BETTER BLENDS WITH VISUAL GAME-BASED MATH

NIGEL NISBET
DANA LUTHER

With Contributions from
Getting Smart/Tom Vander Ark

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MIND Research Institute
A neuroscience and education research-based non-profit corporation

888.751.5443
info@mindresearch.net
www.mindresearch.net

@MIND_Research | Facebook/FriendsofMINDResearchInstitute

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Executive Summary

Blended learning involves a setting where students spend part of their instructional time with digital curricula and part of their time learning in a brick-and-mortar setting. Students also have some choice in which content they use, how quickly they go through it, where they do it, and for how long. Schools implement blended learning in a variety of ways and using various types of technology and curricula.

Blended learning is one of the major educational ways of promoting deeper learning by personalizing student skill building, creating new and interesting learning environments, and allowing students to access content more frequently. Deeper learning is centered on depth over breadth, and gaining a conceptual understanding in conjunction with learning procedures. Blended learning environments give students the chance to explore content that provides them with more effective critical thinking tasks and hands-on learning that promote deeper learning.

While blended learning may be implemented in a variety of models such as lab rotation and classroom rotation, the benefits of this educational concept to both students and teachers are clear. Students have more autonomy and choice in pursuing their curricular objectives. The teacher's role shifts to "guide on the side" and affords educators the ability to focus their time and efforts on individuals or small groups of students.

MIND Research Institute's Spatial-Temporal Math (ST Math®) is an ideal instructional tool to be used in blended learning environments. ST Math provides students with a visual approach to math education that is unprecedented in software, giving all students access to learning math through instruction-free learning that focuses on students problem solving and discovering math for themselves. MIND Research Institute is one of the pioneers of the lab rotation models with high fidelity use for more than a decade across a dozen city initiatives. ST Math is being blended into core math instruction as well using class rotation strategies.

MIND Research Institute is committed to applying neuroscience to the challenge of mathematical proficiency in American schools. The founding scientists believe that it is possible to engineer engaging learning pathways that help all students develop the math competencies that will prepare them for college and careers.

This paper covers topics related to the benefits for teachers and for students, in addition to a description of the various ways ST Math can become a part of a district's overall shift to personalized, digital learning. Examples are shared in which ST Math is used as a part of a core mathematics curriculum, in dynamic blended environments, and in a competency-based sequence.

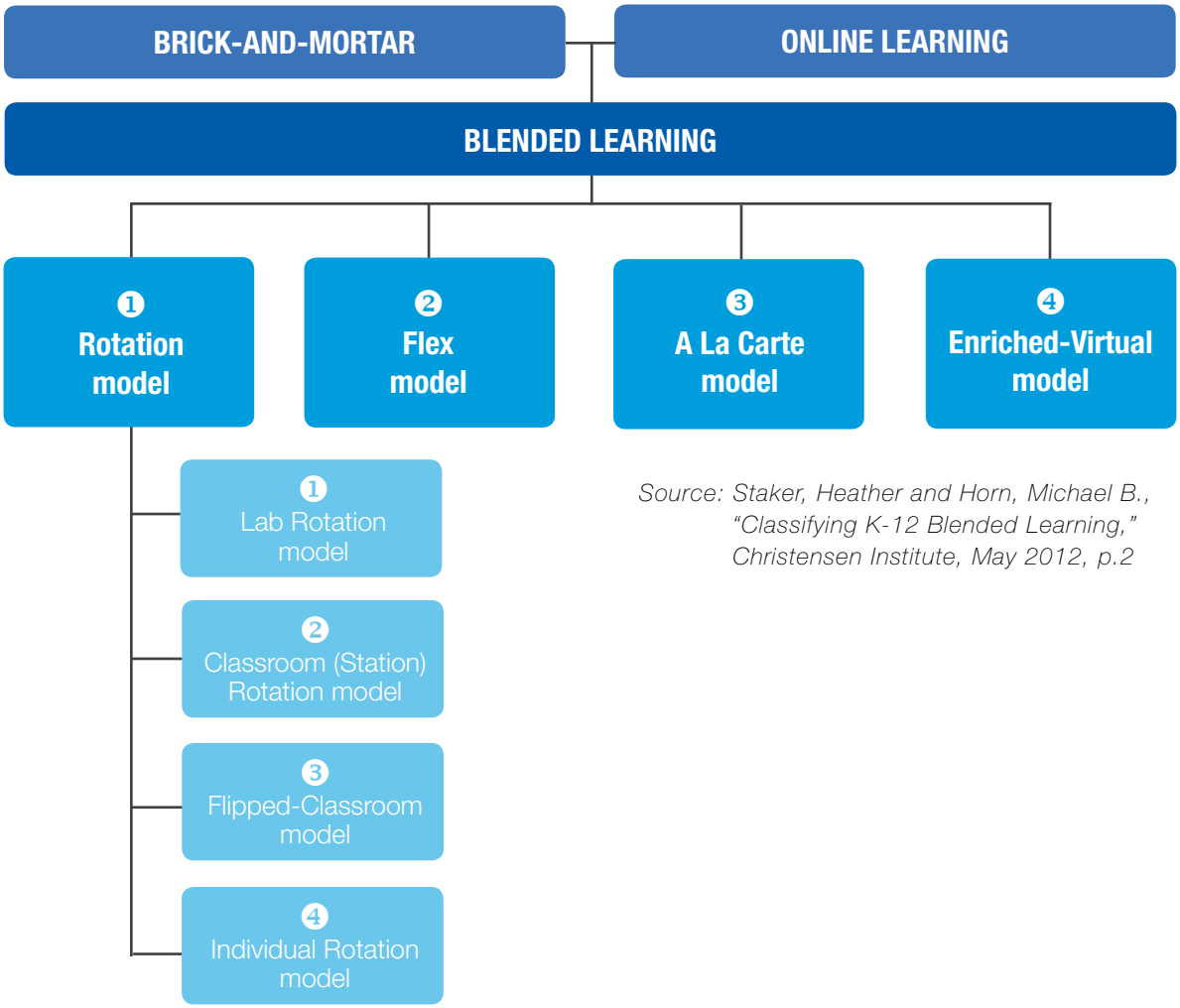
The paper also examines the learning path developed by MIND Research Institute that is used in the development and sequence of every objective addressed in the games students play. The concept of "Experience, Connect, Practice, and Apply" is now used by over 630,000 students in more than 2,050 schools across the United States.

BETTER BLENDS WITH VISUAL GAME-BASED MATH

What is Blended Learning?

Blended learning is "a formal education program in which a student learns at least in part through online delivery of content and instruction with some element of student control over time, place, path and/or pace, and at least in part at a supervised brick-and-mortar location away from home."[1] This method of learning is different from other types of instruction that can be classified as traditional instruction with a technology component or fully online programs. The important distinction for blended learning being that "what students learn online informs what they learn face-to-face, and vice versa." Blended learning gives schools the flexibility to create implementation models that meet students' learning needs in a way that was nearly impossible before.

There are four types of blended learning described by the Christensen Institute: 1) Rotation model, 2) Flex model, 3) A La Carte model, and 4) Enriched-Virtual model. Within the overarching idea of a Rotation model, there are four types of rotations: 1) Lab Rotation model, 2) Classroom (Station) Rotation model, 3) Flipped-Classroom model, and 4) Individual Rotation model.[2]



Source: Staker, Heather and Horn, Michael B., "Classifying K-12 Blended Learning," Christensen Institute, May 2012, p.2

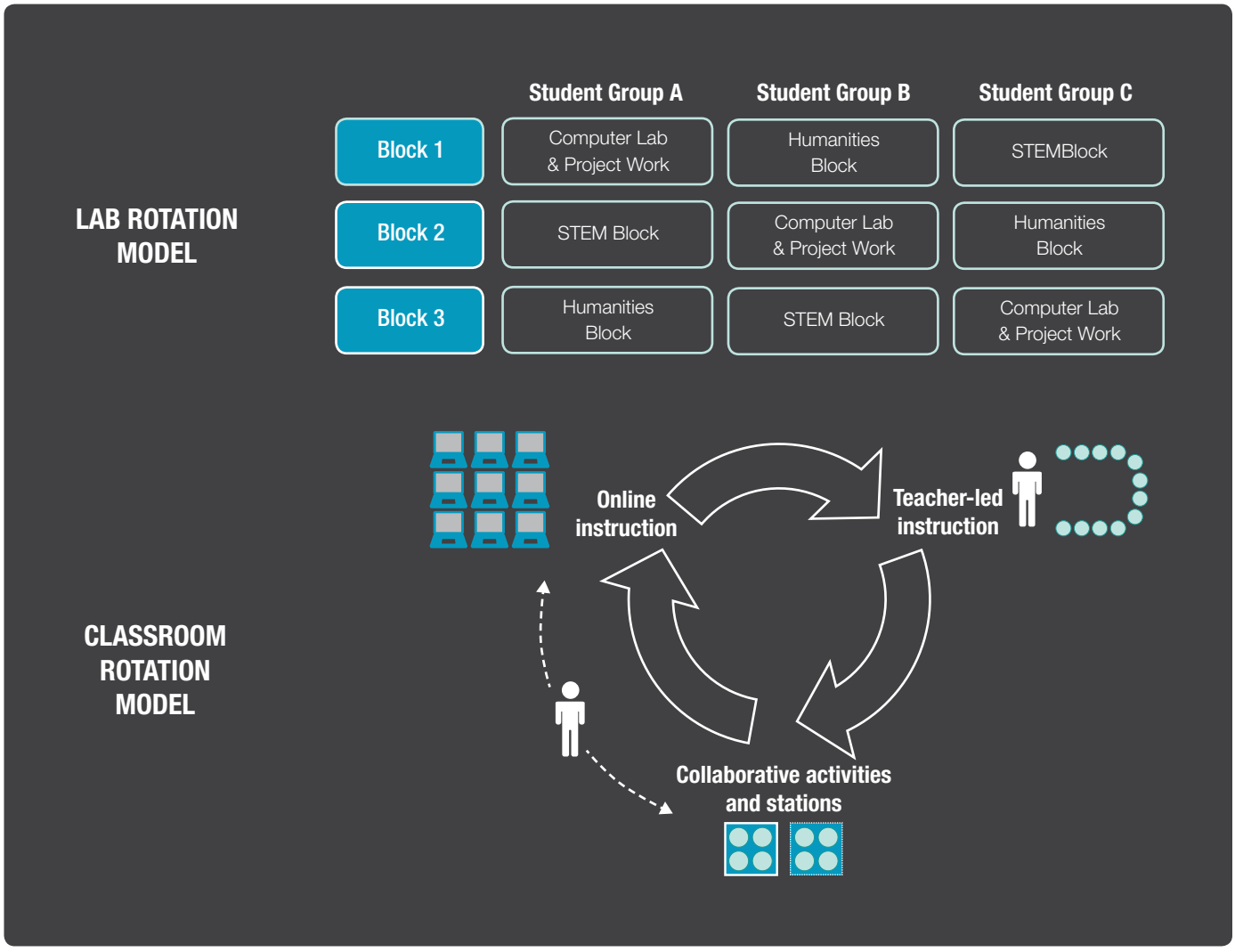
The two models most frequently used in elementary school blended learning environments are described below.

The Lab Rotation Model

This is a Rotation model in which within a given subject students go into the lab on a fixed schedule on a brick-and-mortar campus. Students rotate among rooms at the school.

The Classroom Rotation Model

In this model students rotate within the same classroom on a schedule or when directed by the teacher. The rotation includes at least one station for online learning.



Source: "Blended Learning Implementation Guide, Version 2.0," Foundation for Excellence in Education, Sept. 2013, pp. 26-27

Blended Learning Promotes Deeper Learning

Deeper learning involves skills such as problem solving, critical thinking, effective communication about a subject, collaboration, and learning how to learn.[3] It is imperative that educators in the United States rethink how American students are learning and instill the necessity for deeper learning to develop students who can compete for jobs in the global economy. Digital learning, especially in the form of blended learning, promotes deeper learning through: 1) Personalized skill building, 2) Schools and tools, and 3) Extended access.

Personalized skill building involves students working on individualized paths that meet students where their understanding of a topic ends rather than teaching them strictly based on grade-level standards. When students work at a desirable level of difficulty, they become more intrinsically motivated and learn to persevere through challenges. Schools and tools foster deeper learning by affording collaboration among students and by building a learning environment that works for those students at that site. Enhanced access provides students with options - a much wider set of time when they can access learning materials and the chance to accelerate learning.[4]

The National Research Council (NRC) describes deeper learning as "the process through which a person becomes capable of taking what was learned in one situation and applying it to new situations – in other words, learning for 'transfer.'"[5]

The NRC suggests the following strategies to facilitate deeper learning:

- Use multiple and varied representations of concepts and tasks;
- Encourage elaboration, questioning, and explanation;
- Engage learners in challenging tasks;
- Teach with examples and cases;
- Prime student motivation; and
- Use formative assessments.

The adoption of Common Core State Standards and equivalent standards is a step in the right direction for promoting deeper learning in school settings, and applying effective blended learning models increases the depth and capacity for deeper learning for students and the effectiveness and creativity of teachers. These standards give schools the opportunity to redefine and customize the educational experience for all students.[6]

Blended Learning Changes Education

Blended learning allows schools to shift from a "time above learning" to a "learning above time" approach. Students demonstrate competency and mastery working at their own pace rather than at a pace that is not their own, but is instead tied to grade-level standards. Blended learning also shifts the type and amount of feedback that is provided to students. Students receive real-time informative feedback much more frequently than what is given in a traditional classroom. Blended learning also shifts the role of the teacher from that of lecturer to facilitator. The Alliance for Excellent Education (AEE) describes this as a culture shift in education from a "teacher-centric culture to one that supports learner-centered instruction with an intense focus on the student" and blended learning is already playing a large role in this cultural shift.[7]

Schools utilize technology in order to deliver personalization and customization of instruction to the student. Schools should embrace the use of technology in a novel way in order to allow for student choice and mastery of topics.[8]

Benefits of Blended Learning for Students and Teachers

Blended learning has positive implications for both students and teachers. The new models allow students to have more autonomy and choice in their learning. Using software and accompanying technology, students receive real-time feedback that would be challenging for an individual teacher to provide. Blended learning also imposes transition on the education system to move from a teacher-centric environment to a student-centric environment. This shift gives teachers more freedom to work with small groups or individual students and promotes facilitating deeper discussion and asking open-ended questions that allow for more analytical thinking on the part of the student. The educator role shifts from that of "telling" to "asking."

Teachers want to create experiences for students that promote deeper learning, but building these experiences can be quite difficult due to a lack of time, energy, and resources.[9] Various blended learning models have the potential to create types of teaching and learning that are novel and promote deeper learning. Through these blended learning models, the student's role in learning shifts from regurgitation of facts to critical thinking and problem solving.

ST (Spatial-Temporal) Math and Blended Learning Models

ST Math, created by the MIND Research Institute, offers a blended learning solution through supplementing a strong core curriculum and creating an inherently blended learning environment for students. ST Math is now in use by 630,000 students, 25,000 teachers, in 2,050 schools in 35 states. The software works across multiple platforms, including most desktop and laptop computers and most tablets.

ST Math's approach uses game-based instructional software that boosts math comprehension and proficiency through visual learning. The games use interactive visual animations of mathematical concepts that provide real-time informative feedback to build conceptual understanding and problem-solving skills in all students. ST Math incorporates the latest research in learning and the brain and promotes mastery-based learning and mathematical understanding. ST Math uses gameplay that promotes effective learning by having all the animation and visualizations directly relate to the learning goal.[10] Students work on ST Math individually, focusing on problem solving through figuring out challenging conceptual math puzzles; meanwhile the teacher monitors students during game play, facilitates students who are struggling, and becomes familiar with the visual models used in the software.

ST Math has been used historically in a traditional lab setting, where each elementary school teacher brings his/her entire class into the computer lab to use the program at one time. When ST Math was first implemented in schools, most buildings only had labs and did not have devices accessible to every classroom or every student – necessitating the use of the Lab Rotation model.

The Lab Rotation model takes on other forms with the same principle of all students using ST Math at the same time with the classroom teacher present in a "lab-type" setting that can include mobile carts, bring your own device, and/or 1:1 learning with school-provided technology. With increased access to affordable mobile devices, most districts are improving student access to technology. This is enabling many schools to use ST Math beyond the Lab Rotation model.

ST Math is now frequently used in the Classroom Rotation model. The KIPP Empower charter school in Los Angeles, Calif., was an early adopter of the Classroom Rotation model in which students rotate from small group instruction with a teacher to collaborative activities to online instruction. Eventually class sizes increased beyond a typical KIPP primary school, and two teachers share the services of a paraprofessional that supervises the activities of the students during online instruction. The Classroom Rotation model has the added benefit of a closer link between online and teacher-led instruction.

The Classroom Rotation model existed primarily through a small number of computers in the back of a classroom. As more schools purchase tablets, they deploy them as the device used for the Classroom Rotation model. As the use of tablets grows, students have access to the devices and ST Math at most times during the school day. This flexibility in access allows students to progress through the program more rapidly because they can spend more time on ST Math.

ST Math and the Blended Learning Continuum

The paper, "The Next Generation of World Language Learning" sets up a continuum of implementation models that can be adapted to describe the various ways in which ST Math can complement core classroom math instruction.[11] The power of ST Math as an instructional software tool arises through the transfer of conceptual understanding students gain during the 1:1 time on the software to learning vocabulary and procedures in the classroom. This transfer creates an effective, beneficial and more powerful use for ST Math as a blended learning tool because there is not a significant disconnection between the online learning and what students learn in the classroom. Students also take what they learn in the classroom and practice with the visual models in ST Math, increasing their ability to think about mathematics and communicate with their teachers and other students in the classroom environment.

This paper uses blended world language solutions to explain how core instruction can be combined with digital supplementary materials across various implementation models.[12] The paper explains, "One of the key strengths of a blended learning model is the ability to customize the model to meet the individual needs of a school. Because implementation choices must be driven by the unique learning outcome goals of each school or district, it is difficult to recommend one "best" model for implementation. Additional factors that influence this decision include staffing, available technology, scheduling, and funding."[13]

The Blended Learning Continuum as described in the paper about a language program includes five distinct models that can also be applied to ST Math:

1) Students only use ST Math as the core instruction, with traditional math instruction as ***optional***.
2) Students primarily use ST Math, with traditional core math instruction ***required***.
3) Students primarily use ST Math ***integrated with*** and ***connected to*** core math instruction.
4) Students are primarily in traditional math classroom with ***required*** ST Math components to supplement core instruction.
5) Students are primarily in classroom instruction with ***optional*** time in ST Math for practice.[14]

ST Math in the Core

Items 1 through 3 in the "Blended Learning Continuum" describe instances in which ST Math functions as an integral part of core instruction. In these instances, ST Math is used in various ways ranging from ST Math as the key component of core instruction to ST Math equally balanced with core instruction. In these instances, ST Math serves as a part of an overall math curriculum that includes online instruction, small group instruction, and whole-class instruction.

Encinitas School District in San Diego County, Calif., provides a good example of implementation of ST Math in the core curriculum. In addition to the traditional model of using ST Math as a component of personalized learning, math teachers in the district bring elements of the program into whole-group core instruction.

For 30 minutes per day at least 3 days per week, ST Math is used during the whole-class lesson. Teachers use the games with a projector or an interactive whiteboard to start a conversation around mathematics, connecting vocabulary and procedures from the traditional math curriculum to the visual models used in ST Math.

Stephanie Casperson, Principal at Flora Vista Elementary School in Encinitas, explains that this bridges the gap between what happens in independent online practice and the classroom, encouraging a deeper understanding of difficult math concepts. "Kids understand the process before the teacher has even started teaching."

Teachers across the district participate in training to assure effective implementation. As individual teachers begin to see more efficient learning of units within the curriculum and students gain an upfront, conceptual understanding of material through the use of introductory activities, the role of ST Math in whole-group instruction continues to grow.

A New Digital Core. *For most of the last century, most school districts thought of a mathematics curriculum as a sequence within an adopted textbook, supplementing instruction with additional materials. Starting in the 1990s, supplementary materials often included computer games. Beginning around 2000, digital courseware became common in secondary and higher education. With the introduction of the iPad and tens of thousands of applications in 2010, the mobile revolution kicked into high gear.*

The trend continues to pick up steam. Over the next few years, most American schools will shift from print to predominantly digital instructional materials. Some districts and schools will adopt a primary digital text or courseware the way they did textbooks (e.g.,1 and 2 on the Blended Learning Continuum, but many will use a blend of several components into a flexible core curriculum that allows multiple pathways for students (e.g., 3 and 4 on the continuum).

ST Math in Dynamic Blends

Items 4 and 5 in the "Blended Learning Continuum" describe instances in which ST Math is used as a supplement to a core instructional program such as a traditional textbook that either requires practice in ST Math or offers students optional time in ST Math.

One of the top benefits of blended learning is the ability of educators to constantly adjust the structure of their programs and create the best mix of instructional components to meet student needs. Cornerstone Charter School[15] in Detroit uses three different blended learning models in grades K-9 under one roof. Rocketship Education[16] continually evaluates the components in its learning lab. They use ST Math as a Tier 1 Response to Intervention program for all K-5 students with a usage goal of 40 minutes per week in a Flexible Classroom model. Then, they refresh or realign the content on the first of every month to follow the scope and sequence of individual schools and teachers. The school finds ST Math is especially useful for English language learners because of its reliance on conceptual understanding without auditory directions or language prompts.

ST Math in a Competency-based Sequence

Several new blended school models, including the Education Achievement Authority (EAA)[17] in Detroit, offer students standards-aligned units of study and/or playlists of content modules providing several ways to learn, practice, and demonstrate mastery. With these integrated but differentiated core instructional programs, each student progresses on an individualized pathway as he/she demonstrates readiness.

ST Math is suited for use with one or two other instructional materials such as a traditional textbook and/or other math software to create a full unit of study of playlist. Usage and mastery data from ST Math can be combined with formative results from other instructional programs and/or periodic benchmark assessments to determine overall mastery.

A competency-based elementary program can be easier to facilitate in a multiage environment. Using separate grouping strategies for English Language Arts (ELA) and math with specialist teachers is another alternative. EAA K-8 schools have 19 instructional levels allowing for more dynamic grouping than traditional grade levels.

In their first year using a standards-based grading method, The Starr Detroit Academy[18] used ST Math as part of a competency-based math program in a Classroom Rotation model. Students demonstrate levels of mastery in order to progress. ST Math serves as an independent practice component of the math curriculum. The overall curriculum is identified as blended learning math instruction with 90-minute, daily blocks. The teacher plays a large part in consistently and constantly analyzing student progress and fluency. Several assessments are used together with ST Math to determine student growth measures and assure accurate placement. NWEA diagnostic assessments are used to identify at which grade level students will begin work on ST Math and a partnership with the Achievement Network has allowed for the use of Common Core-aligned interim assessments, which are taken four times per year. The administration works with educators to use the ST Math data combined with data from these additional assessments to drive instruction.

ST Math and Deeper Learning

It is instructive to understand the critical design principles that underpin the program for the student 1:1 experience with ST Math and for the teachers. ST Math is designed to introduce mathematical concepts as puzzle-type games with the language and symbols removed. It provides rich interactive learning experiences for all students beginning in kindergarten and continuing into middle school. Students who are able to use pattern imagery to solve math problems exhibit a deeper conceptual understanding of math topics and are better able to abstract and generalize.[19] ST Math builds students' pattern recognition, enabling them to solve non-routine problems.

ST Math addresses all of the National Research Council's suggestions for facilitating deeper learning.

Use multiple and varied representations of concepts and tasks

- Every ST Math objective, which is a learning trajectory to learn a math topic, contains multiple visual representations of the topic, increasing student ability to apply and transfer knowledge to new situations.

Encourage elaboration, questioning, and explanation

- Because ST Math is language-free and includes no instructions, teachers are taught to be facilitators, asking open-ended questions to promote student thought and explanation.

Engage learners in challenging tasks

- Each level of ST Math introduces a new element that engages students in a desirable level of difficulty that challenges them in an appropriate way.

Teach with examples and cases

- MIND Research encourages teachers to use ST Math in the classroom setting to round out the blended learning environment with a holistic view of math learning.

Prime student motivation

- Students become intrinsically motivated to learn, play ST Math, and persevere through challenging content because they learn what it feels like to succeed when challenged.

Use formative assessments

- ST Math includes a pre- and post-quiz for every objective in order to increase student metacognition about what they are learning and to inform teachers.

ST Math Benefits Students and Teachers in Blended Learning Models

ST Math results are remarkable considering that it is typically used to supplement a traditional core curriculum. The program is designed to extend and apply a core curriculum and, because of the individualized nature of the program, some students move more quickly or slowly than whole-group instruction. The implementation of Common Core State Standards and the next generation of state assessments have whetted the appetite for high-quality tools and content like ST Math that can personalize instruction. At its core, the shift to blended learning is premised on the promise of customized learning to improve student outcomes.[20]

ST Math has many benefits for students, some of which are easily measured such as increases in standardized test scores and others that are less simple to quantify. From a measurable, mathematical proficiency standpoint, ST Math has proven to increase student proficiency on standardized tests. The program also directly affects growth of students' executive functions. Students develop incredible persistence in problem solving (one of the Common Core Practice Standards) through playing at desirable levels of difficulty that are intentionally built into the software. The program does not provide students with hints, or resort to telling them the answer. As a result, students learn by paying close attention to the real-time informative feedback they receive in response to their individual answers.

ST Math's focus on persistent problem solving has been shown to have a dramatic impact on students' motivation and attitude towards math. MIND Research Institute measures student motivation and attitude through an annual survey of teachers in classrooms using the ST Math program. In June of 2013 MIND Research surveyed approximately 1,180 teachers, which produced the following results:

"ST Math has made math learning more fun for my students and for me."
– 90% Agree or Strongly Agree

"ST Math has engaged students who are usually difficult to engage productively."
– 84% Agree or Strongly Agree

"ST Math has improved the attitude of my students towards math."
– 85% Agree or Strongly Agree

Teachers notice changes in student behavior and an increase in softer skills after only a short amount of time. Students engage strongly with ST Math because they are problem solving, discovering, and trying new puzzles regularly. Students are intrinsically motivated to continue to play because they are consistently surmounting challenges. Psychological research has shown that extrinsic rewards have negative effects on students' intrinsic motivation to learn.[21] ST Math capitalizes on students' drive to achieve competence within game-play through problem solving and attainment of mastery on each level to increase their motivation around math learning. When playing ST Math games, students do not expect any tangible, extrinsic rewards that are present in most educational software that rely on the tenets of gamification to motivate students.

MIND's ECPA Learning Path and Blended Learning

ST Math is built on a four-step learning path:

Experience ▸ Connect ▸ Practice ▸ Apply

The ECPA learning path was developed by the MIND Research Institute as a model for the learning process. Research suggests that engaging with cognitively challenging mathematical tasks, namely those promoting flexible thinking, reasoning and problem solving, is a primary mechanism for promoting conceptual understanding of mathematics,[22] and that the 15 types of mathematical tasks, or experiences that students have significantly influences what they learn.[23] Based on these research findings, MIND spent time fully developing ECPA and creating the software to support the path.

Experience: The Experience piece of the learning path is the technological component of blended learning. Students work 1:1 with ST Math, gaining problem-solving skills in a language-free environment. Each objective begins with students solving challenging problems posed entirely visually. Students engage in a deep, conceptual gameplay experience that gets them involved in making sense of mathematics for themselves. Every puzzle provides real-time informative feedback that adapts to individual in-game actions, allowing students to try their own solutions, make mistakes, and learn from those mistakes.

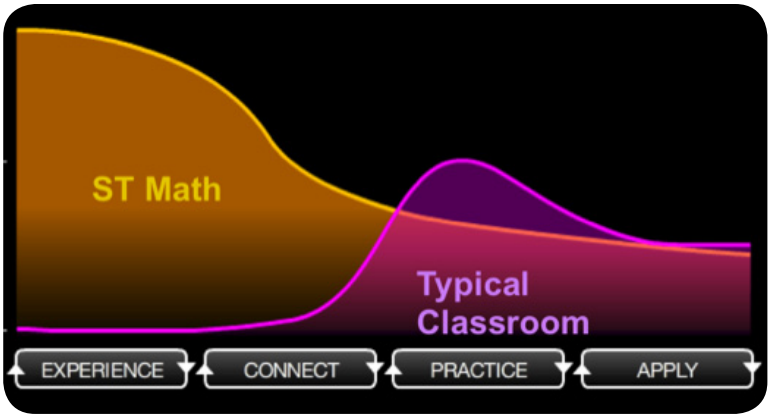
During this time students determine their own pace through the program, which is one of the critical components for the online portion of blended learning.

This teacher is using ST Math in the classroom as part of a math lesson.

Connect: This element of the learning path involves students and teachers building the bridge in understanding between conceptual and procedural mathematics in a blended learning environment. Once students solve the initial experience puzzles, they begin to develop an intuition about the mathematics being taught (building their internal schema). At this point, it is important to connect these new ideas to previous math content, and to other mathematical representations.

Classroom discussion of interesting puzzles and students' solution strategies is a valuable part of this process. ST Math provides professional development that helps teachers understand their important role in the Connect phase and how to facilitate students as they develop their conceptual understanding. Research shows that developing conceptual understandings and procedural skills feed on one another in an iterative process.[24] As teachers discuss the concepts students learn on ST Math and directly tie them to procedures in the classroom, students are able to deepen their understanding of both.

It is worth noting that in the traditional classroom model, and in most mathematics educational software, the Experience and Connect phases of the learning path are generally less prominent than they are in ST Math. Typically students are told how to perform a new mathematical procedure/algorithm by watching a lecture or a video, and then moved directly to the Practice phase. In general, implementing the Experience and Connect phases of the learning path is a challenging task for many teachers. Creating hands-on, conceptual experiences for students in the classroom requires teachers to have deep content knowledge. And for that experience to be effective, all students need to receive real-time informative feedback on their ideas as they try them out, which is practically impossible given the large class sizes in many areas. However, with ST Math, all teachers can provide direct access for all students to these critical phases of the learning path, which makes ST Math an even more powerful blended learning tool.



ST Math provides all students with the same hands-on learning experience that is challenging to produce in a classroom.

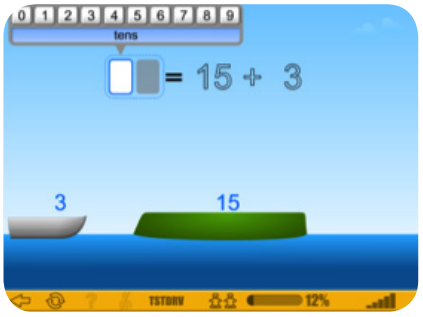
Practice: Once students have developed a good conceptual understanding of a mathematical idea or procedure, they need opportunities to practice and develop fluency. This can happen in both areas of blended learning – on the device and/or in the classroom.

In a single grade level of ST Math, students will solve approximately 4,000 puzzles, many of which are classified as L.I. or "Language Integration" with the mathematical symbols or key vocabulary embedded into the games.

Students are exposed to various visual models that represent the same math concept. Research has shown that variability during practice may slow practice down, but the variation leads to better long-term retention of the concepts and information.[25] Multiple external representations of a math topic support cognitive processes in learning and problem solving, specifically on computers.[26] ST Math places the cognitive load on the students during 1:1 time to translate between representations, and the teacher is expected to make those connections explicit for students during class time.

Apply/Generalize: Once students conceptually understand a mathematical idea, and can use/perform it fluently, to complete the learning path they need to apply it and generalize their understanding. In a traditional math class using text-based materials, this is done typically with word problems. Word problems are a limited version of an application task, and in most cases they are nothing more than a word-based version of the same problems students have been solving previously. In order to generalize mathematical understanding students need to be challenged with new situations that require them to model with the mathematics they have learned.

ST Math harnesses the benefits of blended learning to create a comprehensive environment where students learn at their own pace and develop fluency on the software, and then communicate and make connections through interactions with other students and teacher instruction.



Example of a visual model incorporating symbols in ST Math.

Conclusion

The shifts to college- and career-ready standards and the next generation of online assessments create a once-in-a-generation opportunity to reimagine teaching and learning. As schools and districts across the country implement the new standards and assessments, teachers and educational leaders increasingly are exploring the potential of technology to bridge the gap between the outdated factory model and what the Hewlett Foundation refers to as "deeper learning competencies."[27]

The educational technology market has risen to meet increased demand with countless sources of content, instruction and resources now available to schools and districts. Solutions like ST Math offer evidence-based, research-backed content with proven results.

For example, Change the Equation *(http://changetheequation.org)*, an initiative to mobilize the business community to improve the quality of STEM learning in the United States, recognized ST Math as a program that consistently yields positive results for students. Similarly, Business Roundtable *(http://businessroundtable.org/media/news-releases/business-roundtable-recognizes-five-programs-for-outstanding-work-i)* recognized ST Math as an "Outstanding" K-12 STEM education program. And, a study by WestEd validated MIND Research Institute's methodology for evaluating student achievement proficiency in the Los Angeles Unified School District. Increases in proficiency realized in Los Angeles through the use of ST Math have been confirmed in comparable urban areas such as Baltimore, Chicago, Houston, Las Vegas, Minneapolis, New York, Orlando, Philadelphia, Seattle and Washington, D.C. [28]

Harnessing the power of blended learning is an obvious choice for educational leaders who are approaching the new standards and assessments as a way to personalize instruction and better prepare students to be college- and career-ready. This paper illustrates the potential to use ST Math as a proven blended learning solution with flexibility as a supplement to a traditional curriculum, part of a dynamic blend, or the core component of an innovative, competency-based approach.

MIND is closing the "experience gap" and building a pathway to proficiency for millions of students in America and worldwide.

Author Bios

Nigel Nisbet
Director, Content Creation

Nisbet began his education career by teaching a class of 15 at an idyllic private all-girls school in rural England. After moving to the U.S., Nisbet taught Mathematics, AP Physics, and AP Computer Science at Van Nuys Senior High, where he was a pioneer of integrating technology into the classroom, and utilizing project-based learning to engage students' critical thinking skills. At Van Nuys, he successfully spearheaded the implementation of the LAUSD Los Angeles Virtual Academy program as a solution for Algebra 1, and collaborated with AP Readiness Program in Computer Science.

Leaving the classroom in 2006, he became a Mathematics Specialist for the Los Angeles Unified School District, where he designed and delivered professional development programs and implemented the transition to Response to Intervention (RTI) programming. He has written, designed and implemented several instructional guides and curriculum, focusing on middle school and high school math (Grade 6 and 7; Algebra Readiness; Algebra 1 & 2; and Geometry).

Nisbet joined the nonprofit MIND Research Institute team as Senior Mathematics Specialist in the spring of 2010, becoming the Director of Content Creation in early 2011. At MIND, Nisbet devotes his time to reaching into the structure and beauty of mathematics and finding ways to build engaging, interactive and completely visual games that teach all students how math really works.

Dana Luther
Associate Product Manager

A previous math educator, Luther has combined experience with training and building strategic plans for increasing impact on student learning. She now works with MIND Research as Assoc. Product Manager, facilitating collaboration between engineering and other departments for releases and program launches. She is responsible for program roadmaps, participating in requirements writing with the engineering team, writing collateral and gathering information that influences prioritization of projects.

Disclosures

MIND Research is a Getting Smart Advocacy Partner.

Endnotes

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[11] The original model described by Rosetta Stone by Getting Smart describes a balance of online curriculum from Rosetta Stone and traditional language instruction. "Online curriculum" has been replaced by "ST Math" for purposes of this example.

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