of the survey was to determine how many educators are currently using programs they believe to be adaptive and how they are using them. To ensure that everyone was operating with the same understanding, the survey began with *Tech & Learning's* definition of adaptive learning. "Adaptive learning systems are software-based technologies that automatically customize curriculum to the knowledge level of the learner. The algorithms actively track and access student performance to provide feedback to the teacher and student about the student's progress on an ongoing basis."

The largest segment of respondents was composed of K-8 educators. A smaller group consisted of high school educators, with the remainder distributed across all grades. Two-thirds of the respondents work in public schools and "teacher" was the largest category of job title cited. Other respondents included administrators, district staff, and technology support staff.

More than 40% of the respondents affirmatively answered the question, "Are you currently using adaptive learning systems in your school or district?" As the intention of the survey was to learn more about those educators using adaptive learning technology, most of this paper will focus on these respondents' answers.

#### *Findings include:*

- 70% of users cited intervention as the number one reason to use adaptive learning software; 40% use it for enrichment.
- 49% use adaptive learning software as supplemental curriculum while 42% use it as core curriculum.
- The greatest number of student users are in grades 3-5, followed by middle school (grades 6-8) and then by K-2 students.
- 80% of users reported using adaptive math software while 78% reported using it for reading.
- The greatest objection or challenge to using adaptive learning technology was that students are spending too much time in front of a screen.
- Access at both school and home is an issue.

But the most important finding in the survey was that, even among educators who reported using adaptive learning technology, there is significant misunderstanding regarding which programs qualify as true adaptive learning software and which programs merely have certain elements that are adaptive.

### **Profile of Adaptive Learning Users**

More than 1,200 respondents identified themselves as users of adaptive

learning software. The majority of these users are K-8 public school teachers. Users were asked to rank the importance of different aspects of adaptive learning. The table below lists these from the highest to the lowest in importance.

Rank Average	Feature
9.25	Offers personalized or individualized learning
9.12	Provides intervention for struggling students
8.92	Improves overall student achievement
8.79	Unique pacing for every student
8.72	Offers enrichment for advanced students
6.45	Lowers cost of instruction

Respondents reported the purpose of their individual use of adaptive learning as follows:

Value	Count	Percentage
Intervention	727	69.77%
Enrichment	409	39.25%
Supplementary/ complementary	505	48.46%
Core curriculum	432	41.46%
Other	88	8.45%

As this was a benchmark survey, it was important to get a sense of the trend line of use for adaptive learning software. Adaptive learning users indicated that 44% of the students in their school or district used adaptive learning systems last year; this year that percentage has grown to just under 50%. Next year, respondents estimated that 56% of their students would be using adaptive learning programs. This positive trend indicates the growing availability of adaptive programs and greater awareness of their benefits to student achievement.

Users reported that they are using adaptive learning programs primarily for math and reading:

Value	Count	Percentage
Math	807	80.06%
Reading	781	77.48%
Other	169	16.77%

in the following grade levels:

Value	Count	Percentage
Grades K-2	485	53.65%
Grades 3-5	664	73.45%
Grades 6-8	551	60.95%

47% reported that their students do not have access to adaptive learning programs from home, and many reported that sufficient access at school can be problematic. Lack of access is often a result of inadequate technology infrastructure as well as lack of devices.

As every educator knows, there is rarely enough time in the school day to accomplish everything that is needed, so software must deliver results to justify the investment of time. When asked about the problems and challenges they experience in using adaptive learning programs in their school or district, survey respondents gave the following reasons:

Value	Count	Percentage
Too much screen time for students	219	26.32%
Doesn't engage students	210	25.24%
Teachers have too little control	202	24.28%
Not aligned with Common Core	132	15.87%
Not rigorous enough	102	12.26%
Other	287	34.50%

## Intelligent Adaptive Learning™

DreamBox Learning's pioneering Intelligent Adaptive Learning™ platform adapts in real time to every interaction a student makes, both within and between lessons. This advanced technology enables the seamless integration of instruction and assessment before, during, and after each and every lesson. Individual in-the-moment learning experiences are deeply personalized for all types of students to provide the right next lesson, at the right level of difficulty, at the right time.

More than 50,000 data points are collected during every hour a student uses the DreamBox system. The Intelligent Adaptive Learning technology tracks each student interaction and evaluates the strategies used to solve problems. It then immediately adjusts the lesson and the level of difficulty, scaffolding, sequencing, number of hints, and pacing as appropriate. This allows students, whether struggling or advanced, to progress at a pace that best benefits them.

The platform combines a rigorous, research-based, pedagogically-sound curriculum aligned to the Common Core and state standards with a highly motivating learning environment. Gaming fundamentals are leveraged to motivate students to persist and progress, which leads to increased understanding and achievement.

A robust set of classroom and school-level reports that detail student usage and progress, as well as reports that group students by proficiency, give teachers and administrators insight into how students are moving through the curriculum, with up-to-date achievement levels against multiple standards. By using these reports, teachers are empowered to make appropriate instructional and intervention decisions, and individual student comprehension details can be easily shared with parents.

It's important to note that one-third of the "other" responses (33%) described technology-related challenges.

When asked to choose the level of adaptivity of their software, only 37% responded that their software was capturing student responses in an ongoing manner both within and between the lessons.

Value	Count	Percentage
Linear lesson sequence and assessment pre- and post-lesson	403	43.71%
Real-time and continuous adaptivity (instantaneously within and between lessons)	344	37.31%
Recommending lessons after direct instruction	126	13.67%
Other	49	5.31%

Asked to specifically rank various aspects of adaptive learning, respondents rated real-time and continuous adaptivity as the top feature.

Rank Average	Feature
8.94	Real-time and continuous adaptivity (instantaneously within and between lessons)
8.04	Recommending lessons after direct instruction
7.89	Linear lesson sequence and assessment pre- and post-lesson
6.65	Other

### Challenges for Non-users

The last part of the survey was directed to non-users of adaptive learning software. When asked to choose the reason that most closely aligns with their situations, more than half responded that a lack of funds was the primary reason they were not yet using adaptive learning programs.

Value	Count	Percentage
Lack sufficient budget	950	55.43%
Don't have necessary tech infrastructure	443	25.85%
We've tried software before and it didn't help	51	2.98%
Don't philosophically agree with use of technology or learning software	39	2.28%
Other	624	36.41%

Since more than a third responded that there were other reasons they are not using adaptive learning software, it is instructive to look at how those "other" answers break down:

Value	Count	Percentage
Lack of information or awareness	155	25.29%
Can't give a reason/don't know	114	18.60%
Not ready	73	11.91%
Don't want	48	7.83%
Investigating it now	47	7.67%

When queried about their intent to purchase, responses ranged from just over 10% who intend to purchase within the next school year to more than a third who currently have no plans to purchase in the future. However, 65% of these respondents expressed some intention to purchase within the next few years.

Value	Count	Percentage
No plans to use in future	599	35.01%
Within the next 1-2 years	539	31.50%
Sometime in 3+ years	388	22.68%
Within the next school year	185	10.81%

Given that schools and districts still struggle to provide high-speed bandwidth to their campuses, it is likely that a very real obstacle is the technology situation at individual schools. These issues can range from teacher discomfort with digital learning and lack of professional development to infrastructure and hardware challenges.

### **What Comprises Real Adaptive Learning?**

It is clear from the survey results that many respondents understand the ideal of adaptive learning programs—that they can deliver continuous and ongoing adaptivity, as the student is engaging in the program in real-time. But many of the software products respondents reported using have only limited elements of adaptivity and are not fully adaptive learning programs or platforms. For instance, some of the most frequently cited adaptive learning programs only include adaptive placement testing or assessment at the front end. This approach allows teachers to determine a particular course of instruction or practice, but does not continually adapt to answers as students use the program. The only other adaptive element is usually a periodic re-assessment where the teacher or the program can redirect a student’s activities based on the results of another assessment.

Some programs assert that they offer personalized and differentiated instruction, and they do to a certain extent. However, these are often test prep programs in which the activities are based on a separate assessment or multiple assessments that are pauses in the process. While a few of these programs can provide individualized learning paths, the teacher still plays a major role in determining where the student moves after an assessment. The survey results reveal that only a small portion of reported users are actually using programs with continuous and ongoing adjustments of content based on student responses in real time. Schools and districts that want to invest in technology that increases student achievement while increasing teacher productivity will want to carefully evaluate adaptive learning programs.

Here are some criteria to consider:

- Content is engaging, pedagogically sound, and motivating for students in order to encourage progress and ensure proficiency.
- There is continual and ongoing assessment that differentiates instruction in a personalized learning path within and between lessons in real time, resulting in a customized program for each student, based on their abilities.
- Student performance data is available to teachers on a continual basis so teachers can track achievement against curriculum standards. This increases teacher effectiveness and productivity.

## Conclusion

It is not surprising that some of the software in our schools is only partially adaptive. As stated at the outset, adaptive learning as a concept has been around for many years; however, technology always evolves over time. Many programs still in use were cutting-edge technology when they were first purchased by schools and districts. But as technology has grown more sophisticated, specifically in the algorithm functionality that is the basis of continual adaptation, not all programs have continued to evolve. They have adaptive elements, such as pre- and post-lesson assessments, but the software is not adjusting automatically as students input their answers. Continuous modification is the gold standard of fully adaptive learning software.

As the first K-12 survey on the use of adaptive learning technology, this report reflects a moment in time that provides benchmarks for how this technology is being used in schools and districts. As this technology evolves, *Tech & Learning* will continue to monitor its usage across the country.

### *About DreamBox Learning, Inc.*

DreamBox Learning was founded in 2006 in Bellevue, Washington, and launched its first online learning product in January 2009. DreamBox Learning Math has won more than 30 top education and technology industry awards and is in use in all 50 U.S. states and throughout Canada. The DreamBox Learning Math platform offers a groundbreaking combination of Intelligent Adaptive Learning™ technology, a rigorous elementary mathematics curriculum, and a highly motivating learning environment. DreamBox Learning Math captures every decision a student makes while working in the program and adjusts the student's learning path appropriately, providing millions of individualized learning paths, each one tailored to a student's unique needs. It is a platform designed to support teachers and their practice in every type of learning environment, off- or online. For more information about DreamBox Learning Math and the DreamBox Math for iPad app, please visit: [www.dreambox.com](http://www.dreambox.com).

### *About Tech & Learning*

For more than 30 years, *Tech & Learning* ([www.techlearning.com](http://www.techlearning.com)) has remained the premier publication and leading resource for education technology professionals responsible for implementing and purchasing technology products in K-12 districts and schools. This white paper was produced by NewBay Plus, *Tech & Learning's* marketing services arm, in collaboration with the T&L editorial team. For more information, please email Joe Braue at [jbraue@nbmedia.com](mailto:jbraue@nbmedia.com), or call 212-387-0467.