

Blended Learning Innovations: 10 Major Trends

DreamBox Learning, Inc., in partnership with Getting Smart



WHITE PAPER



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Introduction

This paper provides a snapshot of some of the dominant trends in the ever-evolving blended learning landscape, and takes a look at how innovative approaches are boosting achievement in elementary mathematics classrooms. The most important trend we see is a shift toward placing students firmly at the center of the learning process, enabled by blended learning approaches, and as this paper will show, there are multiple reasons to adopt this new paradigm.

A major influence that is driving this change results from acknowledging the reality of the way we live today. We can no longer ignore the ubiquity of technology—we must to welcome it into our classrooms and learning activities. To inspire engagement, we need to keep pace with students who operate in an increasingly mobile world where information and communication are accessed 24/7 through smartphones, laptops, and tablets.

We also need to meet the needs of students with different requirements, learning styles, and backgrounds in classrooms with 20, 30, or even 40 students in an environment that demands results. There is mounting evidence that

complementing or replacing lectures with student-centric, active learning strategies and learning guidance—rather than memorization and repetition—improves learning, supports knowledge retention, and raises achievement.¹ These new student-centered methods are a way to connect with every student right where they are and support progress toward grade-level standards, while we continue to cultivate development of the whole child.

All of the ongoing advances and refinements in student-centered blended learning have the same aim: to prepare children for success in a rapidly evolving, globalized world driven by information technology. The future our children will inherit demands technological dexterity, the ability to think critically, and the development of flexible intelligence that will thrive in—and drive—change.

The main objective of a student-centered classroom is to create an environment and deeply engaging experience so that each child can actively participate in his or her own learning experience.

BLENDED LEARNING TRENDS	
#1	The deeply student-centered learning experience
#2	Soaring numbers of digital learners
#3	Supporting standards and higher-order thinking skills
#4	Realizing benefits for both teachers and students
#5	Data-driven instruction to personalize learning
#6	Personalized learning accompanied by a lean, blended, iterative approach
#7	Productive gamification
#8	The mobile world is where learners live now
#9	BYOD is here and key to active three-screen days
#10	More broadband, please!

TREND #1: THE DEEPLY STUDENT-CENTERED LEARNING EXPERIENCE

As teachers and administrators innovate to provide children with the skills and thinking abilities they will need to be successful in a highly competitive, globalized 21st century workplace, a new approach is gaining traction: student-centered learning. This approach diverges from the old teaching paradigm, because it focuses on student engagement and active learning by encouraging collaboration between teachers and students. Rather than lecturing, educators structure teaching around the individualized learning needs of each student, by using and being supported by technology.

The main objective of a student-centered classroom is to create an environment and deeply engaging experience so that each child can actively participate in his or her own learning experience. As the Charter School Growth Fund’s Alex Hernandez has written: “Students who ‘own’ their learning speak and act differently about their education. They know what they are trying to get out of every lesson, are motivated to do it, and are critical thinkers about the methods used to get there.”²



The student-centered difference

These skills—enhanced with high-quality, relevant, domain-specific digital content—form a strong learning foundation to help today’s students become nimble, adaptive thinkers and doers who will thrive in a complex future.

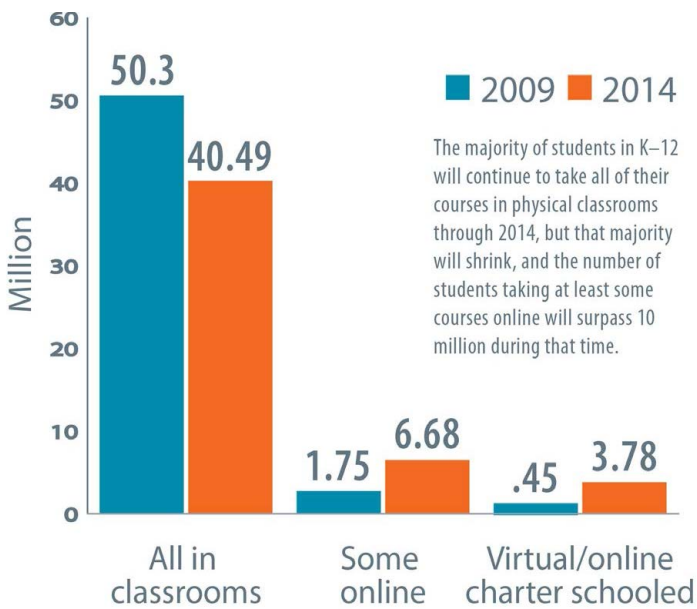
<i>Teacher-centered</i>	<i>Student-centered</i>
Traditional	Progressive
Standards-driven	Curriculum-driven
Factory model	Inquiry model
Breadth	Depth
Single subjects and grade level focus	Thematic and real world applications
Depth	Breadth
Focus on product	Focused on process
Process-and product-oriented	Product-oriented
Short time on each concept	Block scheduling and cross curricular activities
Rote knowledge	Experiential knowledge

Source: Barbara Bray³

Creating a more powerful learning experience. A recent policy paper from the Center for 21st Century Skills, “Exploring Student-Centered Pedagogical Strategies to Promote a Technology-Enhanced Learning Environment”⁴ endorses combining face-to-face instruction, computer-mediated learning, authentic experiences, proficiency assessments, and reflective practices for a more powerful learning experience. It’s an approach that helps students develop the critical 21st century skills of information literacy, creativity and innovation, collaboration, problem solving, communication, and responsible citizenship. These skills—enhanced with high-quality, relevant, domain-specific digital content—form a strong learning foundation to help today’s students become nimble, adaptive thinkers and doers who will thrive in a complex future.

TREND #2: SOARING NUMBERS OF DIGITAL LEARNERS

Education is going virtual



Adapted from Ambient Insight.⁵

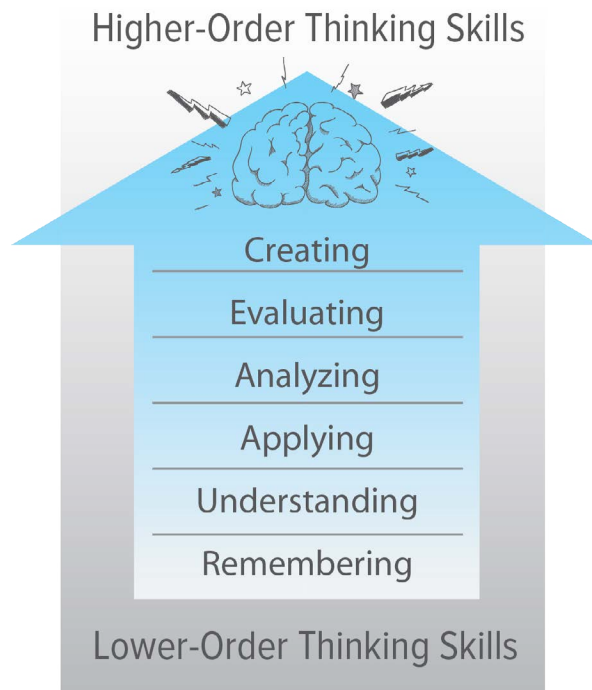
The number of students taking online classes keeps increasing. Projections are that users will soar to 10 million users this year. Even that huge number may be a conservative estimate with the proliferation of free e-learning resources such as [Massive Open Online Courses](#) (MOOCs).

Schools are here to stay. While the [National Education Association](#) (NEA) believes that quality distance education can create and extend learning opportunities, it provides clear ideas about its use. For example, the thinking is that it shouldn't be an alternative to convening students in a traditional classroom because younger learners need to be in school and socializing with other students.⁶ It isn't supportive of full-time online learning programs for children through eighth grade. The NEA believes teachers who provide online learning should be licensed, and that the best online courses have a balance of face-to-face time and online instruction.⁷

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TREND #3: SUPPORTING STANDARDS AND HIGHER-ORDER THINKING SKILLS



The Common Core State Standards require students to demonstrate a deeper understanding of math concepts and higher-order thinking, and for teachers to approach teaching in a different way as well. The new standards call for significant changes in the early grades—CCSS for kindergarten through third grade math also require students to demonstrate a greater depth of understanding than needed under the previous California State Standards, established in 1997. While the old standards were often criticized for an excessive reliance on memorizing certain facts or procedures, the new standards routinely call for students to solve problems that require a strong grasp of mathematical concepts and to explain their reasoning.

Adapted from Barbara Bray, *Moving to Student Centered Classrooms*.⁸

Overview of progression. A progression describes a sequence of increasing sophistication in understanding and skill within an area of study. The diagram below illustrates how the domains are distributed across the CCSS for Mathematics.⁹

Common Core State Standards for mathematics domains

K	1	2	3	4	5	6	7	8	HS
Counting & Cardinality									
	Number & Operations in Base Ten					Ratios & Proportional Relationships			Number & Quantity
			Number & Operations-Fractions		The Number System				Algebra
	Operations & Algebraic Thinking					Expressions & Equations			Algebra
	Operations & Algebraic Thinking							Functions	Functions
	Geometry								Geometry
	Measurements & Data					Statistics & Probability			Statistics & Probability

Adapted from State Standards Initiative Common Core¹⁰

“Drill and kill” is dying. Math is really about application and problem solving. By removing memorization standards and requiring teachers to cover fewer topics over the course of a year, the new standards are also meant to encourage teachers to spend more time teaching underlying mathematical concepts. The “drill and kill” method to prepare students for former state standardized tests—drilling students repeatedly on specific skills without spending much time explaining the underlying concepts—should be a thing of the past for those learning and teaching to the new standards.

Digital elementary math supports the CCSS. Dr. Cathy Fosnot, Professor of Childhood Education at the City College of New York and at the Graduate Center of the City University of New York, and author of *Contexts for Learning Mathematics*, offers guidelines for the selection of digital elementary math programs. She advises that selected programs take the Standards of Practice seriously and provides professional development within it, so that teachers learn as they use the materials. Dr. Fosnot stresses that the program itself should hold crafted sequences to support progressive development. She is a proponent of DreamBox Intelligent Adaptive Learning™ because it offers continuous formative assessment, along with a rigorous math curriculum that supports the CCSS. It also offers a seamless home/school connection, and choices to personalize learning.¹¹

Planning for coming assessments. Dr. Francis (Skip) Fennell, inaugural recipient of the L. Stanley Bowlsbey Chair in Education and Graduate and Professional Studies, and one of the contributors to the Common Core State Standards for Math, suggests that while educators need to respect the influence the Partnership for Assessment of Readiness for College and Careers (PARCC) and Smarter Balanced Assessments coming in 2015 will have on curriculum and instruction, there shouldn't a narrow focus on testing. Teachers and specialists need to work with the standards in ways that doesn't reduce them to a checklist of vaguely connected ideas, but think about the progression in understanding and skill (in the chart above) and use formative assessment to guide practice. He also provides task resources, including¹²:

- [Illustrative Mathematics](#)
- [Institute for Mathematics and Education](#)
- [The Mathematics Common Core Toolbox](#)
- [PARCC Educator Leader Cadre Portal](#)
- [Smarter Balanced Scientific Sample Pilot Test Portal](#)

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Best practices are still evolving. “The Center for Digital Education sees that schools everywhere are grappling with the rather vast new frontier of blended and virtual learning,” said Leilani Cauthen, Vice President of the Center for Digital Education, in a letter to readers. “As such, we wanted to start defining the territory.”¹³ The Center for Digital Education covers trends in the ed-tech world and publishes special reports on education technology every quarter to help educators negotiate the ever-changing terrain of blended learning, how to implement it, and where it’s going.

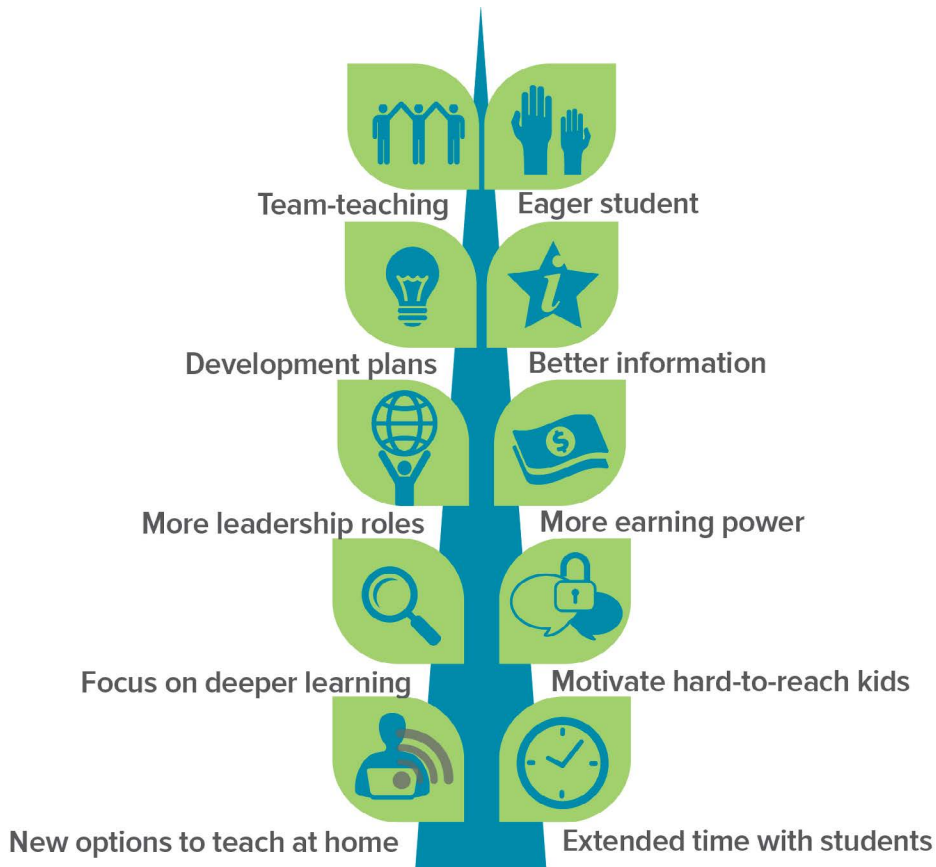
There are many reasons to adopt blending learning, particularly in an elementary school setting, as Tom Vander Ark details in the white paper, “Making Math Work: K–8 Blended Learning”—to meet challenges, personalize learning, and strengthen teaching.

Change and flexibility are the watchwords. iNACOL states that online learning enrollments are growing by 46 percent per year.¹⁴ As adoption increases, blended learning models are being redefined. The current models of blended learning¹⁵—Rotation and its subsets, Flex, À La Carte, and Enriched Virtual—that have been identified by the Clayton Christensen Institute for Disruptive Innovation are still evolving to meet the needs of both teachers and their tech-savvy students, from simply adding more technology in traditional classrooms to creating robust online education experiences. There are many reasons to adopt blending learning, particularly in an elementary school setting, as Tom Vander Ark details in the white paper, “Making Math Work: K–8 Blended Learning”—to meet challenges, personalize learning, and strengthen teaching.¹⁶

TREND #4: REALIZING BENEFITS FOR BOTH TEACHERS AND STUDENTS

Blended learning can provide an answer to the challenges of teaching (identified by teachers in the 2013 MetLife Survey of the American Teacher: Challenges for School Leadership) from implementing new standards like the Common Core, and new assessments, while meeting the needs of a diverse and growing student population. The good news is that blended learning can help meet those challenges in 10 important ways.

10 benefits of blended learning for teachers



Adapted from Digital Learning Now, Improving Conditions and Careers, 2013¹⁷

Digital learning improves career opportunities for teachers. “Improving Conditions and Careers: How Blended Learning Can Improve the Teaching Profession,”¹⁸ details how teachers’ professional opportunities are improved by blended learning in three key ways:

- The implementation of blended learning to “extend the reach” of excellent in-person teachers to more students and to teaching peers.
- The ability to teach remotely, allowing great teachers to reach students anywhere and to have more flexible careers.
- The opportunity for “boundless instruction” and expanded impact through online sharing of teacher-created content.

Nothing can ever replace a good teacher. As U.S. Secretary of Education Arne Duncan so rightly said recently, “Technology alone isn’t going to improve student achievement. The best combination is great teachers working with technology to engage students in the pursuit of the learning they need.”¹⁹

“If your data collection is not providing the information you need to drive continuous improvement in the classroom, see which best practices you can beg, borrow, and copy from districts that are forerunners in data management.”

TREND #5: DATA-DRIVEN INSTRUCTION TO PERSONALIZE LEARNING

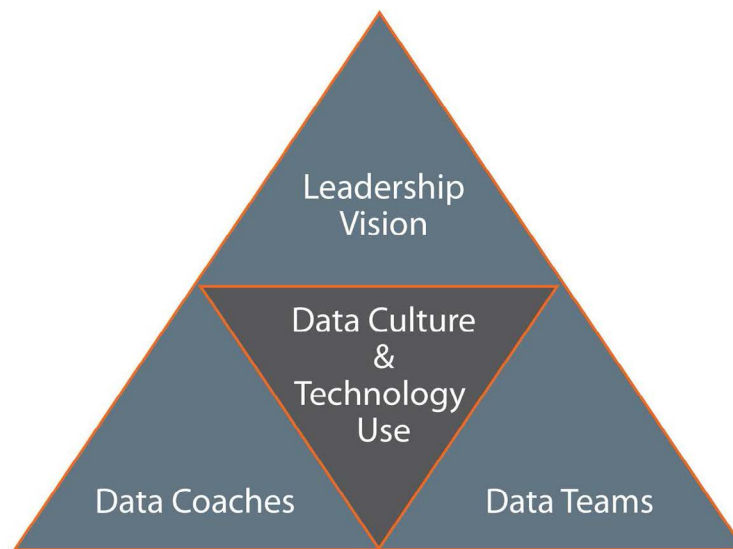
U.S. Secretary of Education Arne Duncan, a proponent of data-driven decision making in education, urged at an American Association of School Administrators Conference, “If your data collection is not providing the information you need to drive continuous improvement in the classroom, see which best practices you can beg, borrow, and copy from districts that are forerunners in data management.”²⁰

In a recent policy report, the New American Foundation notes that since the No Child Left Behind (NCLB) act was passed in 2001, states have been compelled to develop more sophisticated methods of tracking information.²¹ Every state as of 2012 has at least the foundation for a system. However, most states do very little to train teachers and administrators in how to use this data to inform and improve classroom instruction. That’s beginning to change now, with a number of Blended Learning Certificate Programs now available through associations, MOOCs, and government programs, like the [Blended Learning Institute](#), part of the New York State Department of Education’s iZone program.

Real-time data is most effective to meet student needs and state standards.

Research has shown that if curricula and instruction plans at all levels—county, district, classroom, and for the individual student—are based on information gathered from assessments, the probability that students will attain desired learning outcomes increases.

A framework for data-driven decision making in education



Adapted from Sharnell Jackson, “Data-Driven Decision Making in Mathematics Education.”²²

Establishing a data-driven culture. Sharnell Jackson, President of Data-Driven Innovations Consulting, Inc. describes a research-based critical framework in the white paper, “Data-Driven Decision Making in Mathematics Education” that contains five elements to facilitate more informed practices, accelerate overall school performance, and improve student achievement.²³

Jackson emphasizes that success depends on leadership that creates an effective vision based on teachers' adoption of a systemic data-driven process that includes blended learning tools and strategies with the ultimate goal of meeting the personalized learning needs of each student.²⁴

The primary role of school and district leaders in a data-driven instruction framework is to provide a vision: define the purpose, set expectations for data use, and build agreement within the school.

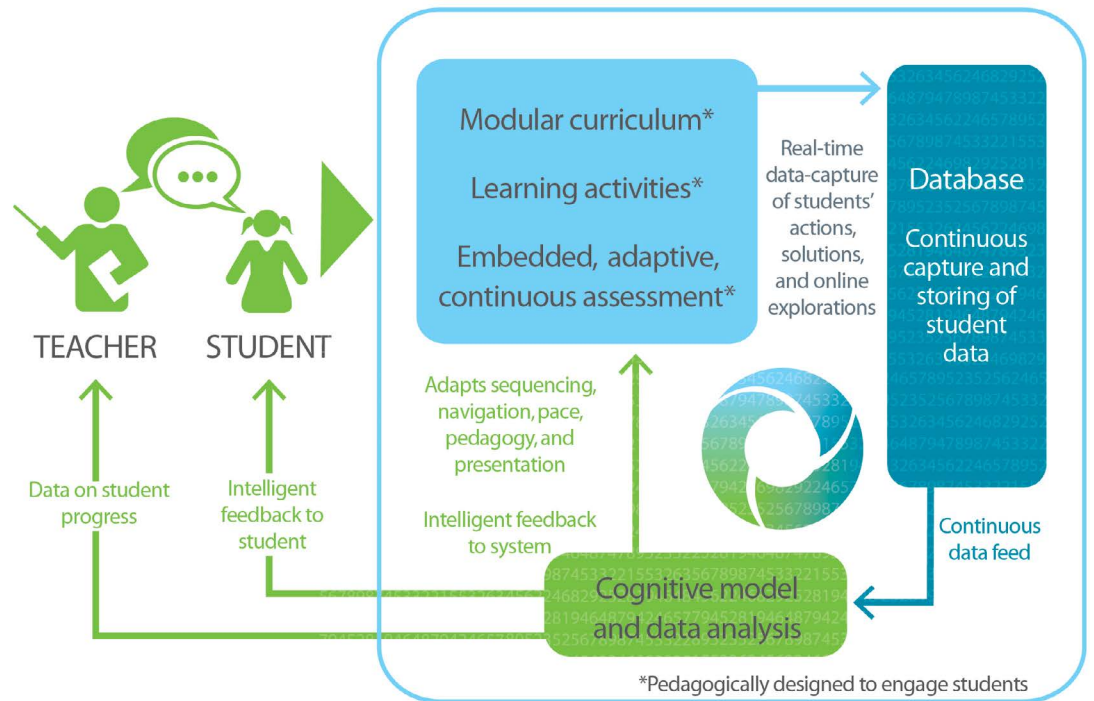
1. **Leadership.** The primary role of school and district leaders in a data-driven instruction framework is to provide a vision: define the purpose, set expectations for data use, and build agreement within the school. Leaders who are uncomfortable or incapable of modeling data use because of a lack of knowledge and skills—or lack of interest or motivation—should recognize their limitations and employ a model of distributed leadership (e.g., by appointing a data coach) to empower school staff members to effectively use data.
2. **Data coaches.** A data coach is the knowledgeable “go to” person who takes responsibility for integrating data and modeling school data use.
3. **Data teams.** Using data in the classroom is essential, but equally important is allotting time for teachers to learn from each other. Collaboration is a vital component in the implementation of data-driven practices, such as discussing pressing problems around student learning, or working together to find possible instructional strategies to remediate student-learning concerns.
4. **Data Culture and Technology.** Jackson also describes the steps needed for developing a data-driven culture that fully utilizes technology for the benefit of teachers and students:
 - Enculturate the notion of continuous improvement
 - Build support from stakeholders
 - Strengthen collaboration
 - Empower a data coach
 - Organize a data team
 - Create time for collaboration
 - Provide timely access to data

Continuous formative assessment. Groundbreaking real-time data collection technology such as Intelligent Adaptive Learning^{TM25} supports continuous formative assessment. It accumulates data every time the learner engages with a program and by encoding the interaction, instruction is informed in a way that is dynamic, rather than static or based on tests that are weeks or months apart. By mining data continuously—by collecting data and compiling it—it is possible to gain a full picture of what the child actually knows. By then sharing that with both teachers and parents, instruction is truly informed.

Intelligent Adaptive Learning drives continuous formative assessment. Cheryl Lemke of the Metiri Group, describes the five critical factors that make up how the Intelligent Adaptive Learning system works to provide continuous formative assessment in the white paper, “Intelligent Adaptive Learning: An Essential Element of 21st Century Teaching and Learning”²⁶:

1. Content in the form of lessons or activities in which the learner engages in a sequence unique to his needs
2. Instructional strategies that teach and guide the learner
3. Measurements of the effect of the student toward the learning
4. Mechanisms for measuring and understanding what the student does or does not know
5. Feedback mechanism whereby the data acquired about the learner informs the next round of content, instruction, and motivation the student encounters

Intelligent Adaptive Learning feedback mechanism



Adapted from DreamBox Learning, Inc. Adaptive Learning Guide²⁷

Adaptive Learning Technology and the data it collects helps students experience the personalized learning that schools would like to provide, but may have difficulty delivering as classroom sizes increase and budgets decrease.

TREND #6: PERSONALIZED LEARNING ACCOMPANIED BY A LEAN, BLENDED, ITERATIVE APPROACH

Many people talk about student-centered learning, but taking it seriously requires big changes—new tools, new approaches, and a new mindset. A Next Generation Learning Challenge judge said, "Personalized learning starts with reimagining the student experience—not current system constraints."²⁸

Borrowing lessons from other sectors and the promising practices of the best operators in education, next-generation personalized learning models are usually accompanied by:

- Blended learning environments
- Lean operations
- Iterative development

Lean operations. According to the Lean Enterprise Institute, “lean means creating more value for customers with fewer resources.”²⁹ A lean organization understands value and focuses its key processes to continuously increase and improve it. Lean thinking changes the focus of “management” from optimizing separate technologies, assets, and vertical departments to optimizing the flow of “products and services” through entire value streams that flow horizontally across technologies, assets, and departments to users. Lean is not a program or short-term cost reduction program, but a paradigm for entity operation.

Lean schools allocate a high percentage of their budget to classrooms and they invest in productivity producing tools and initiatives. They use design thinking to reconsider everything in their quest to optimize learning. For examples, see [10 ways students could co-create customized learning pathways](#).³⁰

[Reynoldsburg City Schools](#) in Columbus, Ohio is a great example of a district that has rethought [strategy, structures, and systems](#) to transform its schools and create new student learning pathways.

Iterative development. The [lean startup](#) methodology has transformed how new products are built and launched. While common among education technology startups, iterative development strategies are also being used by some school networks. [Summit Public Schools](#) in the Bay Area and Michigan’s [Education Achievement Authority](#) are simultaneously iterating on school models and learning platforms. Summit opens at least one new school each year and each school reflects a new version of the school model and platform. Combined organizational design with technology design is yielding promising results in both cases.

Following is a summary of all three dimensions—a reflection of new tools, new approaches, and a new mindset.



Organizational design combined with technology design

	<i>Traditional</i>	<i>Lean, Blended, Iterative</i>
Strategy	Implementation oriented	Hypothesis-driven experimentation
Experience	Step by step plan	Test, hypothesis, iterate
Design	Prescribed	Flexible, 90-day cycles of innovation
Communication	Top down	Frequent shared reflection
Organization	Departments, individuals	Problem solving teams
Development	PD to support plan	Continuously developing mindset/skills
Evaluation	Year-end results	Real-time data informs decisions
Failure	Avoided	Expected: fix it, iterate

Adapted from Reynoldsburg City Schools.³¹

TREND #7: PRODUCTIVE GAMIFICATION

Using games to promote learning isn't a new idea. But the widespread use of game-based adaptive learning systems, the explosion of mobile learning applications, and the growing use of game-based strategies makes gamification one of the most important education trends of this decade. According to Teachers College, gamification is the use of game mechanics and dynamics such as badges, leaderboards, and actions to improve motivation and learning in informal and formal settings.³²

Clarifying related terms. There is a difference between gamification and game-based learning. In the classroom, the syllabus is gamification—it is a system of points that is designed to motivate engagement in the classroom. Game-based learning is how teachers use games and play to convey content. For more information, take a look at "Gamification vs. Game Based Learning in Education."³³

Pervasive use. Ranging from occasional mobile game play, to scheduled weekly time in an adaptive system, to an entire school like Quest to Learn which is organized around gamification principles, it's likely that games and/or gamification are part of the learning experience for most U.S. K–12 students. And while widespread use of digital learning games and game-based strategies is relatively new, eight principles of productive gamification are emerging:

1. **Conceptual challenges.** Good games incorporate rigorous pedagogy and engaging challenges that promote deeper conceptual learning rather than trivial fact recall. Good games are learning tasks—not entertainment interrupted by learning quizzes. Good games are aligned to widely respected standards making it easier to combine with other forms of instruction and assessment and ensure coverage of key concepts.

“One of the exciting things that leaps out to me when reading the new Common Core State Standards for mathematics is that the spirit of inquiry and curiosity is back, hardwired into a document that will likely form the basis for mathematics teaching and learning for a long time,”³⁴ said game developer Nigel Nisbet.

2. **Productive failure.** Good games encourage supported failure with instructional feedback. Mental models take lots of practice and feedback to develop. Children learn by creating and testing hypotheses and receiving useful feedback.
3. **Careful calibration.** Productive learning systems locate and maintain the zone of proximal development—the gap between what a student knows and what he or she can achieve. Good games are well calibrated—not so easy that they create boredom and not so difficult that they produce frustration.
4. **Boosts persistence.** Dr. Jane McGonigal, author, researcher, and game proponent notes that the mindset of gaming—the willingness to fail and keep trying—boosts resilience, persistence, and in and of itself prepares students in the virtual world to deal better with real-world challenges. Some teachers track team progress on big projects on an interactive whiteboard—an interesting combination of project management tools, a pacing guide, and the competitive effect of a leaderboard.
5. **Builds confidence.** Elizabeth Corcoran, founder of Lucere, an organization devoted to helping educators find and use the most appropriate technology for inspiring students, notes that one of the main benefits of gamification is that it helps students gain confidence as they learn how to have a winning learning experience, and makes them hungry for tools that put them in control. Good games and game-based strategies build a sense of agency and efficacy.
6. **Enhances intrinsic motivation.** Gamification engages and motivates students while developing problem-solving skills and a sense of accomplishment thanks to continuous feedback and rewards. Cristina Ioana Muntean notes that good games and game-based strategies don’t “replace the intrinsic motivation of [a] student, which is stronger and more long term, with the extrinsic one, but offer a combination of the two for a better performance.”³⁵
7. **Accessibility.** In a good game, teacher Dave Guymon says there is a need for “every player [to have] equal access to resources and information” and, while progress may vary, “there is a continual opportunity to learn skills to mastery at all levels.”³⁶ He added, “Like good game designers, teachers must structure the learning environment and process to offer equal access to the information and resources needed by our students to succeed in learning.”
8. **Deeper learning.** “Some innovative game-based and adaptive-learning programs embed key elements of performance assessment,”³⁷ said Tim Hudson, Senior Director of Curriculum for DreamBox Learning, Inc. “These programs present students with new and unfamiliar situations that require them to engage in critical thinking and strategic problem solving to accomplish challenging and meaningful goals.”

Gamification common in mathematics teaching. Mike Flynn, director of Mathematics Leadership Programs at Mount Holyoke College said, “We must give our teachers and students room to explore the area of mathematics so that math is no longer about memorizing procedures, but about developing strong mathematical ideas and understandings that benefit students for life, not just one test.”³⁸

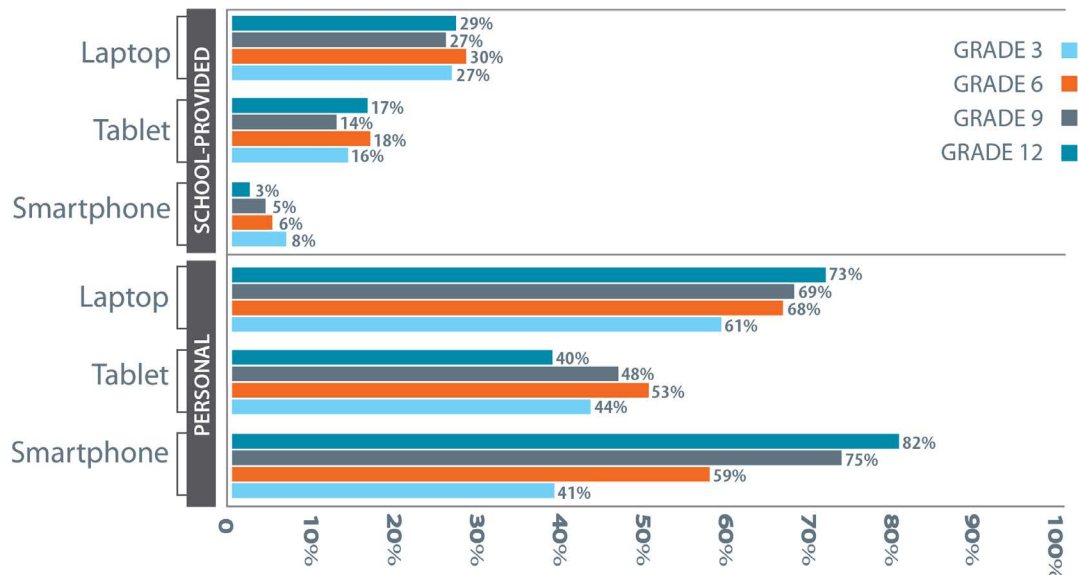
Gaming equals learning. It’s the learning, suggests veteran game designer Raph Koster, is what our favorite games are all about—and we can learn a lot from them about improving education outcomes. Well-constructed and applied, learning games and game-based strategies hold the potential to boost motivation, extend persistence, build automaticity, and deepen learning.³⁹

TREND #8: THE MOBILE WORLD IS WHERE LEARNERS LIVE NOW

More than 13 years ago, Marc Prensky asserted, “Our students have changed radically. Today’s students are no longer the people our educational system was designed to teach.”⁴⁰ He got it right. His description of the way children use devices and technology, and the profound effect on the ways in which children will learn based on being “digital natives” were prescient. Today, children are more engaged in learning when using the latest technology, because it’s what they’re most used to interacting with to gain knowledge, communicate, and play—24/7.

Mobile use starts early. National research conducted by Project Tomorrow and documented in “From Chalkboards to Tablets: The Emergence of the K–12 Digital Learner”⁴¹ shows that in 2013, even very young students have access to the Internet via mobile devices. The same study shows the deep preference students have for working in more personalized and fluid learning environments to gain knowledge, and to interact with teachers and their peers.

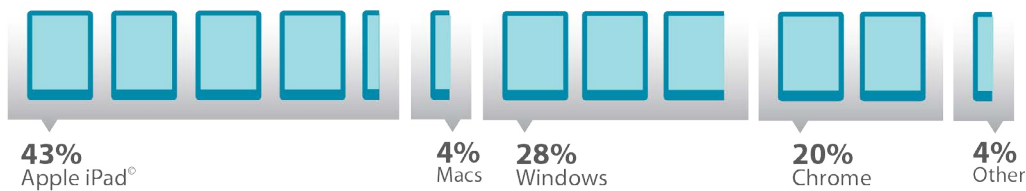
Kids going mobile



Adapted from Project Tomorrow 2013.⁴²

Staying in sync is essential. Ed-tech makes learning more personal and sharable, and that’s a good thing. At the same time, the high-speed nature of today’s digital environment means that what’s “cool” today in both devices and apps can be “old-school” tomorrow—and educators need to remain aware of those changes. For example, predictions are that we are heading for a post-texting world.⁴³ With the rise of Internet-capable smartphones, chat apps for instant messaging that bypass carrier charges are gaining ground, particularly with younger users. They have the advantage of allowing for communication and collaboration in real time, communications are less subject to hacking, and they offer a richer messaging interface than SMS at a cost-effective price.

Apple and Google dominate the education device market



Adapted from FutureSource Consulting/Wall Street Journal⁴⁴

The tablet wars aren’t over. While there are many tablet alternatives available, the two top contenders are Apple’s iPad™ and Google’s Chromebook™. “The iPad is a powerful pedagogical tool, but we are seeing the market take its course. Other companies are now providing competitive alternatives at lower price points,” says Brian Lewis, CEO of the International Society for Technology in Education.⁴⁵

The iPad was a hot commodity in schools and districts in 2013, and that trend is sure to continue. By the end of 2014, the Los Angeles Unified School District (LAUSD) plans to put an iPad in the hands of every student—that’s 640,000 Apple tablets.⁴⁶

The LAUSD’s massive purchase and move to digital learning was encouraged in part by findings from the U.S. Department of Education report, “Evaluation of Evidence-Based Practices in Online Learning: A Meta-Analysis and Review of Online Learning Studies.”⁴⁷ Among the key findings in the report are that students who took all or part of a class online performed better, on average, than those taking the same course through traditional face-to-face instruction, and that instruction combining online and face-to-face elements had a larger advantage relative to purely face-to-face instruction than did purely online instruction.

Chromebook, the affordable alternative to Windows-based laptops, saw its share of the K–12 market skyrocket from just one percent in 2012 to 20 percent by the third quarter of 2013. Easy set-up, low maintenance requirements, and low price (some models are under \$200) make it attractive to schools that want to start 1:1 computing on a budget. In addition to price advantages, Google is providing a boost by offering its word-processing, spreadsheet, and other software free to schools.⁴⁸

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As noted in the Blended Learning Implementation Guide (BLIG), Hobson was referring to the fact that, despite policies to the contrary, students aren't likely to separate themselves from their devices. "We ask them to power down and pretend not to notice that they don't. Every school is a BYOT school, but only a few acknowledge and leverage the fact."

The number of apps and software packages is booming. There are no accurate numbers for the educational app and software markets, because avalanches of new entries that are free or for-purchase are entering the marketplace daily. But an indicator can be seen with iPad apps: out of over 700,000 apps⁴⁹ developed just for the iPad, over 65,000 of them are considered educational.⁵⁰

Upcoming assessment tests are driving device adoption. In addition to the personalization benefits of 1:1 computing, U.S. standardized tests may also explain some device purchase activity. Beginning in the 2015 school year, K–12 students in states that have adopted the CCSS will take their tests on computers, as administered by the Smarter Balanced Assessment Consortium and the Partnership for Assessment of Readiness for College and Careers (PARCC).

TREND #9: BYOD IS HERE AND KEY TO ACTIVE THREE-SCREEN DAYS

"You're already BYOT [Bring Your Own Technology] but you won't admit it," Jill Hobson told a group of superintendents in 2011.⁵¹ Hobson is the Director of Instructional Technology of Forsyth County Schools. A few years ago, Hobson and a group of Forsyth teachers piloted a Bring Your Own Device program (BYOD is used here synonymously with BYOT) and convinced the school board to update their Acceptable Use Policy to allow students to bring their own laptops, phones, and tablets to school—and put them to use.



Watch the video.⁵²

De facto BYOD. As noted in the Blended Learning Implementation Guide (BLIG), Hobson was referring to the fact that, despite policies to the contrary, students aren't likely to separate themselves from their devices. "We ask them to power down and pretend not to notice that they don't. Every school is a BYOT school, but only a few acknowledge and leverage the fact."

On the rise. A survey last year of IT professionals in higher education and K–12 districts in the United States and the United Kingdom found that only six percent of respondents reported that their institution had no BYOD policy and no plans to implement one. The survey does indicate that higher education is outpacing K–12 in the use of student-owned

devices, with 89 percent of respondents from colleges and universities reporting they allowed students to use their own devices, and only 44 percent of K–12 participants reporting the same, but the trend is growing.⁵³ Increasingly tight district budgets are one of the reasons for a 47 percent growth in BYOD programs, according to the latest Project Tomorrow report.⁵⁴

Extra, but not equity. Allowing students to bring their own devices to school will improve student access, but it won't close the digital divide without a good plan. The best solution is for schools to provide every student with a take-home device—a production device with keyboard for secondary students. That costs less than \$250 per student per year and can be phased in over a couple years along with gradual budget reallocations.⁵⁵

If a school can't afford to give every student a device, the BLIG suggests that "BYOD should be combined with school-provided devices available for checkout and take-home use (with a parent-signed acceptable use form)."⁵⁶ Schools should purchase at least enough devices to support state online assessment on a reasonable schedule and to support the baseline instructional needs of the school. To reduce the stigma associated with a school-provided device, schools should promote periods of group work and peer-to-peer learning.

The three-screen day. Most of us learn and work on two or three different screens—students should have the same opportunity to use the right device for the right job and at the right time. Sometimes a mobile consumption device is just right, and sometimes a keyboard and a 13-inch screen is the best tool for writing and editing. It's also nice to have a phone and a tablet or laptop for conducting interviews, and sometimes a big screen for sharing or creating is a must. Each serves its purpose.

Three screens can be a great way to learn, but few schools can provide that many. BYOD should be used to create a high-access environment—a three-screen day that includes a mobile device, a production device, and a large sharing/editing screen (e.g., an interactive whiteboard).

Policy guidance. For educators who are thinking about adopting BYOD and/or revising Internet policies and need a place to start planning policy, see the [Consortium for School Networking \(COSN\)](#)⁵⁷ report, "[Rethinking Acceptable Use Policies to Enable Digital Learning: A Guide for School Districts](#)" (revised in 2013).⁵⁸

TREND #10: MORE BROADBAND, PLEASE!

"When schools and teachers have access to reliable Internet connections, students can discover new skills and ideas beyond the classroom," said Mark Zuckerberg, Facebook founder and CEO. "The future of our economy and society depend largely on the next generation using and building new online tools and services, and I'm glad to support [EducationSuperHighway's](#) work."⁵⁹ EducationSuperHighway is a non-profit working to ensure that every K–12 public school in America has the Internet infrastructure that students and teachers need for digital learning.

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The need for speed. There are multiple private and government agencies working to solve the school broadband shortfall. Access to high-speed broadband, according to [State Educational Technology Directors Association \(SETDA\)](#), is as vital a component of elementary school infrastructure as electricity, air conditioning, and heating. According to a SETDA report, to fully leverage and implement blended learning, the minimum Internet access speed at every school in the United States should be 100 megabits per second for every 1,000 students and staff members.⁶⁰ [The Broadband Imperative: Recommendations to Address](#)

[K–12 Education Infrastructure Needs](#) thoroughly covers the urgent need to upgrade service and speed connections.⁶¹

Failing the national test. EducationSuperHighway’s National [School Speed Test](#) has showed that so far (at the end of 2013), 72 percent of America’s public schools lack the broadband they need for digital learning to support students—approximately 40 million students.⁶²



Watch the EducationSuperHighway video.⁶³

Philanthropic advocates. To support digital literacy, the U.S. government has a national broadband plan for education, but there is also a movement by philanthropists to supply much needed funding and speed the process. Over the next two years, Zuckerberg has pledged to give \$3 million and The Bill and Melinda Gates Foundation has promised to give \$2 million to EducationSuperHighway.

Case Studies: Blended Learning Innovations in Elementary Math Classrooms

The case studies that follow show in a powerful way that it is the skills, talents, and willingness to explore new ways of teaching and learning that will bring us collectively to higher levels of achievement with state and national learning standards.

mSchools

INNOVATIVE MATH REMEDIATION: 6 MONTHS OF LEARNING PROGRESS IN 6 WEEKS⁶⁴

Founded by Elliot Sanchez and based in New Orleans, mSchool is a revolutionary concept in charter education. Forbes named Sanchez a 30 Under 30 Education honoree, and Sanchez's mSchools have earned many honors, including Teach for America's 2013 Social Innovation Award. The mSchool mission is to help community centers open accredited, state-funded classrooms that primarily use adaptive personalization learning software.

The group takes over existing school and community-based afterschool programs and turns them into math remediation platforms that leverage blended learning to help struggling students. Ninety-eight percent of the population that mSchool locations serve is underprivileged, and the average student can be as much as three years behind in their math ability. So far, 14 mSchools have been opened in Louisiana, with pilots scheduled in early 2014 for Pennsylvania, New Mexico, and Florida, and 20 more locations are pending, including sites in South Africa, Australia, and Canada.

Sanchez is a former math teacher who served as a cabinet-level consultant to two Louisiana state superintendents. Through his classroom, district, and state-level experience in education, Sanchez knew that the only way to help students in the short period provided by afterschool programs was through the unprecedented differentiation techniques provided by blended learning. "From what I saw, adaptive software makes a huge impact in learner progress," said Sanchez.

Personalized learning in every classroom. For students who have experienced very little success in math, engagement is a big priority. Considering the start-up nature of the initiative, mSchools also requires quite a lot of data in order to inform the stakeholders in the program. Finally, flexibility is a big plus; an mSchool location needs to be able to be set up in any available room at a school or community center. For mSchools and Sanchez, DreamBox ticked all of those boxes and more. "DreamBox is one of our best tools. It forms the backbone of our curriculum for elementary and middle school students," reports Sanchez.

Student-driven learning with minimal adult support. The mSchool model demands flexibility. Within a month, an existing afterschool program can be turned into a blended learning lab in either a school or other location, such as a community center. There can be

as many as 25 students in a classroom, with up to three teachers or volunteers present to facilitate the learning, act as guides to help students navigate the program, and provide the program's social and study skills curriculum. For the most part, math instruction is almost entirely student-driven through their connected device and the DreamBox Learning system. But for the students to drive that education, they must be engaged.

An mSchool location is open four days per week, with students spending between 60 and 90 minutes on the system each day. At school-based locations, attendance is mandatory for students who have been identified as profoundly struggling (as much as four years behind in their skills). For example, most mSchool students are in Grades 8 through 10, but the content prescribed by the DreamBox system for student differentiation is typically for Grades 4 through 8.

Engagement and rewards lead to student success. In only two full years of operation, the growth and success of the mSchools initiative is nothing short of impressive.

First, the program has grown from one pilot location in a community center for the 2012–2013 school year to more than 24 locations throughout New Orleans in 2013. An expansion into the Philadelphia area is currently in the planning stages.

This growth is possible because the mSchools formula—with the help of DreamBox and the deep personalization it delivers—is working. In the community center pilot, DreamBox data showed that students mastered six months' worth of curriculum in just six weeks. When working under the compressed schedule of an afterschool program, time is precious.

In a longitudinal study last year that compared state data from students who participated in an mSchools classroom to their counterparts in school that did not participate, the

mSchools students made gains equivalent to 2.9 years of learning compared to what their cohorts learned in the full school year!

The future holds even more aggressive growth for mSchools, including the possibility of 20 other cities and international locations.

“DreamBox does a fantastic job of balancing kids' comfort level, engagement, and success within their zone of proximal development,” says Sanchez. “They are a key partner in our future goals and strategies.”



Summer Advantage Schools

A NEW APPROACH TO SUMMER LEARNING LOSS: 4.1 MONTHS OF MATH ACHIEVEMENT IN JUST 4 WEEKS⁶⁵

Earl Martin Phalen is Founder and CEO of [Summer Advantage USA](#), a non-profit organization dedicated to solving the summer learning loss problem that affects many children living in poverty. [Jessie Woolley-Wilson](#) and other education visionaries like her, Phalen believes that all kids—regardless of their zip code—can and should get the education they deserve to fulfill their potential. His vision is now a reality, and its reach has been growing rapidly since Summer Advantage began in 2009.

Summer learning-loss is real. Students in the countries outpacing the U.S. in academic success attend school for 30–45 days more per year than U.S. students. A 2011 Wallace Foundation/Rand Education study stated, “research indicates that, on average, students lose skills over the summer, particularly in mathematics. However, not all students experience ‘average’ losses, and summer learning loss disproportionately affects low-income students. This is particularly true in low-income communities where students face the steepest declines in learning over the summer months.”⁶⁶

There is an answer. Summer Advantage Strategic Initiatives head Michelle Ciccone states, “Students in low-income situations tend to lose three months’ worth of math learning over the summer. Earl knew he would have a greater impact on learning if he focused on summer programs rather than after school programs.” The [National Summer Learning Association](#) says that quality summer programs can make a five-month difference annually in learning achievement.⁶⁷

Summer Advantage serves children who need it most. After just five years, Summer Advantage programs serve 3,000 disadvantaged students from kindergarten through eighth grade, at 24 sites in four states—in urban, rural, and suburban communities. Children invited into the program are struggling, and usually have learning gaps to fill. The cost-efficient programs typically operate 6.5 hours per day, five days per week, usually for five weeks, with programs varying in length across different communities. Research-based, culturally-sensitive curricula are aligned with state and national learning standards.



Successful blended learning requires effective technology. Summer Advantage is built around the blended learning model. With no time for training or professional development on new technology during the four to five week summer program, Summer Advantage leadership looked for an online learning system that was user-friendly and easy to navigate for both teachers and students from day one, and that had a track record of closing the achievement gap in challenging situations. DreamBox met all the requirements Summer Advantage was looking for—and more.

The main goal of Summer Advantage is to reinforce what a child learned in the previous school year. By design, students who are struggling with the previous year's content are invited to the program. "DreamBox increases the number of concepts a student is exposed to and helps to fill any gaps in understanding, regardless of their ability level," Ciccone emphasizes.

Summer Advantage maximizes one-on-one and small group learning time with a rotational blended learning model. The classes are broken into thirds during math time, with one-third working on DreamBox, while the remaining two-thirds work with a teacher and an assistant.

The program's student-to-teacher ratio is kept low to increase the individual attention students receive. Teachers use DreamBox data to form smaller groups in support of the rotational model, allowing for easier differentiation.

Closing gaps and achieving net gains in just four weeks. "The amazing thing about using DreamBox in our Summer Advantage USA program was that it allowed us to—in some cases—more than double the skills and content each child was able to practice and master. In just 4 weeks of using DreamBox for 20 minutes 4 times a week, as part of the math instructional block, we saw a full 4.1 months of improvement in math achievement," Ciccone reports. That means a net gain of more than seven months' worth of math learning for students who would have lost three months—surpassing the National Summer Learning Association statistics.

Section Elementary School

A NEW DIRECTION: FILLING ACHIEVEMENT GAPS AND ENRICHMENT NEEDS⁶⁸

One of the nation's highest-ranking elementary schools is using the recently released DreamBox Math for iPad app in their Innovative Personalized Learning Communities (IPLCs) to drive student achievement. Section Elementary School, in Mukwonago, Wisconsin is a nationally recognized Blue Ribbon School, ranked among the state's highest performing schools. This year, 304 schools achieved this status out of more than 132,000 public and private schools in the nation.

Supports core math curriculum. Section Elementary has recently instituted an innovative new program called IPLCs where students become passionate and empowered learners equipped for the 21st century world. Inspired by a team of teachers, the IPLC revolves around 21st century tools for learning and assessing, driven by the Common Core State Standards in an open community setting. Each flexible learning community includes students of different ages learning at their own personal pace, working independently, one-to-one, in

small peer or teacher led groups, and in whole-group settings to advance their learning based on each student's personal capabilities and accomplishments.

The communities rely heavily on 21st century technology as learning tools to track learning progress and to communicate with other learners. With 75 tablets and 75 Chromebooks shared across IPLCs, teachers are using technology to drive flexible groupings and provide data for real-time assessment.

The DreamBox Math for iPad app is being used by 72 lower elementary students in two adjacent classrooms (known as the Community Room) and a break-out area. Led by three teachers, this innovative blended learning community of first through third grade students is using technology during their daily math instructional time. "When we were looking for software to use in our IPLC classrooms," comments Principal Robert J. Slane, "in addition to being intelligent and adaptive, it was very important to us that the personalized math program we selected be user friendly, simple to access and easy to navigate." To support the core math curriculum at Section Elementary, the selected software also had to have a rigorous curriculum that was engaging and fun for the students to use. That was a large order to fill, but Slane gives high marks when he says, "DreamBox on the iPad provided it all!"

Filling both achievement gaps and enrichment needs. The Section Elementary IPLC is helping to fill achievement gaps for students who need additional help, and math enrichment for those who need a challenge. "My students love playing DreamBox on the iPad," says IPLC 123 teacher Jodie Kujawa. "It's so engaging that they ask to use it all the time—even outside of math time. However, they are often so busy playing that they are not aware that they are actually engaging with a highly rigorous math curriculum."

Measuring progress simplified. DreamBox on iPads, and iPad Minis®, is being used with the younger students in the IPLC program as a great way to engage students. It also provides teachers with an easy-to-use tool to measure progress with up-to-the-minute reporting. IPLC 123 teacher Jennifer Sitzberger raves, "I love the teacher reports in DreamBox. The Common Core Standards and Strands report matches our continuums." With just 20 minutes dedicated per day per child on DreamBox, students have the opportunity to learn, and teachers have actionable, current information to provide guidance exactly when it's needed. "The report," says Sitzberger, "allows me to see exactly where each of my students is proficient and how they are progressing."

About Getting Smart

[Getting Smart®](#) is an education advocacy firm passionate about innovations in learning. We help education organizations construct cohesive and forward-thinking strategies for branding, awareness, advancement and communication, and public and media relations. We are advocates for better K–12 education as well as early, post-secondary, and informal learning opportunities for all students. We attempt to accelerate and improve the shift to digital learning. On [GettingSmart.com](#) we cover important events, trends, products, books, and reports.

Disclosure

DreamBox is a Getting Smart Advocacy Partner

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Bellevue, Washington, and launched its first online learning product in January 2009. DreamBox Learning Math has won more than 35 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 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. DreamBox supports teachers and their practice in every type of learning environment, offline or online. For more information about DreamBox Learning Math and the DreamBox Math for iPad app, please visit: dreambox.com.

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