LEVERAGING DIGITAL CONTENT

to Differentiate Learning

Results of a New Research Study

project tomorrow

Understanding the New Era of Personalized Learning and Differentiated Instruction

> "I never teach my pupils. I only attempt to provide the conditions in which they can learn."
>
> **ALBERT EINSTEIN | SCIENTIST AND EDUCATOR**

As the 2016–17 school year begins, there is a growing expectation among students, parents, and teachers that learning experiences will be more personalized than ever before to meet individual student needs. Classrooms based upon this new expectation will be learning environments that foster ways to tailor instruction to the unique interests of learners with natural variations in method and pace, preference, as well as learning objectives and content. This shift from the traditional one-size-fits-none approach to teaching and learning that has been the standard in K–12 education, to a new kind of classroom that leverages both face-to-face and digital lessons results in a learning environment that is more relevant and personalized for students.

The catalyst for this shift in many classrooms is the increased access and use of digital content, which is changing the dynamics for both student and teacher. For the student, learning becomes engaging, interactive, and personalized to meet their needs. For the teacher, the ability to leverage digital content to implement differentiated instruction that is both rigorous and relevant for each student, supports new professional practices and a heightened sense of competency and impact. But is this vision for the new school year a tangible reality today or is it still merely aspirational?

Not all schools have yet fully actualized differentiated instruction and personalized learning within every classroom. However, there are a growing number of innovative school and district administrators on the forefront of changing this paradigm and using digital content to address the learning needs of all students. Findings from the 2015 Speak Up Research Project, conducted annually by Project Tomorrow®, provides evidence of this growing momentum around personalized learning and differentiated instruction. In tandem, education leaders, policymakers, and parents are embracing personalized learning as a key component for student success. Here is the most recent data revealing this momentum:

- In fall 2015, one-third of school and district leaders nationwide say that developing an individualized education plan for each student that includes personalized and differentiated learning paths is the best way to improve student academic achievement. In 2010, only one-fifth of education leaders said the same.
- 60 percent of school principals say that a primary benefit of using digital content within instruction is that it provides an efficient and effective way to personalize learning for each student. This represents a 33 percent increase in the number of principals sharing this belief compared to 2009.
- The impact of using digital content to personalize learning also involves enhanced access to information about students' strengths and weaknesses. According to 69 percent of district administrators, using student performance data to inform instruction results in positive academic results within their district classrooms.

- For the first time, a majority of parents (55 percent) want their child to be in a learning environment where the child has access to online resources that support self-paced learning.

The changing attitudes and aspirations of administrators are impressive, but the efficacy of personalized learning depends primarily on how the classroom teacher adopts and adapts the digital tools, resources, and content to differentiate instruction. To provide school and district administrators with new insights into how teachers are approaching this process, Project Tomorrow—in collaboration with DreamBox Learning®—conducted a study in the spring of 2016 that examined the views and values of classroom teachers using digital content within instruction. To provide a comparative analysis, the study included two groups of teachers: teachers who were using DreamBox Learning in their classrooms and who received specific professional development to support that usage, and teachers who were using a wide range of various other digital content products with associated training and/or professional development on those products. The study used methodology and instrumentation developed by Project Tomorrow as part of a National Science Foundation–funded research grant to evaluate the readiness of teachers to use digital content effectively within instruction (more information about the NSF study and the methodology are available at http://www.tomorrow.org/publications/TRAAC/index.html).

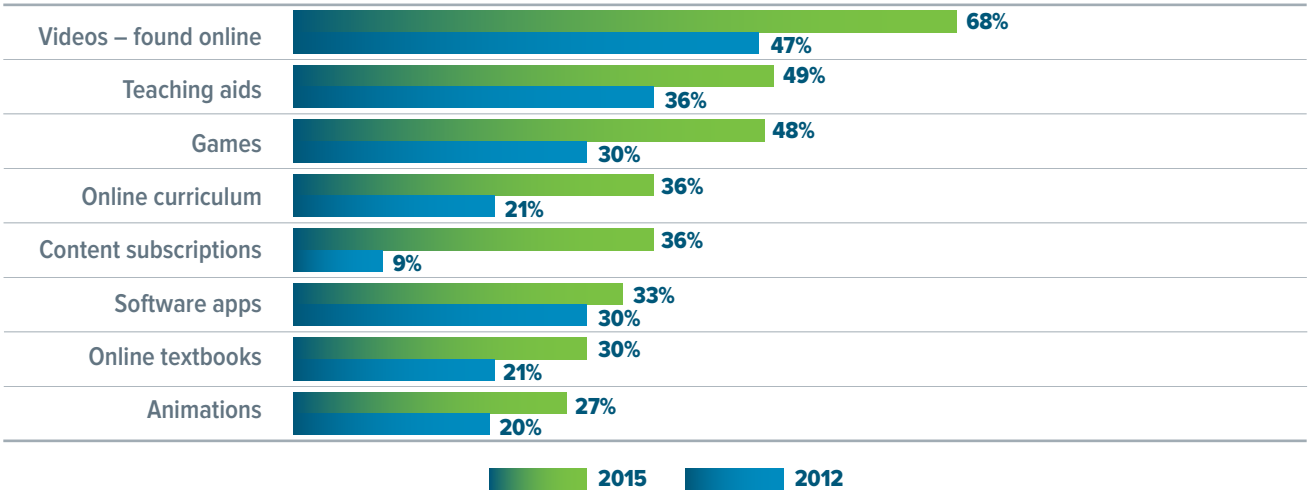
The findings from this new study provide education leaders with research-based information and classroom-based exemplars for how digital content enables personalized and differentiated learning environments. Some key findings discussed in this special white paper include:

- Teachers who have access to innovative, high-quality digital content and utilize that content on a regular basis within their classroom practices develop higher levels of confidence in their abilities to support students' learning goals with the effective use of digital tools.
- Evaluating the efficacy of using digital content within instruction cannot rely on increases in usage alone, but rather, administrators should examine how the content is used to personalize learning or differentiate instruction for all students as a more meaningful metric.
- Creating a school or district mindset that supports professional learning, both in school and out of school, can cultivate a culture of continuous skill development and improvement in teaching practices, especially using digital content.
- To be successful with differentiated instruction, teachers need access to high-quality digital content that provides them with information and data that they can use to understand the needs of each student, and to be able to tailor those learning progressions accordingly.

Study Results: Using digital content within classroom instruction

Teachers are increasingly using a wide variety of digital content within classroom instruction, especially when compared to just a few years ago, according to the 2015 national Speak Up research findings. For example, the number of teachers using digital curriculum within their classrooms jumped over 70 percent in just three years. Teachers' use of game-based learning environments has also experienced significant growth, especially among elementary teachers. Figure A documents this trend of increasing teacher usage of digital content in the classroom.

Figure A: Growth in teacher use of digital content in classroom instruction for years 2012 and 2015



Source: Project Tomorrow 2016

Beyond the trend line of increased usage, it is also important to examine how digital content enables new or more efficient instructional practices and supports instructional quality transformation. The teachers using the DreamBox Learning solutions provided interesting insights into this question. The cohorts of teachers who had implemented DreamBox Learning Math identified their most common practices associated with integrating digital content into instruction, and the frequency of those practices. Their responses as depicted in Table A indicate a heightened sophistication in their use of the technology to support various instructional goals. DreamBox teachers exemplifying these more sophisticated behaviors outpace the national teacher pool that was part of this study by a statistically significant percentage in every category.

Table A: Ways DreamBox teachers use digital content within instruction

Instructional Practices with Digital Content	% of Teachers using DreamBox who say this is a regular practice	% of Teachers not using DreamBox who say this is a regular practice
I use digital resources to reinforce concepts	100%	87%
I use digital resources to introduce new concepts or topics	61%	42%
I use digital resources to plan my lessons	54%	44%

Three factors contributed to these more mature practices by the DreamBox teachers. These factors are:

1. **More frequent use of digital content** within classroom instruction; increased usage enables greater opportunities for teachers to develop proficiency and to see firsthand the impact of digital content on their students' learning potential.
2. **Higher levels of confidence** in their abilities to match digital resources to learning goals, a process that is foundational for personalized learning and implementing differentiated instruction.
3. **Taking advantage of professional learning opportunities,** both formal and informal, to improve professional skills.

The mindset to take advantage of professional learning from a variety of sources is a key differentiator within the sub-cohort of the DreamBox teachers. Such a mindset is often a reflection of a school or district culture that supports innovative uses of digital tools, not just for instruction but for professional learning as well. This finding is supported by research undertaken as part of the three-year teacher readiness study conducted by Project Tomorrow with support from the National Science Foundation. That study provided tangible evidence that highly successful implementations of digital content, resources, and tools within classroom instruction were dependent upon several factors that worked in conjunction with one another. For example, to have relevancy, effective professional development to support the meaningful use of digital content must be interwoven with strong curricular planning, teacher voice and empowerment in their own learning experiences, connections to best practices, and be rooted in real time, real-world classroom instruction. Schools and districts that appreciate this tight connection between effective practices and relevant professional learning are exemplars of this new culture and mindset for digital learning integration.

Leadership Insights:

While increased usage of digital content and resources can be a harbinger for the purposeful integration of technology within learning, the more meaningful measure is how the teachers actually use digital tools within instruction. When observing in classrooms, administrators should specifically look for examples of how digital content is used to differentiate learning, not just to engage the class in a whole-group learning activity. Creating a school culture that supports professional learning for teachers, both in school and out of school, can result in increased teacher confidence in their instructional practices and a mindset for continued improvement. Step one in this process of developing such a culture is often to listen to what teachers say they need to develop greater proficiency and confidence in using digital tools to differentiate learning. On a national level, planning time with colleagues, and professional development on how to differentiate instruction and create meaningful formative assessments, are top vote-getters each year in the national Speak Up research study.

Study Results: Creating differentiated learning experiences using digital content

In parallel with teachers' greater usage of digital content nationwide as reported by the Speak Up research findings, teachers also report enhanced effectiveness as an educator because of the use of digital tools, content, and resources within their classrooms. The most significant enhancement has been in their ability and skill to differentiate instruction. Whereas in 2013, only 24 percent of teachers said that digital content enabled them to differentiate instruction, more than twice that number of teachers (55 percent) in 2015 identified that ability as a key impact of digital content usage, which represents a significant study finding. Following this trend, an even greater percentage (64 percent) of the study group of teachers using DreamBox Learning® solutions said that digital content empowers them to differentiate instruction.

In an effectively differentiated classroom, it is understood that:

- Students differ as learners in terms of background experiences, culture, language, gender, interests, readiness to learn, modes of learning, speed of learning, support systems for learning, self-awareness as a learner, confidence as a learner, independence as a learner, and a host of other ways.
- Differences profoundly impact how students learn and the nature of scaffolding they will need at various points in the learning process.
- Teachers have a responsibility to ensure that all of their students master important content.
- Teachers have to make specific and continually evolving plans to connect each learner with key content.
- Teachers are required to understand the nature of each of their students, in addition to the nature of the content they teach.
- A flexible approach to teaching "makes room" for student variance.
- Teachers should continually ask, "What does this student need at this moment in order to be able to progress with this key content, and what do I need to do to make that happen?"

Leading and Managing a Differentiated Classroom by C. A. Tomlinson and M. B. Imbeau, ASCD, © 2010, pp. 13–14.

Differentiated instruction is a system of instruction that focuses on the needs of the individual student, providing opportunities for each student to utilize the same classroom curriculum but individually tailoring learning goals, tasks, and outcomes.

Whereas this high degree of individual student focus may represent a significant departure from traditional instructional practices, examples of how teachers are leveraging digital content to differentiate learning can provide valuable insights for school and district leaders. Table B illustrates how teachers using DreamBox solutions are actualizing differentiated instruction. Comparatively with national teachers, a statistically significant percentage of DreamBox teachers are already leveraging digital content to differentiate instruction. For example, while only 29 percent of the teachers in the national teacher pool are using data derived from digital content usage to understand student learning needs on a real time basis, 84 percent or almost three times as many DreamBox teachers are already doing that.

Table B: Ways DreamBox teachers are differentiating instruction using digital content

Differentiated Instructional Practices	% of Teachers using DreamBox who say this is a regular practice	% of Teachers not using DreamBox who say this is a regular practice
Using digital content data to better understand individual student needs, learning processes, and areas for supplemental help	84%	29%
Personalizing learning by encouraging students to use digital resources independently and to self-direct their learning processes	73%	33%
Adapting digital resources to meet specific learning needs of individual students	52%	33%

Additionally, as further indication of the impact of their more sophisticated and mature use of digital content on their instructional practices, DreamBox teachers regularly think beyond traditional student groupings for instruction, and take advantage of digital resources and the data derived from those resources, to structure classroom learning using a more individualized or differentiated process. More than one-third of the teachers said they are using data reported from digital content to regularly create new and different strategy groupings with a goal to provide the optimum learning experience for each individual student.

Leadership Insights:

Getting beyond lip service on personalized learning, differentiated instruction requires a fundamentally different approach to the classroom experience. To differentiate instruction efficiently and effectively with digital technology, teachers need a comprehensive set of high-quality, standards-based digital content, tools, and resources that provide them with the data and information they need to actuate the individualized learning experience. Additionally, as discussed earlier, teachers need professional learning opportunities tailored to their individual needs and classroom environment as well. A third critical component is the support of the school principal and district or central office staff. Correspondingly, many school and district administrators are more interested today in understanding what their teachers need to personalize learning. This list of needs varies and is dependent upon classroom, school, or even community environments. Beyond the basics of a reliable technology infrastructure, teachers also would like their administrators to understand the value in collaborative planning time with peers, and in-school coaching on effective digital content use and classroom practices. Additionally, teachers are very interested in professional development on how to identify and evaluate high-quality digital content solutions. With these new conditions in place, schools and districts have more potential than ever before to achieve the promise of providing personalized and differentiated instruction for every child to be successful.

Ending Thoughts

The goal of this study, facilitated by Project Tomorrow in collaboration with DreamBox Learning®, was to provide school and district administrators with new insights as to how teachers are using digital content currently to differentiate instruction, and what additional supports are needed to increase the efficacy of that learning environment. The findings explained in this paper reveal four key insights for administrators.

1. The regularity of teacher usage of digital content increases teachers' familiarity with the solutions and their self-confidence to be effective with those resources.
2. While the amount and regularity of usage certainly matters, what is more important is how teachers are using the digital content resources. The key objective for administrators is therefore to support teachers' use of digital content to purposefully personalize and differentiate instruction for each student.
3. To be able to differentiate instruction effectively, teachers need access to high-quality digital content that not only provides meaningful student experiences, but also supplies the teacher with timely data and information to understand students' progress paths, strengths, and areas for remediation.
4. Professional learning plays an increasingly critical role in this process. The best professional learning to support teachers' use of digital content to differentiate instruction, however, is one that is bolstered by a school or district culture that is laser-focused on creating optimal environments for student learning.

About Project Tomorrow

Project Tomorrow is a global education nonprofit organization dedicated to ensuring that today's students are well prepared to become tomorrow's leaders, innovators, and engaged citizens of the world through the effective use of science, math, and technology resources for learning. With 20 years of experience in education, Project Tomorrow regularly provides consulting and research support around key trends in digital learning to school districts, government agencies, business, and higher education institutions.

Project Tomorrow's Speak Up Research Project annually polls K–12 students, parents, educators, and community members about the role of technology for learning in and out of school, and represents the largest collection of authentic, unfiltered stakeholder voice on digital learning. Since 2003, 4.5 million K–12 students, parents, teachers, librarians, principals, technology leaders, district administrators, and members of the community have shared their views and ideas through Speak Up.

For the special study discussed in this white paper, data from three distinct collection efforts were analyzed to prepare the findings. Data utilized included results from the Speak Up 2015 online surveys completed by 35,909 teachers nationwide in fall 2015. Additionally, over a three-year period from 2012 to 2015, 3,497 teachers nationwide completed an online survey about their readiness to use digital content as part of the aforementioned NSF-funded study. That same instrumentation was used in spring 2016 to collect data from 189 teachers using DreamBox Learning solutions.

About DreamBox Learning

At DreamBox Learning®, we're passionate that every child should have access to a learning experience that motivates them to persist, progress, and achieve success for a lifelong confidence in math and in life. We believe all children can excel at learning, no matter where they start, where they live, or who they are. Along with district administrators, teachers, principals, and parents, we are dedicated to helping children realize their potential.

Students learn best when they're challenged and motivated, and that is what they experience inside DreamBox Learning® Math, which provides a deeply personalized learning experience that guides and engages students at all levels. The DreamBox difference is the combination of a rigorous K-8 math curriculum and a motivating learning environment that work seamlessly with our Intelligent Adaptive technology, which adapts to provide feedback and scaffolding in the moment of learning and over time. More than 2,000 lessons are provided in English and Spanish to over 2 million students in the U.S. and Canada. Students using DreamBox develop the strategies, critical thinking skills, deep understanding, and reasoning abilities they need to achieve success. Our cloud-based, cross-platform tool is effective in the computer lab, with small groups, or in a flipped classroom model with scaffolding support that closes gaps and gets students to math mastery.

DreamBox has won more than 40 top education and technology industry awards and has 10 years of research-based, proven success validated from Harvard University and SRI. We are most proud of our ultimate reward: students who understand and love math.