



EdTech Partnerships **Key Findings**

2021–2022 Report

About EdTech@ WestEd

WestEd is a nonpartisan, nonprofit research, development, and service agency based in San Francisco, California. WestEd works with education and other communities throughout the United States and abroad to promote excellence, achieve equity, and improve learning for children, youth, and adults. The EdTech@WestEd team is a leader in education technology research. We have extensive experience conducting research and evaluation for small businesses and entrepreneurs in the education technology sector. Our EdTech team strives to provide our clients with actionable research and insights that help improve their product development and increase impact. We offer expertise in education research, academic content areas, learning science, and product implementation.



Our Small Business Innovation Research Partnerships

Since 2013, WestEd has served as the research partner for more than 50 successful Small Business Innovation Research (SBIR) Phase I, Phase II, and FastTrack proposals from the Department of Education, Institute of Education Sciences; National Science Foundation; and National Institutes of Health.

The following 2021 SBIR Phase I projects showcase the types of EdTech partnerships that WestEd has established and the impact that each project has on promoting success for every learner.

BrainQuake

How can math assessments be more fun and engaging? BrainQuake aims to increase math problem-solving skills through perceptually rich puzzles. Algorithms in the platform track students' progress and select appropriate puzzles from a large database to ensure that students progress at their own pace.



BrainQuake puzzles that engage integer-arithmetical thinking (left), proportional reasoning (middle), and linear growth and algebraic problem-solving (right).

GOALS AND STRATEGY

Our study investigated whether BrainQuake puzzles can be used as math assessments.

Research Questions:

1. Does performance on BrainQuake puzzles relate to performance on traditional multiple choice math items?
2. If the two types of performance are linked, can BrainQuake puzzles potentially serve as math assessments?

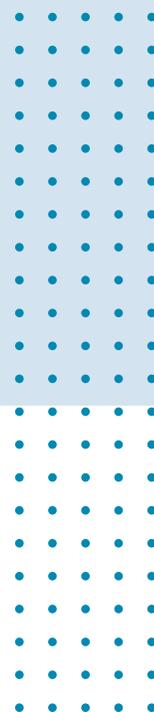
The sample consisted of 238 5th and 6th graders from middle schools in California and New York. Students completed 10 BrainQuake puzzles, 10 transfer puzzles on proportional reasoning, and 10-item multiple-choice

tests. The multiple choice items were selected from a state-based accountability test on grade-appropriate math standards for proportional reasoning.

KEY FINDINGS

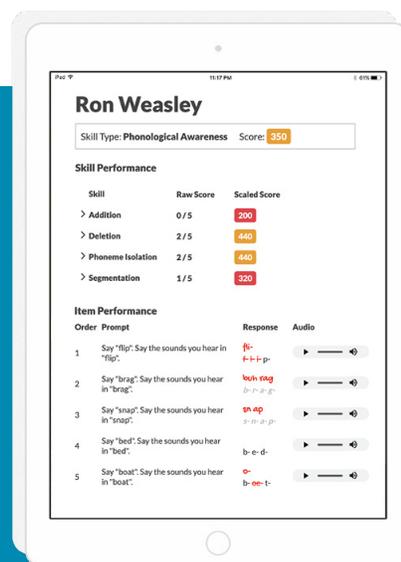
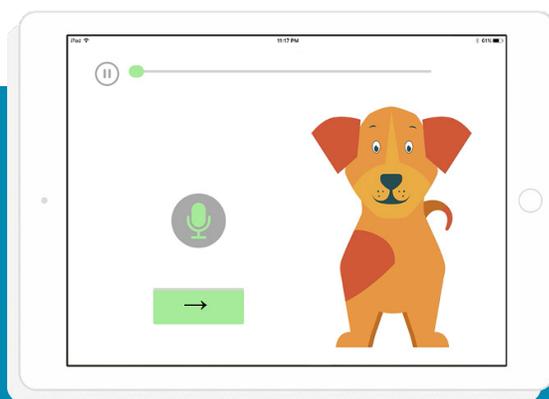
- BrainQuake puzzles reveal what students know about proportional reasoning.
 - » Performance on BrainQuake problem-solving tasks showed a positive and statistically significant relationship to performance on the traditional multiple-choice math items. These findings suggest that BrainQuake puzzles may show what students understand about proportional reasoning.

- BrainQuake puzzles have the potential to serve as math assessments.
 - » Given this finding, BrainQuake aims to further support students and teachers in understanding their math thinking by creating additional puzzles that cover a broader range of math concepts that can be used as assessments.



Literably

How can teachers better understand why students are struggling with reading? Phonological awareness, the ability to identify and manipulate the sounds in spoken words, is strongly linked to reading ability. Phonological awareness can be taught, but only when educators can identify which students have these challenges. Literably provides teachers with an education technology platform that assesses phonological awareness: the Literably Assessment of Phonological Awareness (LAPA). This online assessment combines the accuracy of a specialist-administered assessment with the efficiency and accessibility of a computer-administered assessment. LAPA prompts students to complete phonological awareness tasks aloud and scores their oral responses, using a mixture of human transcription and automatic speech recognition. Within 24 hours, teachers have access to their students' scores on the Literably dashboard, which they can use to tailor student instruction.



GOALS AND STRATEGY

Our study asked how well Literably measured student needs and whether teachers found the system easy to use.

Research Questions:

1. To what extent does LAPA provide appropriate opportunities for students to demonstrate their proficiencies in phonological awareness?
2. To what extent does LAPA reliably discriminate between students who are at different levels of proficiency? To what extent does it predict performance on other measures of phonological awareness?
3. To what extent are LAPA online resources (including tasks, rubrics, and score reports) usable and supportive of teachers in evaluating their students and in making instructional decisions?

Over 400 (n=430) students from more than 25 classrooms participated in a pilot of the assessment in classrooms.

During the study, the recruited teachers gave the assessments to their students individually. WestEd also collected student performance data on STAR Early Literacy and Reading assessments.

KEY FINDINGS

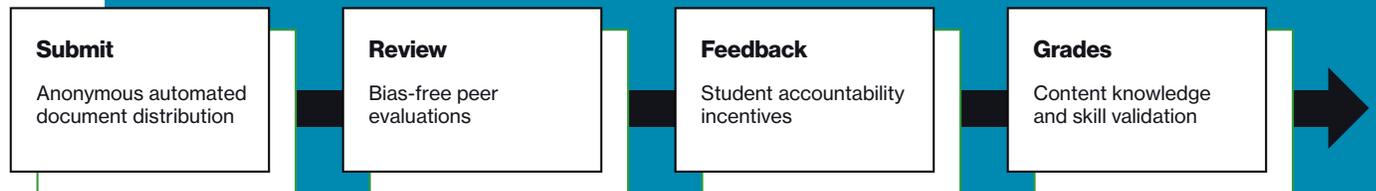
- Literably helps teachers identify students struggling with phonemic awareness.
 - » Our findings suggest LAPA is usable as an assessment for the critical early literacy skill phonemic awareness.
- Literably was easy to use in classroom settings.

» In addition, the assessment functioned effectively in classroom settings. Few teachers experienced technical difficulties during the study implementation, and teachers preferred the computer-based system to more traditional measures requiring paper/pencil or student-selected responses.

- Future versions of Literably may provide teachers with additional details about their students.
 - » Our analyses found that LAPA reliably measures phonological awareness and may, with future analysis, be able to report both an overall score and reliable scores pertaining to relevant subskills (e.g., blending, rhyming, segmentation).

Peerceptiv

How can students learn to provide meaningful feedback to their peers? Most teachers give multiple-choice or short-answer assessments because they are easy to administer and score. However, peer assessment offers a more holistic measure of content knowledge while simultaneously developing critical thinking and other essential 21st-century skills. In this Phase I SBIR, Panther Learning adapted its research-validated higher education peer assessment system for use in high school STEM (science, technology, engineering, and math) classrooms. The result is Peerceptiv, a new teacher dashboard that quickly identifies which students need intervention and that allows teachers to adapt learning to individual students' needs.



GOALS AND STRATEGY

Our study investigated the classroom feasibility of Peerceptiv, whether it allows students to reliably and accurately assess peer performance, and whether students think the system improves their learning.

Research Questions:

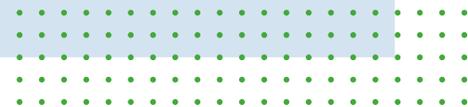
1. Are students and teachers able to incorporate the Peerceptiv system as intended in their classroom?
2. Can students reliably grade their peers' performance assessments?
3. Are students' ratings accurate (i.e., valid)?
4. Do students perceive the peer-rating exercise and the Peerceptiv system to be beneficial to their learning?

Teachers used Peerceptiv with their students for four to five days. Both teachers and students completed a product survey developed by WestEd to examine the feasibility and perceptions of the platform. Teachers also participated in a post-study interview with a WestEd researcher.

KEY FINDINGS

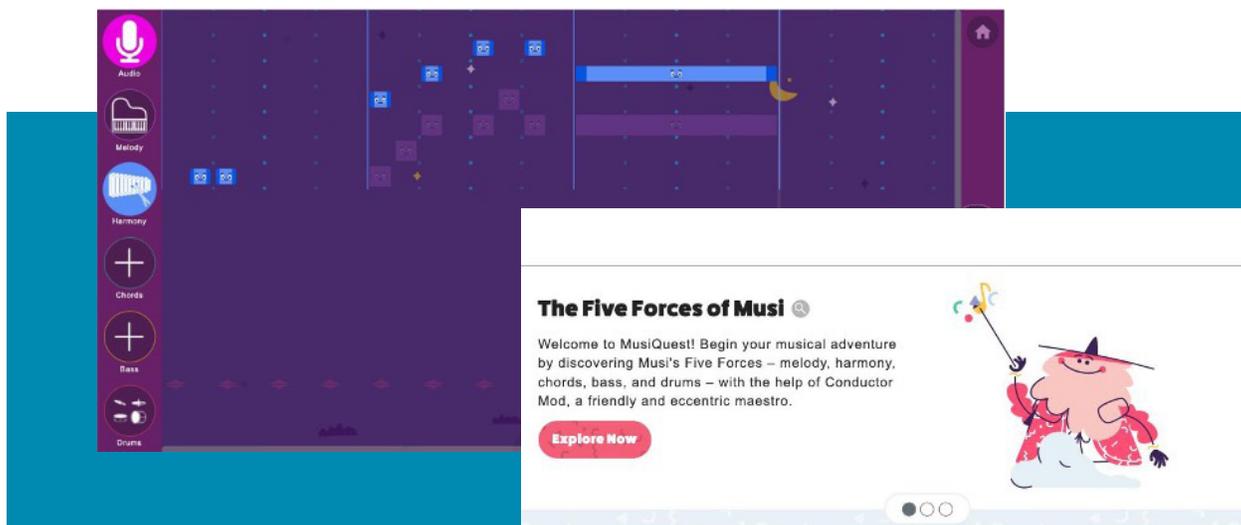
- Peerceptiv was easy for students to use.
 - » Overall, students were able to navigate and use the Peerceptiv platform easily. The majority of students (74%) agreed that they were able to use Peerceptiv on their own without anyone helping them, and 77% of students felt Peerceptiv was easy to use.

- Peerceptiv provides students with more robust and useful feedback.
 - » Teachers reported that the product was feasible and effective as an assessment tool. Preliminary analysis suggests that the Peerceptiv platform is a reliable and accurate form of assessment feedback.



Edify

How can non-music teachers help their students learn fundamental musical concepts? Edify Technologies, Inc., developed MusiQuest, a browser-based software platform for teaching core music concepts. The online platform provides a teacher dashboard, a student portal, a composition interface called Song Builder, and lessons that can be used at schools without a formal music program.



Students begin their musical adventure by discovering Musi's Five Forces—melody, harmony, chords, bass, and drums—with help of Conductor Mod, “a friendly and eccentric maestro.”

GOALS AND STRATEGY

Our study explored MusiQuest's impact on students' engagement with and knowledge of music and their attitudes toward music and the arts.

Research Questions:

1. To what extent do teachers implement MusiQuest as intended? How do students engage with MusiQuest?
2. Does using MusiQuest increase students' knowledge of music in the target module?
3. Does using MusiQuest increase students' self-efficacy and attitudes toward music, the arts, and careers in the arts?
4. What modifications to MusiQuest would maximize its value and feasibility for use in homeroom classes?

Five elementary teachers and their students participated in a classroom feasibility study. Teachers used a MusiQuest module called Musical Ensembles Quest, which includes three 30-minute lessons on solos and duets, small ensembles, and large ensembles. Teachers administered researcher-developed pre- and post-assessments to students, intended to measure student understanding of the music content provided within each quest.

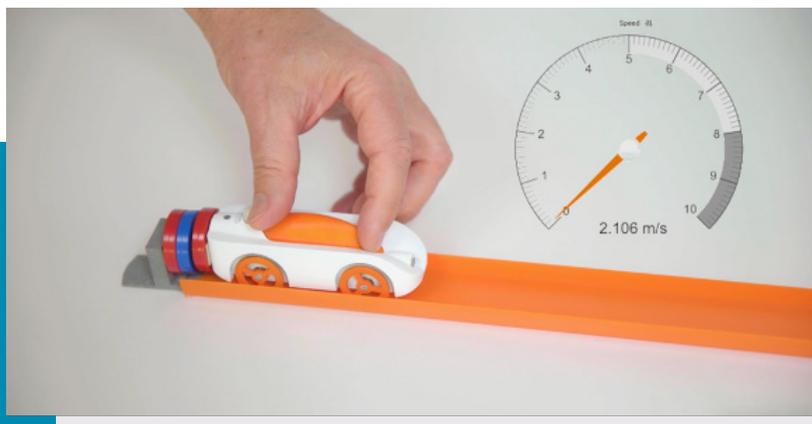
KEY FINDINGS

- Students enjoyed using MusiQuest.
 - » 81% agreed that they want to use MusiQuest more, 88% agreed that they enjoy using MusiQuest, and 89% agreed that it helped them learn music. Student scores showed statistically significant improvement from the pre- to the post-assessment.

- Teachers found MusiQuest easy to use and engaging.
 - » Teachers reported that MusiQuest was easy to use in their classrooms; had a positive impact on students' self-efficacy and attitudes toward music, the arts, and careers in the arts; and was engaging for students.

Myriad Sensors Inc.

How can students get hands-on experience with forces? Myriad Sensors Inc. developed the PocketLab G-Force system—a Hot Wheels–sized car with embedded sensors for measuring velocity, acceleration, and force—for use in hands-on activities in science classrooms. The G-Force car was integrated into an existing collaboration tool called PocketLab Notebook.



GOALS AND STRATEGY

How does the PocketLab G-Force system work in real classrooms? Our study investigated the system's classroom feasibility and whether it engages students and helps them understand key science concepts and practices.

Research Questions:

1. Is the PocketLab G-Force system feasible for classroom use?
2. Are students engaged by the system in a way that enhances development of science and engineering practices and supports student understanding of data visualization?

Two teachers and their 35 students, 6th through 8th graders, participated in the classroom feasibility study. The students completed a force and motion activity using the PocketLab G-Force and Notebook systems. Students completed a content

assessment before and after the G-Force activity, which was designed to measure student ability to read force and motion graphs. Students also completed an engagement survey, intended to elicit their attitudes about learning science as a result of using the G-Force system.

KEY FINDINGS

- The PocketLab G-Force system was easy to use in classrooms.
 - » The study found that teachers and students were able to successfully and easily use PocketLab G-Force in their classes.
- PocketLab G-Force encourages collaboration and engagement.
 - » Teachers reported high levels of student scientific collaboration while using the G-Force system. A majority of students reported that the activity was “fun” (79%)

and “easy to use” (85%) and that they found themselves “staying on task” (91%). Teachers reported that students who are typically less engaged in a science classroom were participating in the classroom activity and were engaged in scientific discourse with their peers.

- Additional studies are needed to determine whether PocketLab G-Force improves student understanding.
 - » Findings from the student content assessment indicated no significant difference in overall understanding of force and motion concepts and visualization from the pre- to the post-assessment. This result was expected, given the short duration of the intervention.

Partner with WestEd

WestEd continues to partner with EdTech companies and school districts every school year. If you are interested in staying informed about opportunities to use education technology products in your school and district, email EdTech@WestEd.org.

For more information, visit our website: EdTech.WestEd.org



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