Introduction: The road to math success

The journey to mathematics proficiency can be a challenge for many learners. The Educational Testing Service’s 2015 global report, *America’s Skills Challenge: Millennials and the Future*, found that the 16- to 24-year-olds who will be part of the U.S. labor force for the next 50 years ranked last in numeracy against their peers in 22 other countries. These rankings weren’t just a question of economic disadvantage; in the same study, even U.S. millennials with graduate degrees scored near the bottom in numeracy.

Gaps can be closed using digital tools. *Blended Learning*, which combines the best of face-to-face instruction with a personalized learning experience powered by digital tools and technology, shows promise in closing this achievement gap. However, as Michael Fullan notes in *Stratosphere*, technology alone won’t spark significant student gains: “Making digital devices available and helping teachers and students use them is the easy part—but it isn’t pedagogy.” The best Blended Learning initiatives, like those of Baltimore County Public Schools’ *STAT* Program, increase engagement, provide instant feedback, and create multiple opportunities for learning and peer interaction—for deeper math understanding and higher achievement.

There is great interest in creating digital learning opportunities for math students. It stems from the historical challenge to engage students in a deeper conceptual understanding of math content, as well as the capability to digitally represent ideas and concepts. In addition, digital programs that are adaptive allow students to work on a customized path that narrows gaps while also pushing the individual student to new levels of understanding.
Throughout this guidebook, we’ll cover ways to plan, implement, measure, and adjust your own Blended Learning roadmap to student success. You’ll also find tips for administrators and coaches to empower teachers on their own Blended Learning journeys—and a reminder to celebrate the successes you achieve along the way!

At the 2014 iNACOL Blended and Online Learning Symposium, we asked educators and thought leaders what most excited them about Blended Learning and were thrilled by their responses.

Rebecca Middle @rebeccamiddle - Nov 5
Excited to learn the varied ways educators use data for personalized learning with this model. #blendedjourney

Dan Froelich @danfroelich - Mar 25
My blendedjourney began in 2008 when teachers expressed a need to respect time and current mastery to create a new PD model.

Mrs. Vanderbome @MrsVanderbome
@danfroelich I think it's a great model for PD. Why not Differentiate PD just like we Differentiate learning. #blendedlearning
The Blended Learning math roadmap

Effective Blended Learning frameworks are those in which the school community is engaged to: 1) **plan** by defining desired outcomes and creating goals; 2) **implement** programming; 3) **measure** impact, share best practices and make commitments; 4) **adjust** via a continuous improvement cycle; and 5) **celebrate** successes.

1: **PLAN** for student success

The first step in designing your Blended Learning roadmap is to define your instructional vision. Consider which Blended Learning model best supports that vision as well as your mathematics program and learning philosophy, and how it will support or challenge current practice in your school, classroom, or district.

**ENGAGE YOUR STAKEHOLDERS.** Invite the community, parents, educators, and students to participate early and often in decision-making, so they feel part of the process and can articulate the purpose, plan, and desired outcomes of your Blended Learning initiative. Ensure they are engaged and feel accountable for its success. Not everyone needs to agree, but providing an outlet for feedback and giving all stakeholders an opportunity to be heard will go a long way toward getting buy-in. Maintain momentum by communicating decisions early and often.

**ALIGN DIGITAL TOOLS TO INSTRUCTIONAL VISION AND GOALS.** Evaluate digital curricula, delivery platforms, and devices within the context of your vision, and choose the Blended Learning model that best supports the outcomes you desire. No matter which curricula and tools you select, the focus must always remain on learner outcomes.

**SELECT THE APPROPRIATE MODEL.** To achieve exemplary results from any Blended Learning program, there must be a solid understanding of the various Blended Learning models. The model you choose should align to your instructional vision. It’s equally important not to overlook continuous learning opportunities for professional development and the adoption of content that supports your model, instructional vision, and existing curriculum.

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**Blended Learning Models**

- **Brick-And-Mortar**
- **Online Learning**
- **Blended Learning**
  - Rotation model
  - Flex model
  - À la Carte model
  - Enriched Virtual model

Source: Clayton Christensen Institute for Disruptive Innovation
Blended Learning programs can be thought of as arrayed along a continuum. In early implementations, digital content is used to supplement a more traditional curriculum. At the next step on the continuum, an intermediate model can be implemented to differentiate core curriculum using data from digital content. For example, intervention programs are a data-informed blend. They’re often implemented with an additional math experience (i.e., double block) driven by identified gaps. The most advanced Blended Learning implementation provides core instruction, which is modular and personalized. The scheduling is dynamic, instruction is adaptive and personalized, and student progress is competency-based; determined by mastery—not by seat time. Are you looking for additional guidance around selecting digital curricula? Read *10 Steps to Choosing Digital Curricula for Blended Learning.*

**Blended Learning Metrics Chart**

The goal is to drive to a fully integrated, mastery-based implementation.

<table>
<thead>
<tr>
<th>Core</th>
<th>Supplemental Blend</th>
<th>Data-Informed Blend</th>
<th>Integrated, Mastery-based</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Traditional basal; whole group cycles of concept-practice-assess</td>
<td>Combination of traditional and blended intervention</td>
<td>Modular, personalized learning progressions</td>
</tr>
<tr>
<td>Tech</td>
<td>Limited access; lab rotation or occasional class rotation</td>
<td>Partial use</td>
<td>Fully integrated</td>
</tr>
<tr>
<td>Adaptive</td>
<td>Occasional use as supplement; provides some personalized learning</td>
<td>Regular use informs grouping and intervention instruction</td>
<td>Fully integrated (3–5 times/week), complemented by performance assessment</td>
</tr>
<tr>
<td>Progress</td>
<td>Grade-level cohort, occasional retention</td>
<td>Blocked intervention</td>
<td>Individual mastery-based</td>
</tr>
<tr>
<td>Data</td>
<td>Limited use of adaptive assessment data in core instruction</td>
<td>Some use of data to form performance groups</td>
<td>Multiple sources of formative data inform individual learning progressions</td>
</tr>
<tr>
<td>Engagement</td>
<td>Students passively listen to the teacher with spurts of high engagement</td>
<td>Mixture of high and low engagement instruction</td>
<td>Vast majority engage in cognitive work and persist through challenges</td>
</tr>
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BUILD A COMMUNICATION FRAMEWORK. Ensure that every stakeholder can effectively evaluate the learning needs for student success by employing the gold standard: immediate feedback. There are many benefits of in-the-moment information from which students understand digital feedback and are able to communicate what they are doing well with, and where they’re struggling. A useful modality is an immersive, adaptive digital environment that allows students to learn fact fluency, models, and strategies that they can apply and transfer in more complex situations. The ability to customize and provide instant feedback creates a personalized, extra-effective math learning experience. When feedback is available to teachers via data and actionable dashboards, the results can be powerful, because meaningful feedback helps “make learning visible.”

CREATE A PLAN TO MANAGE CLASSROOM TECHNOLOGY. A well-considered strategy and plan for managing technology in the classroom helps to ensure a smoothly running program—keeping the focus on learning, rather than troubleshooting tech glitches. While having an internal IT department or outsourced Support Manager is ideal, there are many ways to handle IT issues that don’t necessarily involve additional financial investment. Consider a student help desk or using parent volunteers. An essential asset is a tip sheet that answers basic questions, such as how to connect printers, access the Internet, or use a wiki. For more ideas, The Learning Accelerator has a wealth of resources for Blended Learning programs, including a Blended Learning Implementation Guide with guidance and links to more practical resources on IT management.

HELP STUDENTS UNDERSTAND WHY THEY’RE USING TECHNOLOGY. Provide context for learners so they understand the purpose of ed-tech in their learning day. Create and share a plan linking student accountability to learning goals. Students should build connections between digital content, the core curriculum, and the world around them. Set expectations for technology use and how digital content and tools will be incorporated into learning plans.

Watch the Google Hangout: “Adaptive Technology and Data in the Classroom”

“There has been a disparity between the way kids learn and the way they live ... being able to leverage technology in a way that is really instructionally sound and supports both the acquisition of knowledge and the application of knowledge is a wonderful thing.”

—Jason Bedford, Senior Vice President, Client Engagement and Success at DreamBox Learning
DEFINE ONGOING PROFESSIONAL DEVELOPMENT. As Blended Learning becomes the new normal, students will become empowered when they are at the center of their learning experience. That means that educators will need to transition their practice to one that looks more like a learning facilitator or coach. Creating professional development for teachers that mirrors the Blended Learning journey of students will provide a more meaningful model for educator growth than the traditional “one and done” workshops of the past.

Take a look at the TPACK Model below, which combines content knowledge, technology, and pedagogy to provide educators with a comprehensive growth plan that is personalized to each individual as it highlights the teaching practices expected in the classroom.

ADOPT A CONTINUOUS IMPROVEMENT MODEL. Continuous Improvement has been a standard in the business world for many years, particularly in lean manufacturing and lean programming environments. It’s an approach that systematically seeks to achieve small, incremental changes in processes to improve efficiency and quality, with every person holding responsibility for forward progress. Its effectiveness has brought about growing adoption in education. Great results rely heavily on data collection and analysis to generate evidence-based improvements in classrooms, schools, and districts. For help and ideas around creating your own plan, the Carnegie Foundation for the Advancement of Teaching’s, Continuous Improvement in Education provides research, models, user-friendly examples, and references to help you design a plan that will work for you.
2: IMPLEMENT for student success

Throughout the implementation stage, ensure that all conversations, trainings, and events refer back to goals for teaching and learning, and get specific about how implementation efforts will address every stakeholder’s needs (including students and parents).

Document implementation roles and expectations for every stakeholder and ensure that support is available at all stages of the process for everyone. Most importantly, your initiative will need commitment from teachers and a plan to support them. This section highlights strategies to help teachers flourish in Blended Learning environments.

EMPOWER TEACHERS TO INNOVATE AND DEEPEN THE LEARNING EXPERIENCE. Heather Staker, co-author of Blended: Using Disruptive Innovation to Improve Schools, describes the teachers of today: “Educators are becoming entrepreneurial designers and they’re finding ways to reconfigure their schedules, budgets, and staffing to piece together the learning experience in ways that are truly student centered—ways that are personalized and allow students to move on as soon as they demonstrate mastery. It’s a fun and momentous time to be seeing these changes in education and see the teacher leaders who are bringing them about.”
Characteristics of the Blended Learning Teacher

iNACOL and The Learning Accelerator (TLA) assembled a national committee of blended learning practitioners, thought-leaders, and experts to explore one critical question: What are the key characteristics of teachers in successful blended learning environments?

1 | MINDSETS
A New Vision for Teaching and Learning
Orientation Toward Change and Improvement

2 | QUALITIES
Grit
Transparency
Collaboration

3 | ADAPTIVE SKILLS
Reflection
Continuous Improvement and Innovation
Communication

4 | TECHNICAL SKILLS
Data Practices
Instructional Strategies
Management of Blended Learning Experiences
Instructional Tools

To learn more, visit: inacol.org

Watch the video: “Blending Better: Teaching Competencies for the Blended Learning Educator”

“As learning changes for students, the support given to teachers must also evolve ... Blended Learning for teachers is the solution.”
—Thera Pearce, Director of PD and Implementation at DreamBox Learning
Innovation means taking a fresh approach to professional development, too. In addition to the characteristics and competencies described in the iNACOL Blended Learning Teacher Competency Framework (on the previous page), the DreamBox Learning approach to professional development suggests that educators:

» **EMBRACE STUDENT-DRIVEN LEARNING.** When the student is placed in the driver’s seat, it means that teaching practice becomes increasingly dynamic and is guided by constant self-reflection and improvement. When a model is embraced that fosters student ownership of learning, innovative, adaptive tools are important resources for individualized learning.

» **DIFFERENTIATE INSTRUCTION WITH DATA.** A digital curriculum that is adaptive and collects micro-data about what students are learning and how they are progressing gives educators greater insight, and provides actionable data that can efficiently identify learning gaps and provide appropriate support. That way, when a student is ready for more challenging work, they can move ahead.

» **BLEND LEARNING FOR TEACHER DEVELOPMENT.** As learning environments change for students, there are also opportunities to rethink the types of support given to teachers. The question becomes how to provide ongoing, relevant, job-embedded, and engaging professional development in a way that recognizes limited budgets, while providing teachers with practice in environments that reflect their classrooms. The solution is Blended Learning for teachers—personalized professional development that provides educators with what they need, when they need it.9

» **BUILD PERSONALIZED, COMPETENCY-BASED LEARNING EXPERIENCES FOR TEACHERS.** Educators benefit from a personalized professional development pathway that is customized and competency-based. Engaging and relevant materials should be easy to access through a platform that supports teacher learning by connecting content from the course with the pedagogical approaches of the classroom. Blended technology and pedagogy are the future of professional development. With the new tools and data that are currently available, personalized educator learning can be realized—at very low cost to schools and districts.
3: MEASURE for student success

When school communities embrace a growth mindset culture, both teachers and students are encouraged to take risks and learn from mistakes. There is an effort to reflect on what works internally, while externally a cycle of improvement informs plans for the next phase of development. You have to model ongoing evaluation and adjust at every stage, from year to year. Resources, curricula, and goals may shift as you analyze data and results. The path of a blended journey is flexible and adaptive in respect to these changes. What are some considerations for the definition of success?

**STUDENT PROGRESS IS BASED ON CONTENT MASTERY.**
Student technology use is closely linked to learning goals. Teachers set specific objectives for each digital curriculum being used by students. Students are engaged in personalized learning, and progress is guided by the content mastered. They build connections between digital content, the core curriculum, and the world around them.

**DATA IS USED TO ENHANCE PARENT COMMUNICATION.**
Student progression and competency guide communication with parents and guardians. Because information is based on evidence, teachers can engage in more meaningful, productive conversation, and make it easier for parents to know and understand how their students are doing, and how best to support them.

**TEACHERS LEARN FROM EACH OTHER.** Professional development practices should model the desired changes in the classroom. Provide the opportunity for teachers to learn from each other and discuss successes and challenges. Educator support is customized to provide a variety of learning options, and there is flexibility in time, pace, and place.

Watch the Google Hangout: “Talking Blended Learning with Math Coach, Rebecca Murry”

“A Blended Learning environment can also be an avenue for gathering diagnostic information—that is new. This data ensures that students receive the right level of support, and also supports the development of effective student clusters for small-group instruction. In addition to driving instruction, data can be used to enhance parent conversations.”

—Rebecca Murry, Math Coach at the Manhattan and Queens campuses of the United Nations International School
4: ADJUST for student success

Continuous improvement in your learning and teaching community is a commitment to be adaptive.

DRIVE IMPROVEMENT WITH ACTIONABLE DATA. When data is easily accessible and actionable, the school year can kick off efficiently, allowing teachers to optimize learning for all students. It should continue on a daily basis, with ongoing action based on evidence of learning or struggle. Just as adaptive learning environments respond to student actions to inform the next lesson, teachers can use data to identify which students already understand math concepts and content, which students are in the process of learning, and which students have not accessed or demonstrated understanding of content. The simple process of identifying those students assists teachers to more efficiently plan for and adjust their instruction in real time.

FINE TUNE YOUR CONTINUOUS IMPROVEMENT PROCESS. Commenting on his own book, *The Six Secrets of Change*, in an *EdWeek* commentary, Michael Fullan wrote, "Learning is not workshops, courses, and strategic retreats. It is not school improvement plans or individual leadership development. These are inputs. Rather, learning is developing the organization, day after day, within the culture." The goal is to build an environment where the expectation is one of continuous learning and ownership is fueled by continuous feedback from all stakeholders—modeling the growth mindset we desire in students!

KEEP STAKEHOLDERS ENGAGED AND INFORMED. Keep lines of communication open for everyone, including parents, as teachers reevaluate data regularly to inform valuable, continuous feedback and ensure all decisions surrounding your Blended Learning initiative positively impacts students.

5: CELEBRATE along the way

Celebrate student success when learning goals have been achieved. It’s also important for teachers to be recognized—to propel motivation and progress.

TAKE TIME TO SHARE IDEAS AND ACCOMPLISHMENTS. Recognizing and applauding a colleague’s success is all part of supporting a growth mindset and a culture of deep collaboration. Think about creating a wiki forum a Professional Learning Community, or take advantage of existing sites like Edmodo and Teach Meet. There are many ways to approach it, but the goal is to celebrate as a community. It is critical that teachers have a forum to share, celebrate, and as a result, continue on their own learning journeys.
The shift to new ways of teaching and learning

The shift to Blended Learning is driven by the opportunity to create a truly adaptive experience that challenges, encourages, and engages students in an individual way. Adaptive learning is a disruptive innovation—it combines ongoing, formative assessments with targeted instruction to deliver engaging, personalized learning. Blended Learning may initially be used to supplement traditional instruction, but in a growing number of cases, it is being fully incorporated into a core instructional program that is increasingly student-driven and competency-based.

The work of transforming education is difficult, yet rewarding. It’s about being flexible and adaptive as we work toward identified goals. With continuous improvement as part of the Blended Learning model, we can advance teaching, deepen learning, and increase the momentum of educators and students who are working to realize their full potential.

Partner with DreamBox Learning to realize the benefits of Blended Learning. At DreamBox Learning, we empower students to think mathematically and independently as they activate prior knowledge to solve problems. We achieve this goal by engaging students in meaningful contexts and situations, requiring them to directly model and represent their own solution strategies, successfully work with both concrete and abstract models, and receive specific feedback, hints, and lesson recommendations that are differentiated for each student.

We’re also committed to providing rich online resources and a Blended Learning approach to professional development that moves teachers farther and faster in their math teaching practice.
SIGNPOSTS to help you stay on track

Ensure that your Blended Learning roadmap stays on course by checking your digital curriculum implementation against these success characteristics.

1: PLAN

» Engage Stakeholders
» Align Digital Tools to Instructional Vision and Goals
» Select Appropriate Blended Learning Model
» Build a Communication Framework
» Create a Plan to Manage Classroom Technology
» Help Students Understand Why They’re Using Technology
» Define Ongoing Professional Development
» Adopt a Continuous Improvement Model

2: IMPLEMENT

» Empower Teachers to Innovate and Deepen the Learning Experience
» Embrace Student-Driven Learning
» Differentiate Instruction with Data
» Blend Learning for Teacher Development
» Build Personalized Competency-Based Learning Experiences for Teachers

3: MEASURE

» Student Progress is Based on Mastery
» Data is Used to Enhance Parent Communication
» Teachers Learn from Each Other

4: ADJUST

» Drive Improvement with Actionable Data
» Fine Tune Your Continuous Improvement Process
» Keep Stakeholders Engaged and Informed

5: CELEBRATE

» Take Time to Share Ideas and Accomplishments
REFERENCES


3. Ibid., page 221.


DreamBox Learning, Inc. was founded in Bellevue, Washington, and launched its first online learning product in January 2009. DreamBox Learning® Math has won more than 42 top education and technology industry awards and is in use in all 50 U.S. states and throughout Canada. The DreamBox® platform offers a groundbreaking combination of Intelligent Adaptive Learning technology, a rigorous K–8 mathematics curriculum, and a highly motivating learning environment. DreamBox in English and Spanish 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 the student’s unique needs. DreamBox supports teachers and their practice in every type of learning environment. For more information about DreamBox Learning Math and the DreamBox Math for iPad® app, please visit DreamBox.com.