AccelerateLEARNING
THE LEADER in STEM EDUCATION

IMPACT & RESEARCH REPORT

2024

Executive Summary

In 2024, the Accelerate Learning (ALI) research team conducted numerous research activities across all ALI's products. These include:

- 12 efficacy studies (including 2 meta-analyses)
- 4 product use studies
- 6 case studies
- 7 customer advisory board activities and customer surveys
- 3 dissemination
- 16 grants and upcoming projects

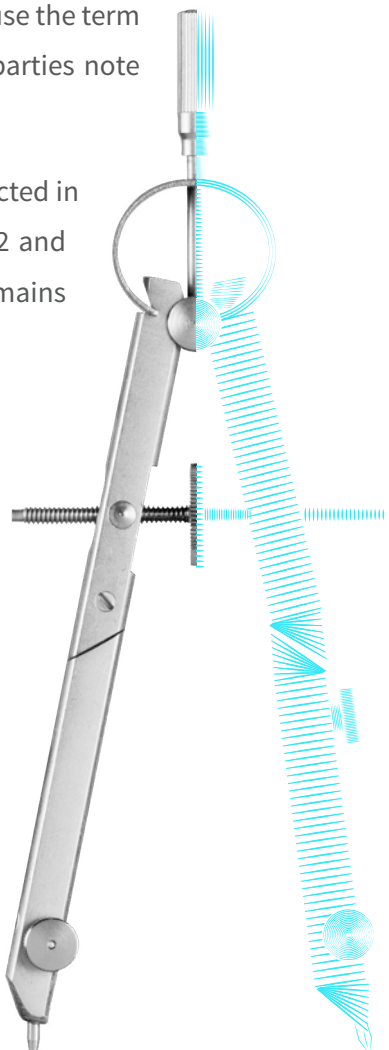
In total, the research team executed and finalized more than 30 activities and 16 more are in progress as we continue to expand the evidence that ALI STEM products are world class.

To date, ALI has received over $12.6 million to support research and we have applied for an additional $16 million ($4.5 of which would fund ALI research directly).

In each section, we describe the research activity type and why it is important. Studies are then broken out by product. If ALI conducted the study internally, we use the term "We" to indicate who conducted the research; evaluations by external parties note explicitly who partnered with us to conduct the study/activity.

In the following report you will see a brief overview of all activities conducted in 2024, although data for many studies include data gathered across 2022 and 2023. When possible, the full studies are linked, but the website still remains your best resource:

acceleratelearning.com/research



🔗 The callout icon within this report denotes active hyperlinks.

BY THE NUMBERS

Kide Science

32
COUNTRIES

30K+
REGISTERED EDUCATORS

1M+
CHILDREN REACHED

200K+
LESSON PLAN VIEWS

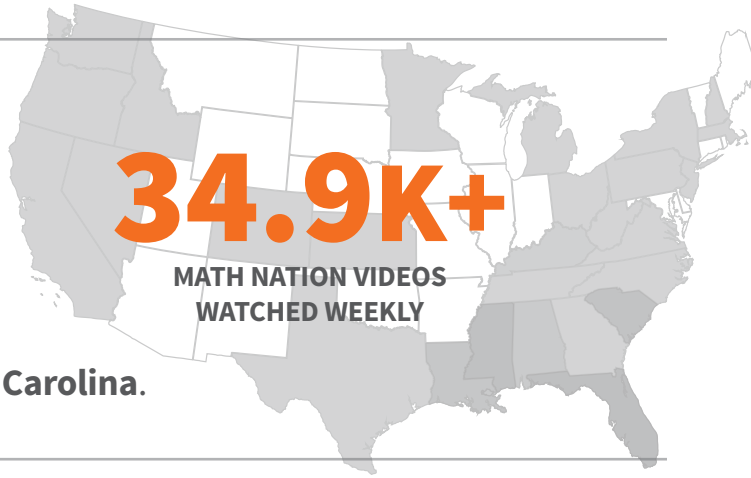
In 2024, Kide Science was used in **16 states** in the US, with the largest user bases in **Texas**, **Georgia**, and **Florida**.

Math Nation

5.1K+
SCHOOLS

223.2K+
STUDENT LOGINS

34.9K+
MATH NATION VIDEOS WATCHED WEEKLY



In 2024, Math Nation was used in 27 states, with the largest user bases in **Florida**, **Mississippi**, and **South Carolina**.

STEMscopes (Math + Science)

13.2K+
SCHOOLS

5.5M+
STUDENT ACCOUNTS*

217.6K+
EDUCATOR/STAFF ACCOUNTS*

738K+
HANDS-ON EXPLORE ACTIVITIES ACCESSED BY A TEACHER IN STEMSCOPES SCIENCE OR MATH

Based on the number of schools above, **~18% of the nation's schools** (public or private) across all 50 states are using STEMscopes* products, with the largest user bases in **Texas**, **Florida** and **California**.

**across STEMscopes Science, Math, and supplemental products (including private school students)*

NISE

CAMPUS STEM CERTIFICATE (NCSE)

19 schools completed the National Certificate for Stem Excellence (NCSE); **18** are in progress.

14 schools completed the National Certificate for Stem Excellence - Recertification (NCSE-R), while **12** more are in progress.

117 schools total, across **16** states (and **3** countries), have achieved National Certificate for STEM Excellence (NCSE) distinction.

TEACHER STEM CERTIFICATE (NCST)

~1,388 educators earned the National Certificate for STEM Teaching (NCST), with **1,803** more in progress.

Among the NCST-certified educators, **763** have requested NISE to transfer their certificate to American College of Education (ACE) to receive graduate credits.

8,200+ educators, spanning all **50** states, have earned their NCST since 2016.

MICRO CERTIFICATES

~14,198 STEM micro certificate licenses were requested in 2024.

Efficacy Studies

Efficacy in education is often defined as “the power of a product/intervention to produce the desired effect.” ALI’s efficacy studies seek to show the effect of our products on STEM outcomes in real-world settings. We design our studies to match the higher tiers of the Every Student Succeeds Act (ESSA) and the standards of evidence of the What Works Clearinghouse (WWC). With these studies, we want to demonstrate to schools that our products are research-supported as the best products on the market.

KIDE SCIENCE

Kide Science Gives the Joy of Learning

Teachers play a key role in whether children have opportunities to engage in STEAM learning. Therefore, understanding how Kide Science supports teachers’ self-efficacy and enjoyment of STEAM teaching is crucial to understanding the efficacy of Kide. Our recent white paper delves into how Kide Science can transform STEM teaching for early years educators. The paper includes a mixed-method approach, using both qualitative and quantitative data from surveys and interviews with early childhood teachers (n=116) from the US, UK, and Finland. Three key themes were identified in the data, which related to Kide’s impact on strengthening teachers’ confidence.

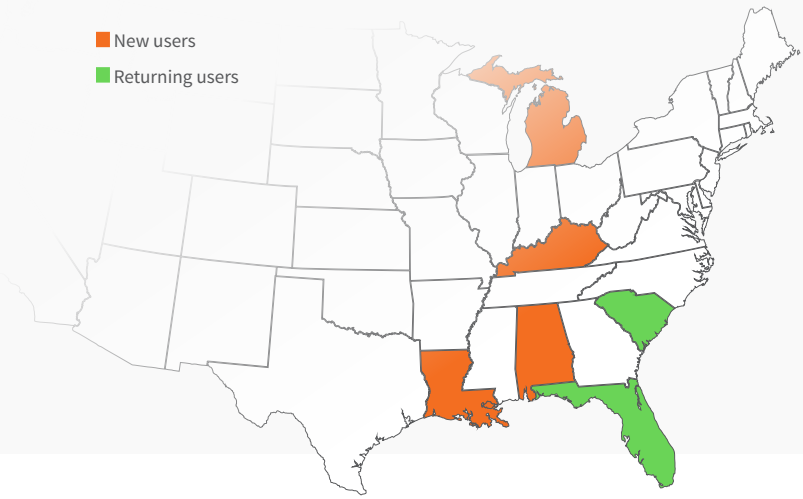
1. **A positive and playful learning environment:** Kide’s playful approach creates a fun and engaging atmosphere that supports learning and eases the stresses of a formal lesson.
2. **Shared meaning-making:** Kide lessons support teachers’ confidence to let go of control and use scaffolding. Instead of lecturing from the front of the class, teachers join the collaborative inquiry, which creates a much safer (and fun) learning environment for all.
3. **Practical resources:** Kide provides teachers tools for lesson planning management that make it easier for them to choose a lesson, identify supplies, and get started more quickly. Kide’s plans reduce teacher anxiety by emphasizing the process of inquiry rather than content knowledge.

MATH NATION

Meta-analysis

While previous research has highlighted the positive impact of Math Nation, we wished to understand its effectiveness more comprehensively. To do so, we conducted a meta-analysis, a method that combines results from multiple studies to provide a clearer picture of a curriculum's effectiveness. By combining all of the findings from the individual studies of Math Nation into one big analysis, we were able to draw larger conclusions. Pooling the results of many studies into a meta-analysis gives us a much larger amount of data to work with, making our conclusions more reliable and applicable to a broader audience. In our study, we combined all our efficacy studies of Math Nation during the 2022–2023 academic year to answer our biggest questions. This study includes multiple states, grades, and demographics.

Figure 1: Math Nation Increases Math Achievement



By analyzing data from the studies comprehensively, we can identify overall trends and determine how well a program works in different contexts. This helps us see the bigger picture and make more informed decisions about Math Nation.

The meta-analysis showed that Math Nation has a small but significant positive impact on student test performance even in the earliest stages of adoption ($z=2.28$, $p=.02$, $d=.10$). The program's effectiveness was consistent across different states and grade levels ($p>.05$), suggesting that it benefits all students regardless of location or grade. This study provides a comprehensive look at Math Nation's impact on student math performance. It is important to note that all but one included study were from states that were in their first year of using Math Nation. Even so, Math Nation had a small but significant positive impact on student test performance. The consistent impact across states and grades supports the curriculum's generalizability. We expect that Math Nation's impact will become stronger with continued use, as teachers and administrators become more confident in using the program. As data becomes available, ongoing evaluation will provide deeper insights into the influence of various factors on the curriculum's effectiveness.

2023–2024 Math Nation Kentucky Efficacy Study

This study examines how 10th-grade students in Kentucky in schools that used Math Nation performed on the state's Kentucky Summative Assessment (KSA) in math, compared to students in schools that used other math programs. We focused on the percentage of students who achieved the top "Distinguished" score. Additionally, we explored how effects varied among different groups of students, like those from economically disadvantaged backgrounds and those not needing additional support for English language learning. The main finding was that schools using Math Nation had a nearly 2% percentage point increase in students reaching the Distinguished level compared to non-Math Nation schools; this difference was statistically significant. Students from economically disadvantaged backgrounds in Math Nation schools showed small but encouraging gains in performance, with an increase in the number of students reaching Distinguished, although this difference was not statistically significant. Girls using Math Nation showed statistically significant improvement, with nearly 2% more achieving higher proficiency levels than their peers in non-Math Nation schools. Among students who did not require extra language support, significantly more in Math Nation schools (+1.52%) achieved Distinguished proficiency compared to non-ELL students in non-Math Nation schools. Finally, for Math Nation students without Individualized Education Plans (IEPs) there was a significant 1.38 percentage point increase in the number of students achieving Distinguished. These findings suggest that Math Nation may be beneficial in helping Kentucky students excel in math. Even though some differences were modest, the program's impact was positive across various groups, indicating that it could be a useful tool for improving math outcomes for a broad range of students. In terms of impact on equity, Math Nation seemed to offer benefits for students traditionally underrepresented in high achievement categories, like those from economically disadvantaged backgrounds. However, larger samples might be needed to confirm some of these trends with greater certainty.

Table 1: 2023–24 Math Nation Kentucky Efficacy Report

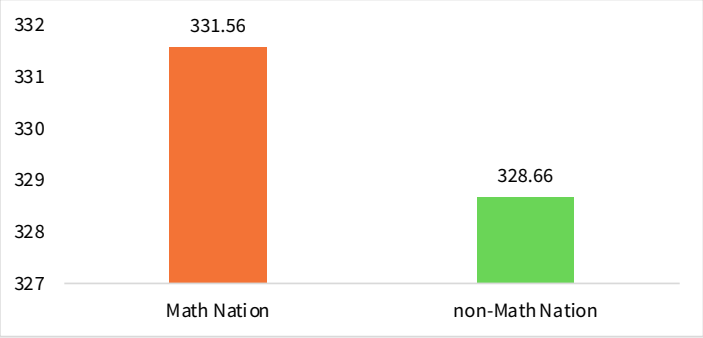
Demographic Group	Math Nation		Non-Math Nation		Mean Difference	Effect Size	ß	p-value
	N	Mean (SD)	N	Mean (SD)				
All 10th grade students	**61**	**10.97 (7.53)**	**61**	**9.54 (5.45)**	**1.43**	**0.22**	**0.01**	**0.05***
Economically Disadvantaged	52	7.06 (4.65)	52	6.25 (3.16)	0.81	0.20	0.01	0.18
Females	**54**	**10.91 (6.99)**	**54**	**9.0 (4.89)**	**1.91**	**0.32**	**0.02**	**0.01***
Hispanic/Latino Students	21	11.76 (8.61)	21	9.71 (5.87)	2.05	0.28	0.01	0.50
Males	62	11.84 (8.83)	62	10.34 (6.12)	1.50	0.20	0.01	0.23
Non Economically Disadvantaged	56	18.11 (10.49)	56	15.25 (8.19)	2.86	0.30	0.002	0.84
Non English Language Learners	**62**	**11.15 (7.69)**	**62**	**9.63 (6.25)**	**1.52**	**0.22**	**0.01**	**0.04***
Non Homeless	**61**	**11.10 (7.58)**	**61**	**9.56 (5.87)**	**1.54**	**0.23**	**0.01**	**0.02***
Non Migrant	**61**	**11.02 7.53)**	**61**	**9.66 (5.84)**	**1.36**	**0.20**	**0.01**	**0.05***
Students without IEP	**82**	**11.61 (7.60)**	**82**	**10.23 (5.76)**	**1.38**	**0.20**	**0.01**	**0.05***

*Statistically significant at the 0.05 level

2022–2023 Florida Math Nation Efficacy Study

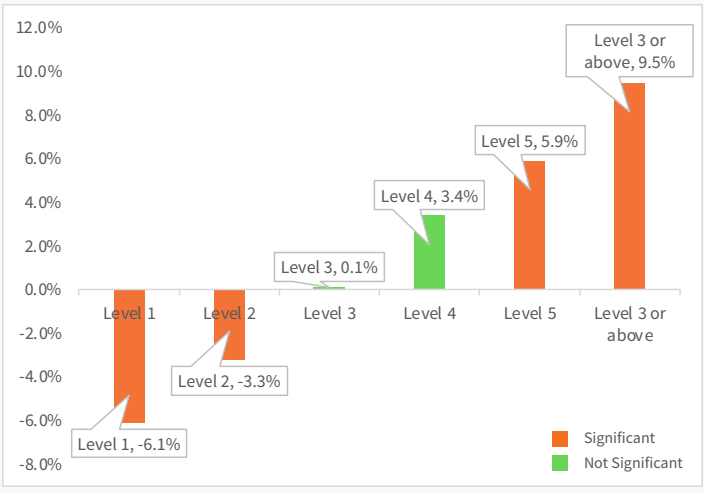
A recent study comparing the 2023 math Florida Assessment of Student Thinking (FAST) scores between schools using Math Nation and those not using it showed that Math Nation is associated with improved student scores in grades 6-8. Across combined grades, Math Nation schools scored an average of 331.56, a statistically significant increase of 2.9 points over non-Math Nation schools (average 328.66) and a 2.87-point improvement over the state average. Math Nation schools also had a 2.6% percentage point increase in students achieving the highest proficiency level.

Figure 2: Math Nation Improves Middle School Standardized Scores in Florida (average scale score for 6th-8th grade students at Math Nation schools versus non-Math Nation schools)



By grade, 7th graders experienced the strongest benefits. Math Nation schools had a 6-point average score increase (335.16 vs. 329.29 in non-Math Nation schools) and nearly 10% more students scoring at proficiency Level 3 or higher. The percentage of 7th grade students reaching Level 5 proficiency was 15.06% in Math Nation schools, compared to 9.16% in non-Math Nation schools and 6.63% statewide, representing a large effect size. In 6th grade, Math Nation schools had a 2.11 percentage point increase in Level 3 proficiency rates and a 2.78 percentage point increase in Level 4 proficiency rates compared to the state average. In 8th grade, while the main effect on scores was not significant, Math Nation schools had a notable 4 percentage point increase in students achieving Level 4 proficiency compared to the state average. These findings demonstrate consistent, positive impacts of Math Nation, particularly in raising high-level proficiency among students.

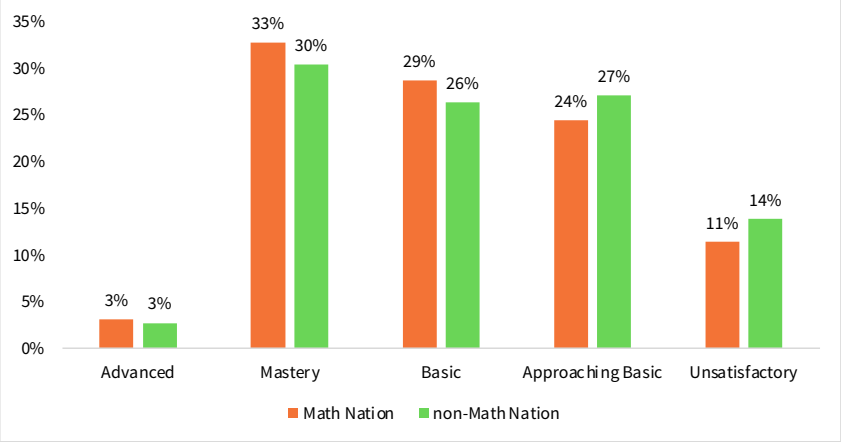
Figure 3: Math Nation has a Positive Impact on 7th Grade Math Scores in Florida (point difference in 7th grade students in Math Nation versus non-Math Nation schools)



2022–2023 Louisiana Efficacy Study

In October 2022, ALI launched Math Nation statewide for Louisiana. While the first year of the program requires significant recruiting and onboarding work, this study sought to understand the early impact of the program on the 2023 Algebra 1 Louisiana Educational Assessment Program (LEAP). We use a post-facto quasi-experimental design with a matched control group to evaluate preliminary associations between Math Nation usage and Algebra 1 LEAP math achievement for 8th and 9th graders in Louisiana. Math Nation schools outperformed the state average, with 28.65% of students scoring at the Basic proficiency level, compared to the state average of 25%, a statistically significant difference ($t(61)=3.27$, $p=.002$, $d=.42$). Math Nation schools also showed a significant reduction in the percentage of students at the Unsatisfactory level (11.37% vs. 12% state average), with this difference also reaching statistical significance ($t(61)=10.10$, $p < .001$, $d=.01$). Although the differences did not reach statistical significance, Math Nation schools demonstrated numerically higher percentages of students at Advanced, Mastery, and Basic levels and lower percentages at Approaching Basic and Unsatisfactory levels relative to non-Math Nation schools. The use of the "Test Yourself!" tool further highlighted an increase in students scoring at the Basic level (30.14% vs. 25% state average, $t(13)=2.70$, $p=.02$, $d=.72$), underscoring the tool's potential effectiveness.

Figure 4: Math Nation Shows Promise for Increasing Math Outcomes in Louisiana (% difference for Math Nation vs. non-Math Nation schools)



2022–2023 South Carolina Efficacy Study

Math Nation partnered with Clemson University to conduct an efficacy study of Math Nation in South Carolina. The study explores the impact of Math Nation on 2022–2023 Algebra End-of-Course (EOC) performance in 146 high schools. We used structural equation modeling regression analysis to compare Algebra EOC scores in Math Nation and non-Math Nation schools. The main finding is that Math Nation schools had a significantly higher percentage of students scoring at a Level C or higher on the Algebra EOC (34.98%) compared to non-Math Nation schools (30.52%). Math Nation schools also had significantly higher percentages of Black/African American, White, and students in poverty scoring at Level C compared to non-Math Nation schools. Overall, the most noticeable differences between Math Nation and non-Math Nation schools are observed at Levels C and F. Please see the figures that illustrate these differences visually, showing significant distinctions in percentages of students scoring at Levels C and F.

Figure 5: Math Nation Increases Student C Level Math Outcomes in South Carolina (% of students scoring at a C level in Math Nation versus non-Math Nation schools)

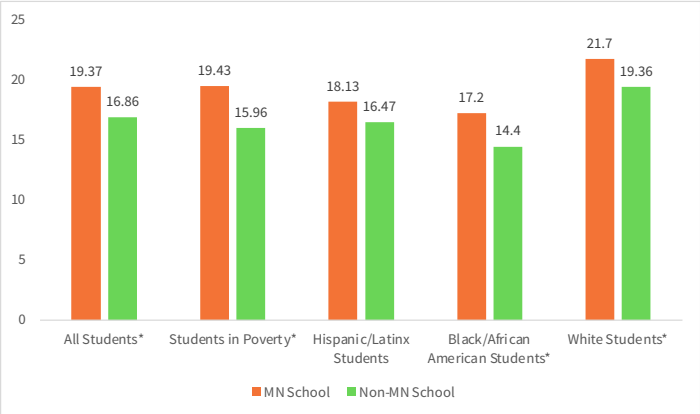
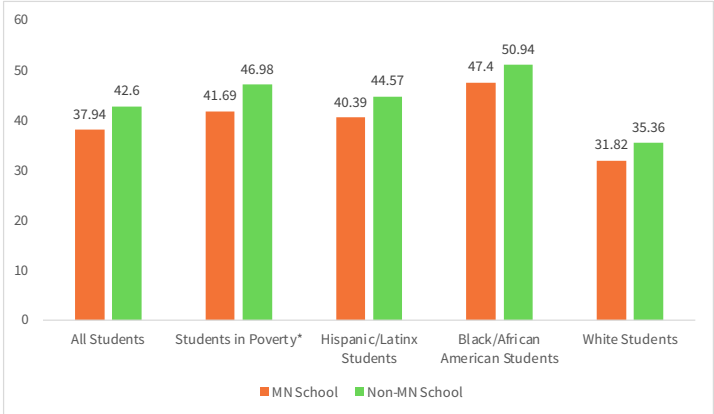


Figure 6: Math Nation Increases Student F Level Math Outcomes in South Carolina (% of students scoring at an F level in Math Nation versus non-Math Nation schools)



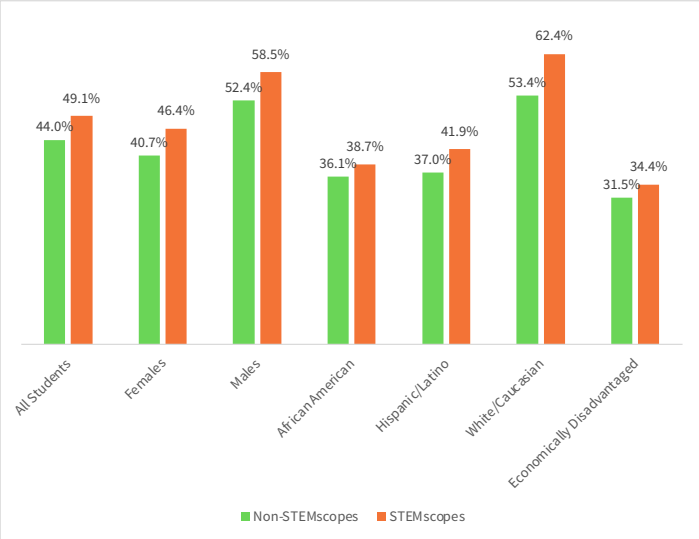
(*indicates a significant difference)

STEMSCOPES MATH

2023–2024 Tennessee Efficacy Study

ALI conducted an efficacy study focused on STEMscopes Math usage in Tennessee across the 2023–2024 school year. Results indicated that schools that used STEMscopes Math in 4th grade had significantly higher passing rates on the 2024 Tennessee Ready Math test compared to 2023. Specifically, the passing rates increased 14.76 percentage points, from 34.11% to 48.87% on average, with significant increases across all student groups as well. We also tested if STEMscopes Math schools had higher 2024 4th grade passing rates relative to matched non-STEMscopes schools. This was also the case: STEMscopes Math schools had a significant 5.10 percentage point higher estimated mean passing rate among all students (49.09%) relative to matched non-STEMscopes schools (43.99%). STEMscopes Math schools also had higher 2024 passing rates relative to non-STEMscopes schools in all student groups, with significant findings among males, females, White/Caucasian, and African American/Black students.

Figure 7: STEMscopes Math Increases 4th Grade Math Passing Rates in Tennessee



(% of students who pass in STEMscopes versus non-STEMscopes schools)

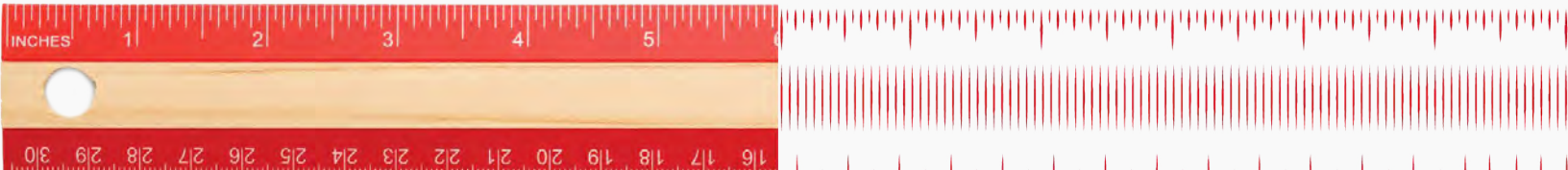
2023–2024 Texas Middle School Efficacy Study

ALI conducted an efficacy study focused on middle school STEMscopes Math usage across the 2023–2024 school year. Results were positive across grades, with larger and significant impacts more common in 7th and 8th grade.

> For both 7th and 8th grade there was a significant increase in schools' average scale scores on the Texas' STAAR compared to matched non-STEMscopes schools.

This, in turn, was associated with significantly higher "meets grade level expectations and above" school passing rates for 7th grade. In 7th and 8th grade, low-income students in STEMscopes Math schools had higher average scale scores compared to peers in non-STEMscopes Math schools. This, in turn, was associated with significantly higher meets grade level or above percent passing rates. We also saw significantly higher average scale scores and passing rates for 7th grade White/Caucasian students and 7th grade males. We saw significantly higher average scale scores for 8th grade males and females too, but not significantly higher passing rates. We saw significantly higher passing rates for 6th grade English Language Learners (ELLs), 7th grade females, and 7th grade Hispanic/Latinx students, but not higher scale scores.

Finally, we saw significantly higher average scales scores and passing rates for African American/Black students in 8th grade. These results provide some evidence that different grades and different student groups may benefit more from the STEMscopes Math program than other grades and groups. We further confirmed these findings in 6th grade, where English Language Learners in STEMscopes Math schools had higher passing rates than not just their peers in non-Math schools, but also relative to non-ELLs, resulting in an accentuated effect of STEMscopes Math for this group. Likewise, in 8th grade African American/Black and Hispanic/Latinx students also had a significantly more accentuated increase in passing rates relative to their peers in non-STEMscopes Math schools and to White/Caucasian students. This offers some evidence that STEMscopes Math may be particularly helpful for students who are not always served well under other curricular models.



STEMSCOPES SCIENCE

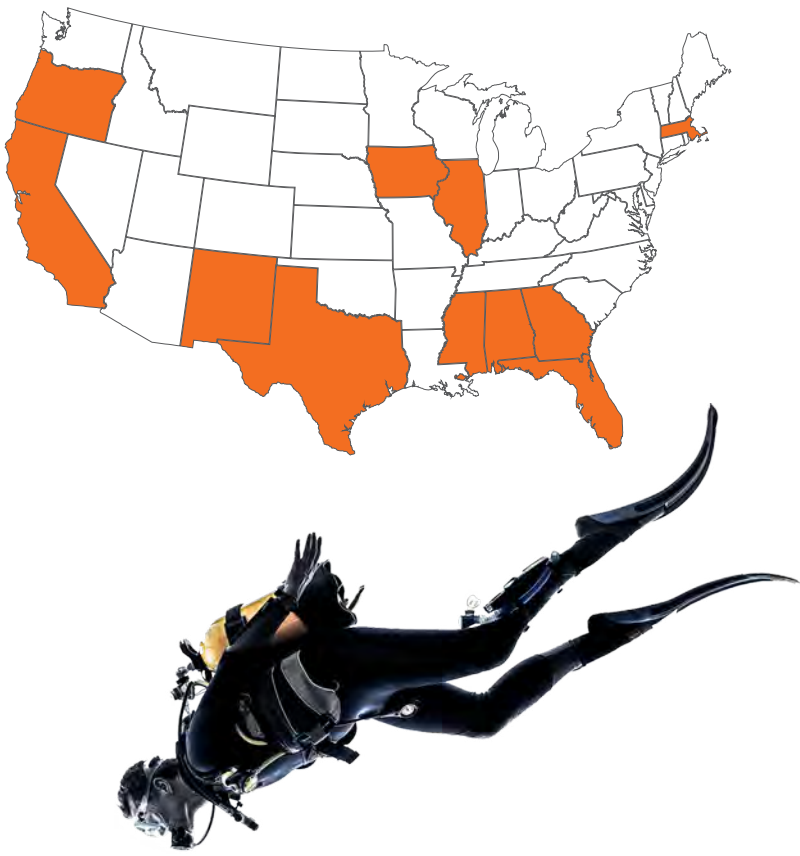
Meta-analysis

Like the Math Nation meta-analysis above, ALI needed a way to understand the comprehensive impact of STEMscopes Science across different tests, grades, and states throughout the nation. We used a meta-analysis to evaluate the impact of STEMscopes Science on student science test performance across three school years (2020-2023) across multiple states and grades. By analyzing data from the studies comprehensively, we can identify big picture trends and determine how well a program works across the nation.

> The meta-analysis showed that STEMscopes Science has a medium but significant positive impact on student test performance, even in the earliest stages of adoption ($z=5.22$, $p < .001$, $d=.18$).

These results indicate that STEMscopes Science has a medium and meaningful impact on student science achievement, as indexed by their school-wide passing rates. The significant effect is especially meaningful when considering that these studies were conducted over many different types of schools and school contexts across the four corners of the US. Overall, the results of the STEMscopes meta-analysis provide confidence that STEMscopes Science is having a positive impact at a national scale.

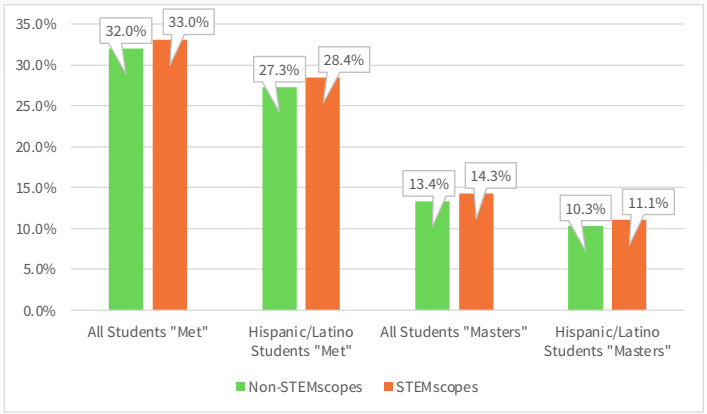
Figure 8: US States Where STEMscopes Science Increases Science Achievement



2022–2023 Texas Efficacy Study

ALI conducted an efficacy study with Texas schools that used STEMscopes Science for 5th grade and matched non-STEMscopes schools. There was a significant 1.04-point increase in the percentage of students who met STAAR grade expectations in STEMscopes Science (passing rate: 33.04%) versus non-STEMscopes Science schools (32.00%). There was a 0.91 significant, positive difference in the percent of students who "mastered" grade level expectations in STEMscopes Science (rate: 14.26%) versus non-STEMscopes Science schools (13.35%). For both categories (Met and Mastered), there was a significant point increase in the percent of Hispanic/Latinx students in STEMscopes schools that met (28.44% versus 27.27%) and mastered (11.06% versus 10.32%) grade level expectations on the STAAR compared to their peers in non-STEMscopes schools. Numbers are small, but represent at least 976 more students who Met, and 851 more students who Mastered grade level on the STAAR. This was the first year of the STAAR redesign.

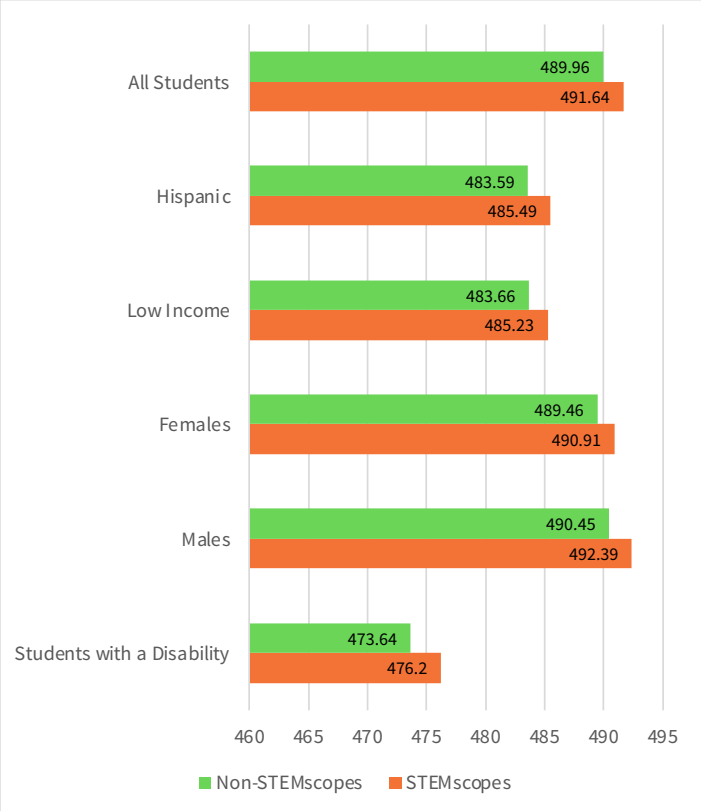
Figure 9: STEMscopes Science Increases Science Passing Rates in Texas (% of 5th graders that "met or mastered" STAAR grade level expectations in STEMscopes Science versus non-STEMscopes Science Texas schools)



2022–2023 Massachusetts Efficacy Study

ALI conducted an efficacy study of schools that used STEMscopes Science compared to schools that did not use STEMscopes Science. Massachusetts schools that used STEMscopes Science for 5th grade were matched to non-STEMscopes schools that used other curricular resources to examine the impact of the STEMscopes 5th grade Science curriculum on the 2023 5th grade Next Generation Massachusetts Comprehensive Assessment System (MCAS). The study found that STEMscopes increased school passing rates from 34.7 to 36.8% and significantly increased school average scale scores on the MCAS Science test as well as schools, average percentile ranks relative to non-STEMscopes schools (from 40th on average to 44th). Among student groups, STEMscopes also had an impact on average MCAS Science scale scores. In fact, all sub-groups tested, including Hispanic/Latinx students, students with low family incomes, females, males, and students with disabilities, demonstrated a positive impact. Notably, students with disabilities in STEMscopes scored 2.5 points higher on average than their peers in non-STEMscopes schools.

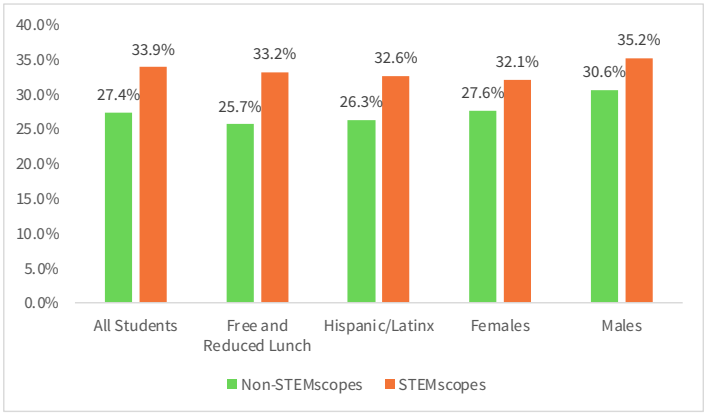
Figure 10: STEMscopes Science Increases Science Average Scales Scores in Massachusetts



2022–2023 New Mexico Efficacy Study

ALI conducted an efficacy study that examined the impact of STEMscopes Science usage in grade 5 on school passing rates on the New Mexico Science Assessment of Science Readiness (NM-ASR) during the 2022–2023 school year. Schools that used STEMscopes Science showed a sizeable, statistically significant increase in performance on the NM-ASR compared to matched control schools. Overall, STEMscopes Science schools had an average increase of 6.5 percentage points. The average passing rate for non-STEMscopes schools was 27.4%. The average passing rate for STEMscopes was 33.90%; this represents a 23.7% increase and translates to approximately 204 more New Mexican students passing the NM-ASR in 2022–2023 in STEMscopes districts. Results also indicated sizable school passing rate effects among student sub-populations, including students eligible for free and reduced lunch as well as Hispanic/Latinx students.

Figure 11: STEMscopes Science Increases Science Passing Rates In New Mexico (NM-ASR 5th grade)



Product Use Studies

Product use studies refer to smaller scale studies that ask qualitative and quantitative research questions but often without the rigor of a control group. They are "process" studies that help us gather research about a variety of program outcomes (e.g., what is working and what needs improvement) before we conduct a study that compares these outcomes directly to groups of non-users. In traditional research these are sometimes called pilot studies or "promising studies," to use language borrowed from ESSA.

KIDE SCIENCE

Kide Science was acknowledged for meeting the educational impact criteria of the Every Student Succeeds Act (ESSA), warranting a Level 4 for "Demonstrating a Rationale" by the LXD Research group. This recognition is based on its research-based design, intended to enhance learning outcomes. The external evaluation found that the Kide Science solution was developed based on extensive research by its founder, Dr Vartiainen. It was piloted on a small scale and later used as a teaching approach in kindergartens and pre-primary schools in Finland. Over time, it was developed into an online solution. There are several published peer-reviewed studies using observational data and qualitative analysis that test the scientific pedagogical assumptions, yielding positive results.

MATH NATION

Hillsborough County School District

This study integrated findings from surveys and interviews conducted across the 2023–2024 academic year to evaluate the platform's usability, engagement, and effectiveness in Hillsborough County Public Schools in Florida. Early surveys showed that all five participating teachers used Math Nation to supplement instruction, with varied levels of integration and moderate student engagement. Teachers highlighted a reliance on laptops and diverse classroom structures. Student feedback at this stage indicated mixed enjoyment and interest. Mid-year interviews revealed generally positive experiences with platform usability, especially navigation, though teachers recommended simplifying certain features. The "Test Yourself!" and Study Expert videos were identified as highly effective in engaging students, despite some students finding the platform challenging. Limited time and familiarity led to underutilization of some resources, especially digital tools. End-of-year surveys, with feedback from six teachers, demonstrated increased usage and reliance on Math Nation for formative assessments and curriculum supplementation.

> Teachers reported notable improvements in student interest, confidence, and learning outcomes, crediting engaging features like "Test Yourself!" and Study Expert videos.

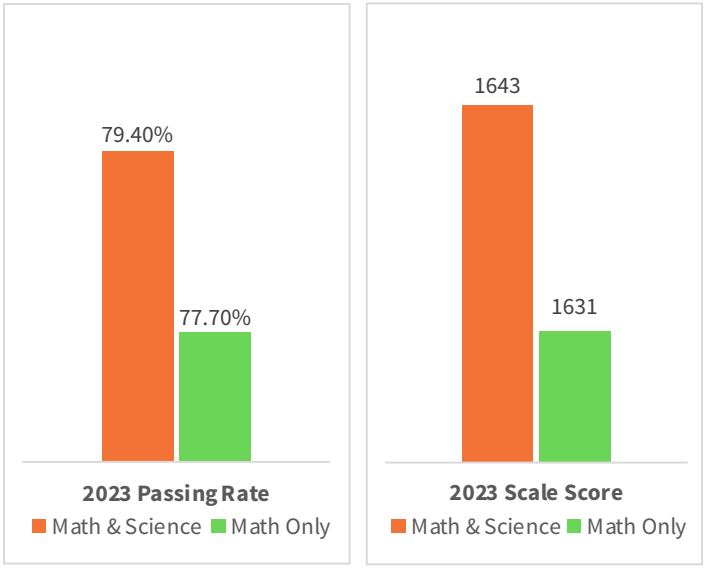
They also valued the platform's role in preparing students for exams but suggested enhancements in user interface, content variety, and professional development opportunities. Overall, teachers praised Math Nation's comprehensive resources and its ability to foster student interest and learning in math. To optimize its impact, recommendations include streamlining navigation, expanding adaptive content, offering targeted training, and establishing mechanisms for ongoing teacher feedback. These insights underscore Math Nation's strengths while identifying areas for improvement to enhance its role in mathematics education within the district.

STEMSCOPES MATH

Texas Math Study with LXD Research & WiKIT

In collaboration with LXD Research and WiKIT, ALI was awarded up to $50,000 matched dollars from the Jacobs Foundation. As part of this work, LXD conducted a retrospective study comparing schools in Texas that use both STEMscopes Math and Science curricula to those that use only STEMscopes Math. The analysis used spring 2023 STAAR (State of Texas Assessments of Academic Readiness) Math outcomes for 5th graders as the primary performance measure, with baseline data from spring 2022 (4th grade performance) to maintain consistency within student cohorts, focusing on performance differences between the two groups of schools. Schools using both STEMscopes Math and Science curricula had higher 2023 passing rates and higher average scale scores on STAAR Math compared to schools with "only STEMscopes Math," after accounting for demographics and baseline scores. Teachers in schools with both indicated intensive use of the curriculum. Economically disadvantaged students in schools with both curricula also had higher spring 2023 passing rates (75.5%) than their counterparts in Math only schools (73%), after controlling for baseline rates.

Figure 12: Using Both STEMscopes Curricula Boosts Student Math Outcomes (Spring 2023 STAAR Mathematics Outcomes)



Passing Rate: p<.01, Cohen's d effect size=.21
Scale Score: p<.001, Cohen's d effect size=.34
Economically Disadvantaged: p<.05, partial eta effect size=.01

STEMSCOPES SCIENCE

Mixed Methods Equity Study

ALI partnered with Texas Tech University to explore the experiences and perceptions of Texas science teachers utilizing STEMscopes Science. The study focused on how STEMscopes influences teachers' content knowledge, pedagogical knowledge, and pedagogical content knowledge. Additionally, it investigated the extent to which STEMscopes supports teachers in implementing a constructivist pedagogical approach to address equity issues in their classrooms. Participants included 327 Texas science teachers who are users of the STEMscopes curriculum who initially responded to the online survey, representing a diverse range of school settings and demographics. Follow-up interviews have so far been conducted with 23 teachers. The results were examined for overall patterns in how teachers utilize and implement the curriculum in their classrooms and, more importantly, their attitudes toward the impact of using the curriculum on their content and pedagogical knowledge and their ability to promote equity in their classroom.

While most teachers identify the development of student science content knowledge and process skills as the primary benefits of using a constructivist curriculum like STEMscopes, they acknowledge the enhancement of their own content and pedagogical knowledge as additional benefits.

> More than 72% of respondents agreed or strongly agreed that their use of STEMscopes increases their own science knowledge. Over 80% agreed or strongly agreed that their use of STEMscopes makes them a better science teacher.
>
> Over 70% agreed or strongly agreed that their use of STEMscopes increases their ability to promote equity in their science classroom.

In a free response question, teachers provided examples of equity practices they used in implementing STEMscopes. About one-quarter of the responses to this prompt described teachers' ability to engage in individualized instruction for personal learning. Sixteen percent of the comments related to reaching students at the extremes of ability. Future analyses are planned to evaluate focus group responses.

NISE

Nevada Designated STEM School Network STEM Teacher Certificate Pilot

In 2022, the Nevada Governor's Office of Science, Innovation and Technology (OSIT) invited teams of teachers and administrators from Nevada Governor Designated STEM Schools to apply for a pilot program that sought to identify the impact of the National Institute for STEM Education's (NISE) National Certificate for STEM Teaching (NCST) program on the school's STEM instruction as well as the school's overall rating on the Classroom Category of the Nevada STEM Framework. STEM Schools have regularly communicated to OSIT the desire to 1) Engage more teachers at their schools in STEM, 2) Continue staff STEM professional learning, and 3) Advance their school to a higher tier of the Governor STEM School Designation, although OSIT notes that many Developing STEM Schools require a significant shift to student-led learning to move to "Established" or "Model" Classroom category designations. To respond to STEM schools' needs, OSIT and NISE collaborated to develop and facilitate a year-long pilot to evaluate the NCST program's impact on the Designation program. Together, OSIT and NISE developed a cross-walk of the NCST indicators and the attributes described in the Nevada STEM Framework. The cross-walk evidenced a near-perfect alignment of the two programs.

OSIT accepted 35 educators from six schools, representing a variety of grade levels, years designated, and geographic locations. Schools were rated at the Developing designation level at the time of acceptance. Participants completed extensive pre- and post-surveys about their instruction, confidence, and experience with STEM. School cohorts met throughout the year to progress through the program together. NCST coaches supported participants through meaningful feedback on their course work. School cohorts attended quarterly workshops led by OSIT and NISE, which helped participants make connections between the NCST and the Nevada STEM Framework attributes. OSIT funded participants' enrollment in the NCST program, as well as a $5,000 stipend per educator. Results indicated that educator confidence in teaching STEM increased.

> For example, prior to the program, only 4% of teachers agreed or strongly agreed that "I know instructional strategies necessary to teach STEM effectively." After the program, 94.3% agreed/strongly agreed. When prompted "I understand STEM concepts well enough to be effective in integrating STEM into my teaching," only 8% agreed/strongly agreed before NCST, but 91.4% agreed/strongly agreed after the program.

Educators also demonstrated more high-quality STEM instructional practices after the pilot. Before the pilot, educators often told students how their learning applied to real-world situations. After, educators allowed them to define real-world problems and find meaningful solutions. Before the pilot, engineering was absent from most classrooms. After, educators helped students engage in the engineering design process as a fluid, authentic problem-solving strategy. Teachers also made gains in the way they approached science. For example, when provided an example STEM lesson and asked how to improve it, the "before pilot responses" included general strategies appropriate for any subject area (hands-on, collaborative, student-centered). However, the "after pilot responses" were more specific to STEM, including technology integration, authentic contexts, and asking questions and making observations.

Case Studies

A case study is an in-depth analysis of an individual or small group. In our case, it typically focuses on the successful use of a product in one school and includes administrative and teacher interviews as well as descriptive numbers that help the reader understand the school context and the products' use in the school better. ALI's public relations team helped the research team gather case studies.

KIDE SCIENCE

Forsyth County Schools, Georgia

Forsyth County Schools (FCS) is the fifth largest district in Georgia and serves more than 55,300 students representing 129 countries and 69 languages (14% Hispanic, 5% Black/African American, 44% White). In 2023, FCS Associate Superintendent of Teaching and Learning Lee Anne Rice attended a superintendents' conference with a goal to find new literacy programs and assessments. It was there she found Kide Science, an early childhood STEM program that combines storytelling, imaginative play, and hands-on learning.

"Our state was talking about new legislation to increase early literacy, so I was looking for programs to boost literacy achievement and growth," said Rice. "When I saw Kide Science, I was intrigued. It supports literacy but through the lens of scientific practices and principles—and that connects directly to our district's Learner Profile and our 2022–2027 Strategic Plan."

FCS piloted Kide Science in 10 of its 23 elementary schools in May 2023. "It was amazing how many teachers wanted to try it," she said. "It was the last month of school, and that's usually when we see an increase in negative student behaviors. But when students were doing the Kide Science lessons, our kindergarten teachers said they saw very few discipline issues. They talked about how much fun their students had and how engaged they were."

At the end of the pilot, FCS decided to implement Kide Science as a supplemental resource in all kindergarten classrooms in 2023–2024.

"Now all of our kindergarten teachers are utilizing Kide Science, and they absolutely love it," said Rice. Kide Science is helping schools meet two key objectives for the learner experience—to increase student achievement and growth, and to increase student engagement—in the district's five-year strategic plan. "We're a high-performing district, and our parents and community have high expectations. With the drive for academic achievement and accountability, we can sometimes lose sight of the power of play. Kide Science provides a way to enhance students' academic knowledge through imaginative play. It also helps us support our standards, including speaking and listening standards that are sometimes hard to quantify," said Rice.

STEMSCOPES SCIENCE

Las Cruces Public Schools, New Mexico

Las Cruces Public Schools (LCPS) is located 45 miles north of the US-Mexico border. With 23,000+ students, it is the second-largest district in New Mexico (78.1% Hispanic, 1.9% Black/African American, 17.1% White). When New Mexico adopted new science standards in 2018, LCPS set out to find a new elementary science curriculum. The district formed a Textbook/Instructional Material Review Team that evaluated all materials. The team then sent its top choices for review in the schools. After tabulating all the results, one curriculum met LCPS's needs: STEMscopes Science. According to Associate Director of Teaching and Learning for K-12 Science Stephanie Hofacket, PhD, STEMscopes Science does a number of things well to support science learning in LCPS's elementary classrooms.

> "It provides an instructional resource that aligns to the Next Generation Science Standards (NGSS)," she said. "It uses the 5E inquiry-based framework, bases lessons on phenomena, and supports culturally and linguistically relevant teaching practices for science education. The accessibility tools, diversity in language acquisition strategies, ease of accessing the English and Spanish versions, and consistency across grade levels have been a huge benefit not only for our students, but also in providing the support for teachers to meet the needs of all students."

LCPS began using STEMscopes Science in 2019 in grades K-5. Then, in early 2020, things took an unexpected turn when the COVID-19 pandemic struck. LCPS closed its schools, and students learned remotely for nearly two years. During that time, teachers continued to provide high-quality science instruction with STEMscopes Science, and LCPS supported its teachers and students every step of the way. "We began by collaborating with a team of grade-level teachers to devise the structures for remote learning," said Hofacket. "We continued on with their ideas and plans, and created modules on our learning management system. The Canvas LMS modules followed the 5E structure, but the Explore component was modified to have activities that only required items found around the house for students to utilize, and most assignments were assigned digitally to students via the STEMscopes platform." In addition, the district's elementary science content specialist worked one-on-one with teachers who requested support and held four online professional development sessions each week as well as office hours for support. "Our team was responsive to all needs with immediate action," said Hofacket.

After the disruptions of the pandemic and the introduction of a new statewide science assessment, LCPS's school passing rates in grade 5 confirmed the positive trends teachers are seeing in the classroom. Relative to the state, LCPS is staying one step ahead, with numerically higher passing rates—approximately 1 percentage point higher each year—on both the 2022 and 2023 NM-ASR assessments. Since LCPS is one of the largest, most diverse urban districts in New Mexico, an additional study was conducted to examine the impact more closely. In this analysis, the 22 Las Cruces elementary schools that included 5th grade were matched to schools in two other similar urban districts. Results from the 2023 NM-ASR showed that Las Cruces schools, on average, had scored 8.2 percentage points higher relative to other similar urban New Mexico elementary schools. That represents a 31% difference in scores on the 2023 NM-ASR compared to similar schools that did not have STEMscopes Science.

LEAD Neely's Bend Middle School, Tennessee

When Malorie Moose became the director of science for LEAD Public Schools in 2022, she quickly realized the existing science curriculum had significant gaps.

"The program wasn't aligned with our state standards, so everyone was making up their own lessons based on their interpretation of the standards," said Moose.

The Nashville-based LEAD charter school network, which operates five schools in grades 5-12, also faced another challenge: Most students come to LEAD two to three years behind grade level. Without a comprehensive science curriculum, it was difficult for teachers to provide the support needed to help students catch up.

> "We wanted a curriculum that would align to the standards and get students doing science," said Moose. After careful evaluation by leaders and a panel of teachers, LEAD adopted STEMscopes Science Tennessee. "STEMscopes Science helps us ensure we're teaching the right content and hitting the level of rigor needed to set our students up for success on our state assessment," said Kara Roberts, the instructional manager of science and social studies at Neely's Bend. "STEMscopes has changed the way we approach science. It encourages our students to think like scientists and investigate as a scientist would," said Moose.

From 2023 to 2024, LEAD schools saw significant improvement on TCAP Science scores. In 2023, 18.79% of students met or exceeded grade-level expectations. In 2024, this number rose to 22.25%. This means that nearly 20% more students met or exceeded grade-level expectations in 2024 with STEMscopes Science. At Neely's Bend, where teachers used STEMscopes daily, the increase was even larger. From 2023 to 2024, the percentage of students who met or exceeded grade-level expectations on the TCAP jumped from 13.6% to 20.2%.

"STEMscopes definitely helped contribute to these gains because of the alignment to the Tennessee state standards and the level of rigor," said Roberts.

Kauluwela Elementary, Hawai'i

Kauluwela Elementary is a Title I school in downtown Honolulu near Chinatown and serves preschool through 5th grade (11% Hispanic, 1% Black/African American, 53% Native Hawaiian or other Pacific Islander)*. In 2021, when Sonja Samsonas became principal, she found that little time was being devoted to science. "When I did classroom visits, I rarely saw science being taught," she said. "There was this idea that because we had a STEM teacher, then that took care of science, but that is far from what the expectations are." The NGSS were adopted in Hawai'i in 2016 and were expected to be fully implemented by the 2019–20 school year. While Samsonas was conducting classroom visits, she discovered that a previous administrator had purchased STEMscopes Science NGSS 3D in 2019 but that it hadn't been implemented.

> "When I saw this, I asked, 'Why don't our teachers just use STEMscopes? It has everything they need."

To improve science instruction, Samsonas arranged to have the district deliver professional development to acquaint teachers with the NGSS. Then she established schoolwide expectations.

Teachers rose to meet expectations, and after only one year, the school's proficiency rate on the Hawai'i Statewide Assessments (HSA) Grade 5 Science (NGSS) Test jumped from 23% to 30%. "I think the increase happened for two main reasons," said Kauluwela Elementary's implementation and Title I/ESSER Coordinator. "One, with STEMscopes, we now have a science curriculum that is strongly connected to the standards, and it is being implemented with fidelity schoolwide. Two, the Claim-Evidence-Reasoning assessments in STEMscopes have helped improve students' critical thinking and writing skills, which is in line with what's expected on the state test. Providing teachers with the STEMscopes curriculum and PD has been very impactful," she said. "The culture of science here has changed, and we hope that that will continue to be reflected in our results."

** Only the 3 largest ethnic groups listed for brevity purposes*

Appoquinimink School District, Delaware

Appoquinimink School District in Middletown-Odessa-Townsend, Delaware first adopted STEMscopes NGSS in 2018 in 21 schools serving 13,000+ K–12 students (8% Hispanic, 29% Black/African American, 49% White). “We liked several things about STEMscopes,” said Todd Dunn, district science and Title 1 coordinator for ASD. “Alignment to the NGSS was key. Cost was a priority. We also liked that STEMscopes had both print and digital materials since we were becoming a 1:1 district and having the materials available in Spanish was a huge plus.” The curriculum provides teachers with everything they need to address the Disciplinary Core Ideas, Crosscutting Concepts, and Science and Engineering Practices that form each standard of the NGSS. STEMscopes also includes embedded support for teachers such as lesson plans, professional development videos, on-demand webinars, and how-to guides that help them continuously improve their teaching. ASD teachers also appreciate that they can engage in just-in-time professional learning. “When we adopted STEMscopes, we began shifting away from the old professional learning mindset that we had embraced for decades,” he said. The vertical alignment in STEMscopes also makes it easier for ASD elementary teachers to develop student expectations from kindergarten through fifth grade. “At the elementary level, many of our teachers are new, and many get reassigned to a new grade level each year,” said Dunn.

“When the new state test was first administered in 2019, that was the first full year we implemented STEMscopes, and our proficiency rate was almost twice the state average,” said Dunn. “Most of our elementary schools are in the top 10 or 15 in science in the state, and we even have a few in the top five. To my knowledge, we’re the only ones using STEMscopes, so that tells us something. I feel very fortunate that my district leadership supported me in making the change. It was a big jump, but it’s paid off, and we’ve seen the rewards with our students.” Scores have continued to remain ~20 points higher than the rest of the state across the intervening years. Student behavior has improved in science classes as well. “When kids are engaged in what they’re doing, classroom management naturally follows. The better the classroom environment, the more learning you have.” Looking toward the future, Dunn would like to continue to find ways to prioritize science at the elementary level. “I’m happy with our results, but there’s always room for growth.”

NISE

Des Moines Christian School, Iowa

Des Moines Christian School in Urbandale, Iowa serves preschool -12th grade students (1% Hispanic, 2.2% Black/African American, 92.1% White). In 2021, they launched a dedicated K-5 STEAM classroom, and asked long time sub, first time STEAM teach Liz Sisler to run it. “When the principal approached me, I didn’t have any formal training in STEAM,” she said. “But I like a challenge, and the idea of getting to do hands-on learning with kids was exciting.” Students attend the STEAM classroom as a special once every four days. At the end of the first year, she talked with the principal about seeking further education. “I wanted to grow in my knowledge, but I wasn’t ready to do a master’s in STEAM education or something that would take me away from home because I’m a mom, too,” she said. “I wanted something that would be manageable and help me learn without feeling overwhelmed.” Sisler found the National Institute for STEM Education (NISE) and the Micro Certificate program that leads to a STEM Essentials Certificate.

From 2022 to 2024, Sisler completed two Micro Certificates. “Understanding that project-based learning isn’t just group projects was really helpful,” she said. “Project-based learning is helping my students develop skills that will help them succeed in every subject in school and in life. And they have so much fun that they don’t even realize how much they’re learning” The “Argumentation” and “Claim-Evidence-Reasoning” courses, which are part of the Scientific Argumentation Micro Certificate, helped Sisler learn protocols and develop tools to help her students express their opinions, make decisions, and tackle problems in class and in daily life. In June of 2024, Sisler took the “Reading in STEM” and “Writing in STEM” courses and earned a Micro Certificate in Scientific Literacy — completing her STEM Essentials Certificate. “As a STEAM teacher, I hadn’t really thought about my role in reading and writing. The NISE courses showed me how to incorporate these skills into my lessons in a natural way,” she said. “This will help students see that there isn’t one box of skills for math class, one for science class, and one for reading and writing. These are all skills of everyday living, and they’re all necessary and relevant to their lives.” Next, Sisler wants to explore other NISE courses to see how she can deepen her knowledge and expand her skills. “Earning the STEM Essentials Certificate has been a very positive experience for me,” she said. “I definitely see the value of continuing to learn and grow. The more I understand, the better teacher I can be.”

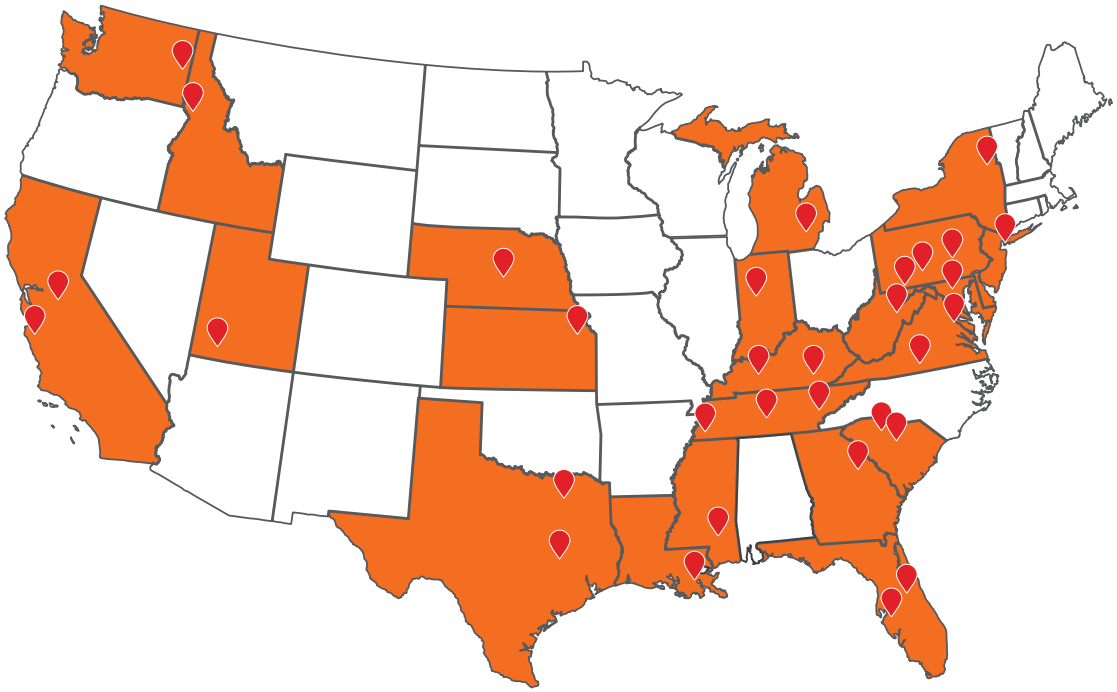
Customer Advisory Board

Some of the most important research activities we conduct are those that ensure teachers and school experts are being heard regarding our products. Research in this category tends to be “descriptive,” meaning we are describing and listening to the opinions of our users to make sure we give them exactly what they want and need. Early in 2024 we launched year 2 of the Customer Advisory Board (CAB). We designed our CAB to be a representative group of users and STEM education experts that would meet once per year face-to-face and twice remotely. This year, Hurricane Beryl canceled our in-person meeting, but members still provided excellent feedback through a spring remote focus group and fall focus groups and/or surveys (depending on ALI product).

Overall, the CAB participants provided excellent feedback across ALI products and even engaged in deeper research relationships in the case of Kide Science. For example, STEMscopes Science participants provided page by page feedback on potential teacher guides, print options available, and visual support within the STEMscopes Science platform. STEMscopes Math participants gave feedback on elements of the platform that they like and what they would like to change. Much of the discussion was around ease of using the system and not needing to pull elements out and “build for yourself” outside of the platform. For Kide, participants created journals focused on using the Kide product. This data will hopefully contribute to a case study report for a peer reviewed journal! Results are still coming in for the Math Nation fall survey.

The map below shows the national reach of our 2024 CAB program. We are grateful for the invaluable input from our CAB team this year across the nation.

Our Team: Coast to Coast



Customer Surveys

MATH NATION

Alabama Teacher Survey

ALI partnered with WestEd, a nonprofit education research organization, to create and implement a teacher survey in the spring of 2023. The final analytic sample included 169 teachers. Teachers generally had positive perceptions of student engagement, motivation, and outcomes when using Math Nation. Teachers' usage increased over the school year, with greater increase in classroom instruction than for homework or extending learning beyond the classroom. Perceived usefulness of aspects of the Math Nation platform and teacher workbook varied by feature but was generally positive. Every feature of the platform was rated somewhat or very useful by at least 80% of all teachers who used it, except for the Student Wall (72.9%). Similarly, all features of the teacher workbook were rated somewhat or very useful by at least 89% of the teachers who used them. A notably high percentage of all teachers who responded to the survey (94%), regardless of their number of logins, indicated that they were likely or very likely to recommend that their school or district use Math Nation in the future.

Louisiana Teacher Survey

ALI partnered with WestEd to create and implement a teacher survey in the spring of 2023. The final sample included 89 teachers. Teachers generally had positive perceptions of Math Nation, with responses across multiple items demonstrating a prominent belief in the potential for Math Nation to positively impact a variety of student outcomes, ranging from engagement to mathematical learning. Teachers' usage of most features increased over the course of the school year with greater increases in use of Math Nation for classroom instruction than for homework or extending learning beyond the classroom. Perceived usefulness of aspects of the Math Nation platform and teacher workbook was generally positive, but usage varied by feature. Platform features such as EdgeXL, OnRamp to Algebra 1, Math in Action, Bootcamp, Student Wall, and Teacher Wall were used less and received fewer ratings as very useful than other features of the platform and workbook. Overall, teachers' experiences with Math Nation led to high rates of recommendations for continued use. All but 5 teachers (94%) indicated that they were likely or very likely to recommend that their school or district use Math Nation in the future.

NISE

Each year ALI collects customer surveys regarding NCSE and NCST satisfaction. In 2024:

NCSE (National Certificate for Stem Excellence)

- 100% of NCSE completion surveys state they would recommend the process to other campuses.
- 100% rate their coach's content knowledge and facilitation skills as 5/5 stars.
- An NCSE campus leader shared: "As a result of the NCSE process, we see an impact with student motivation and increased levels of proficiency as we began this new journey last school year. This is the beginning of the first school year as a certified STEM campus with approximately 25 STEM Certified educators. I see an immediate impact on our instructional planning that will ultimately impact student success."
- Another NCSE campus leader shared: "Intentional planning with targeted goals as a result of our work on NCSE has elevated teaching and learning across grade levels. Seeing teachers who have finished the STEM Certification (NCST) elevate their integration on campus helps raise student achievement."

NCST (National Certificate for STEM Teaching)

- 95% of NCST graduates would probably/likely recommend the NCST to a colleague.
- 96% state that the support provided by their NCST coach was helpful/very helpful.
- 50% of survey respondents state that they purchased the NCST on their own.
- 61% of survey respondents shared that their reason for completing the NCST was "I currently teach science, technology, engineering or mathematics; the NCST will help me differentiate myself as a STEM teacher."
- 28% learned about the NCST from a colleague, 42% from a district initiative.

Dissemination / Peer Reviewed

The most important part of the research process is that we conduct high quality studies of our products. Yet equally important is making sure those studies are described and disseminated. Below we present peer reviewed research papers, white papers, and conference presentations. Peer reviewed papers are written by experts in the field and undergo the scrutiny of other experts in the field. They can range in topic and type, including reviews, original research, data reports, and theory articles (to name a few). White papers are informational papers issued by a company to promote a solution to a critical problem that faces education today. Conference presentations describe research that was presented nationally and internationally to peers.

KIDE SCIENCE

A qualitative study on Kide pedagogy has been featured in the ***International Handbook of Research on STEAM Curriculum and Practice***, edited by STEAM education scholars Stephen Farenga, Salvatore Garofalo, and Daniel Ness, and published by Routledge, Taylor & Francis. This research addresses a critical conversation in STEAM education: the role of the "A" (Arts). Often undervalued and treated as merely supportive to other disciplines, the "A" frequently lacks intrinsic significance. In this study, PhD Jenni Vartiainen redefines the "A" in early STEAM education as imagination, highlighting how it bridges children's cultural practices with STEAM, preserving the richness of both. The research explores imagination as a boundary object in early STEAM education through the lens of Kide Science's Playful Inquiry method. Conducted in an English kindergarten, the ethnography-inspired study involved 21 children and their teacher participating in Kide Science programs. The dataset included nine hours of video recordings, weekly teacher reflections, observation notes enriched with photos and video clips, and teacher interviews.

The key findings were:

- **Imagination is a connector:** Imaginative play serves as a bridge between children's natural play practices and the structured practices of STEAM, fostering meaningful learning experiences.
- **Prospective education:** Imagination shifts education toward the future, preparing children for emerging, unknown challenges rather than reiterating established solutions.
- **Inclusive STEAM practices:** By framing arts as imagination, the study promotes integrating diverse cultural experiences into STEAM, dismantling the misconception that these disciplines are exclusive to certain individuals.

The study suggests that embedding imagination into STEAM pedagogy can democratize learning, allowing children from all backgrounds to merge their unique cultural ways of being and thinking with STEAM concepts. This approach makes STEAM education a meaningful and inclusive experience for all learners. The findings offer educators and policymakers a fresh, actionable framework to reimagine STEAM education. By placing imagination at its heart, we can inspire the next generation to approach science, technology, engineering, arts, and mathematics not just as subjects to learn, but as creative, inclusive tools for solving tomorrow's challenges.

This study sets a new benchmark for understanding and advancing the role of arts in STEAM education, paving the way for richer, more inclusive learning experiences.

MATH NATION

A peer-reviewed journal article about the Math Nation Study Expert videos has been conditionally accepted by "Keeping an Ear to the Ground," a practitioner journal of the National Council of Teachers of Mathematics. The article, authored by Kaitlyn May (ALI) and Liza Bondurant (Mississippi State University), highlights the demographic mismatch between the diverse student population in the US and the predominantly White, female, monolingual mathematics teaching workforce. Research shows that shared identity markers, such as race, gender, and language, between teachers and students can enhance motivation, performance, and engagement for underrepresented student groups.

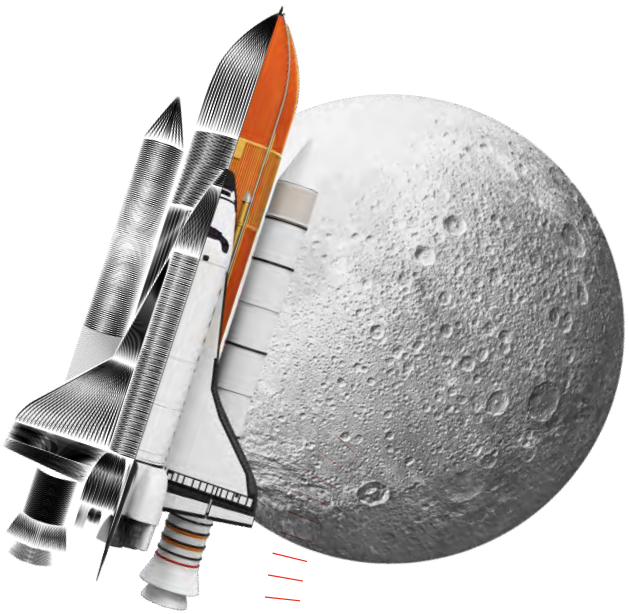
The article outlines how Math Nation addresses this representation gap through its Study Expert videos, featuring diverse educators with varying racial, gender, and linguistic identities. Students can select from multiple Study Experts for each lesson, fostering personalized learning and relatable role models. These videos integrate culturally relevant examples, making math accessible and inspiring confidence. Research supports the program's positive impact on student performance, especially in low-income and Title I schools, demonstrating improved proficiency rates across subgroups. By offering diverse and relatable educators, Math Nation promotes belonging and success in mathematics.

Scientific Conference Presentations

MATH NATION

Gates conference in NY

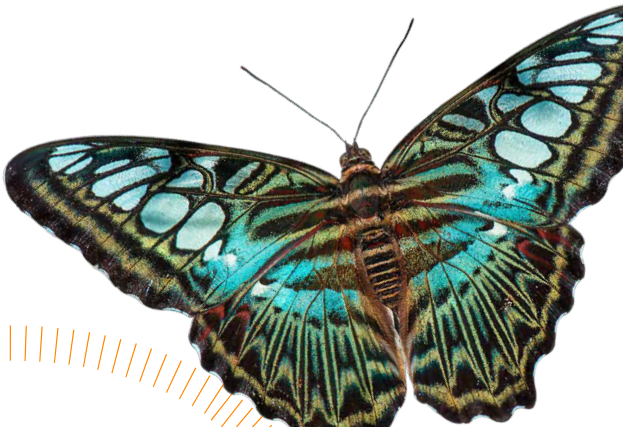
In December of 2024, the ALI Math Nation Research team attended the 6th biannual grantees gathering of the Advancing Innovative Math Solutions (AIMS) Collaboratory. As a part of the Engagement Collaborative for Research & Equity (ENCORE) Cohort, ALI and its research partner WestED function as a subnetwork of the AIMS group and officially joined the convening group in June 2024. This gathering provides grantees opportunities to develop new relationships and learn more about grantees' work to support high-quality mathematics experiences for priority students. The convening program included a mix of whole group sessions, table conversations, and concurrent sessions to support grantees in research and development on student-facing features aimed to increase student motivation, engagement, and persistence, and teacher-facing features aimed to improve teacher efficiency and effectiveness. Kaitlyn May presented in a concurrent session on the value of publicly available datasets to conducting school-level evaluations.



STEMSCOPES SCIENCE

Society of Research on Educational Effectiveness (SREE)

ALI research submitted an integrative symposium to the Society of Research on Educational Effectiveness (SREE). The SREE conference is a nationally renowned event that brings together leading researchers and practitioners to advance rigorous education research. The 2024 conference, themed "Navigating the Future of Education Research: Impact Evaluation in a Transforming Landscape," was held in Baltimore, Maryland in September 2024. ALI's integrative symposium—a symposium that integrates research across methods, policy/practice, and content—was one of only two integrated symposiums accepted for presentation. It focused on STEMscopes Science's impacts as a constructivist curriculum and included presentations by our partners at Johns Hopkins University and Texas Tech, and by our own Kaitlyn May and Janelle Montroy. The session was well received. The conference provided opportunities to meet potential new partners and explore cutting edge research and methods in the field of education. The full conference included a jam-packed schedule of paper presentations, symposia, moderated discussions, and opportunities to meet with potential grant funders and engage in meaningful discourse around creating effective education programs for all students.



Grants and Upcoming Projects

A large part of "expected soon" is ALI's submission of several grants this year and future grant results, as grants typically run for 2–5 years. Grants are awards given to companies or research universities/entities to conduct a study. Below we list our current grant support as well as two newly submitted grants. After that, "upcoming projects" are listed. These are projects that have been started and are in process, with results expected next year.

Grants

MATH NATION

Math Nation K-5 IM, Bill and Melinda Gates Foundation

Through a $4.8M investment from the Bill and Melinda Gates Foundation (BMGF), ALI began development of the first K-5 Math Nation product in 2023, centered around the created content from the Open Education Resources (OER) white label Illustrative Mathematics (IM). This investment is focused on scaling high quality OER instructional materials by supporting the development of Math Nation's K-5 curriculum so that it is aligned with OER IM. Math Nation is leveraging the OER IM curriculum to create resources and activities around the IM content, while enhancing the content by developing similar digital features that exist in the middle school/high school product line. These include Study Expert videos, Test Yourself, Check Your Understanding, and Teacher Prep videos. The research component will study the design and efficacy of the Math Nation platform to increase context, motivation, engagement, and persistence in math for Black, Latino, and low-income students.

In partnership with WestEd, rapid-cycle usability testing for the Math Nation K-5 IM product began in July 2024. To date, Math Nation has completed filming approximately 400 Study Expert videos for Unit 1 of the Math Nation K-5 IM product and are on track to complete K-5 IM product development by August 2025 to begin an additional round of testing targeted to specific features of the Study Expert videos. The rapid-cycle testing protocol leverages a process in which distinct components of the new Math Nation K-5 IM product are tested for usability, feasibility, and impact in quick succession. The usability testing plan includes sessions with diverse students and teachers engaging with the curriculum.

The findings of the usability study include the following:

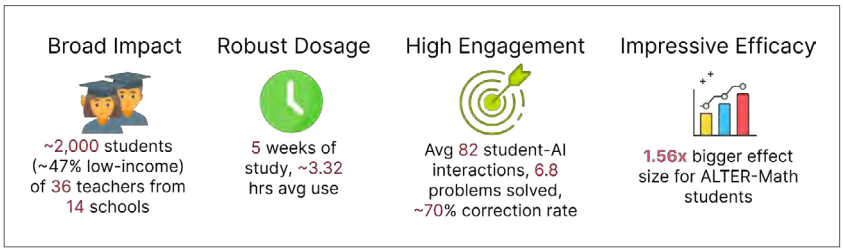
- After watching the bio videos, students were asked which Study Expert they would like to learn from. When asked why they chose a specific Study Expert, students named interests they shared with them, such as having a dog or liking cars. Some students noted that the Study Expert "knew a lot about math" or "seemed nice."
- Students performed notably better when the Study Expert works through material with them instead of instructing them to fill out the worksheet before the lesson starts.
- Students had an easier time with the lesson if they were told to use the pause button before completing the worksheet.
- Students liked lessons where Study Experts didn't "move too fast" through the material.
- Study Experts should explicitly define math-specific terms during the videos and make sure the terms and grade-appropriate.
- Teachers expressed a preference for lesson videos that start with context setting or storytelling rather than jumping right into problem-solving.
- Teachers agreed that having Study Experts use the same manipulatives for the same lesson supports classroom use of the videos. With this change, students can choose any Study Expert and will have the appropriate materials in front of them.
- Teachers reported that their students would be responsive to the bio videos and that the videos should have a balance between the personal interests of Study Expert and math-related experience that the Study Expert shares.

Math Nation Algebra 1 Alabama, Education Innovation Research Grant

ALI, in partnership with WestEd, received an $8M grant ($3M for ALI) to conduct a randomized control trial (RCT) across 34 schools in Alabama, randomly assigning half of the schools to use Math Nation for Algebra 1 (Cohort 1) while the control schools use business-as-usual Algebra 1 courses (Cohort 2). Thirty-four schools enrolled in the study for Cohort 1 and were randomly assigned to the Math Nation group (n=17) or control group (n=17) for the 2023–24 school year. All participants had the opportunity to participate in four days of in-person professional development (PD) and 10 hours of virtual PD. WestEd is currently analyzing data from Cohort 1 on the effect of Math Nation on teachers' instructional activities, student opportunities to learn, and students' achievement outcomes.

ALTER-Math LEVI Foundation

ALI received $2M in grant monies to partner with the University of Florida (UF) to develop and test an artificial intelligence (AI) powered "math tutor" to support students' math learning with Math Nation. We are developing a new math tool designed to address key learning challenges such as knowledge retention, critical thinking, and deep understanding. This tool leverages the "learning by teaching" pedagogy, where students take on the role of the teacher, explaining math concepts to a simulated audience or peers. This approach is engaging and also supports key learning processes like self-reflection and identifying misconceptions. To further boost learning outcomes, we are integrating the latest AI technologies to support and guide students throughout their math journey. We believe this tool has the potential to make a significant impact on math learning. Our initial findings show statistically significant learning growth in students who used ALTER-Math compared to students in the control group. Specifically, accessing ALTER-Math tends to increase students' learning gains (defined as post-quiz score – pre-quiz score) by 1.56 times. We have received great feedback from teachers and all of them confirmed that they would use ALTER-Math in their future teaching.



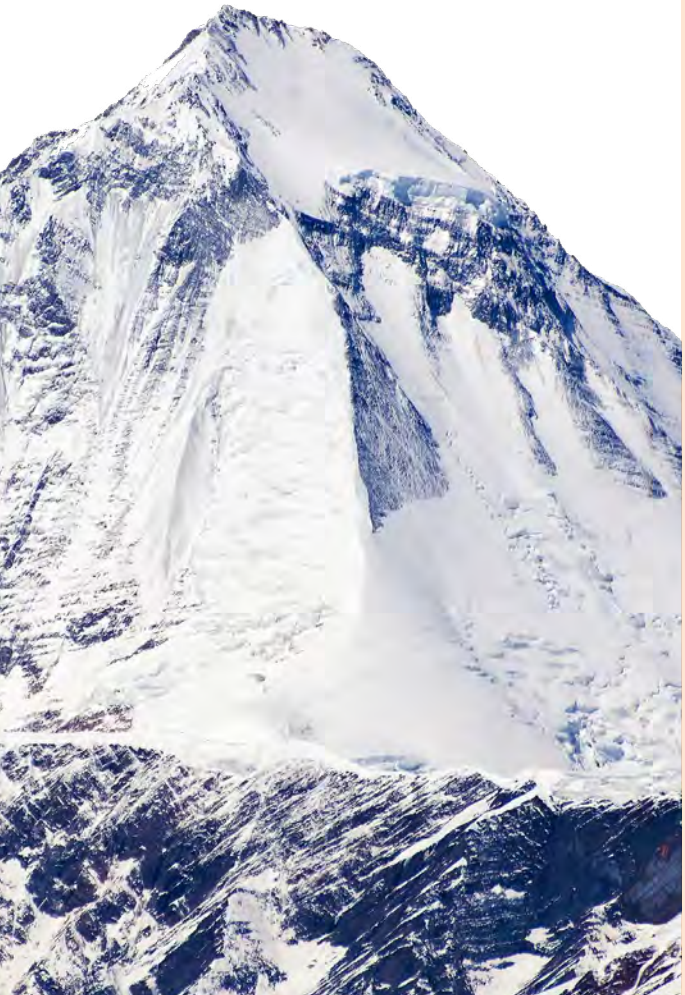
Math Nation Florida B.E.S.T. K–5 Development & 6-8 Efficacy

ALI was awarded a $2.75M grant from the Bill & Melinda Gates Foundation to support the research and development of the Math Nation Florida B.E.S.T. product line. The project has two main goals: 1) to develop a high-quality, digital print-enhanced K-5 Math Nation curriculum aligned to the Florida B.E.S.T. standards, incorporating developmental research and learning trajectories, and 2) to conduct a rigorous efficacy study of Math Nation for grades 6-8, assessing its impact on learning outcomes for priority students in Florida. With the K-5 curriculum in development, Math Nation will expand its Florida B.E.S.T. offerings to include all K-12. In partnership with WestEd, ALI will conduct a year-long impact study across Florida during the 2025–2026 academic year, using a quasi-experimental design (QED). Treatment schools will receive full access to Math Nation and its training, while control schools will follow standard curricula without Math Nation. The study will analyze the impact of Math Nation on student performance, using Florida Assessment of Student Thinking (FAST) data from all middle schools in Florida, including those in the Motivation, Engagement, and Persistence (MEP) analysis, to estimate effects overall and by student demographics. Findings from this study will provide valuable insights into the effectiveness of Math Nation in improving student outcomes and will inform future curriculum development and scaling decisions in other states and districts.

COLLABORATE SCIENCE

Education Innovation Research Grant

ALI has received $1.9M in grant monies to partner with Michigan State University and WestEd to scale-up a new evidence-based, elementary science curriculum program, Collaborate Science: Multiple Literacies in Project-Based Learning. The program will equip teachers to integrate phenomena-driven project-based learning with the principles of the Framework for K-12 Science and the performance expectations of the Next Generation Science Standards to improve student science learning. Collaborate Science integrates science learning with literacy development in day-to-day science lessons. The proposed project will fully support the implementation of Collaborate Science in Alabama and rigorously evaluate the program in participating districts with an eye on science and ELA outcomes.



Upcoming Projects

KIDE SCIENCE

ESSA Tier II Study

Kide Science has achieved the ESSA Tier IV certification as outlined above. However, we are not stopping there: the research aimed at securing the ESSA Tier II certification is already underway. With LDX research and up to $50,000 matched dollars from the Jacobs Foundation, we are running an empirical quasi-experimental study, that will result in a report and ESSA II-aligned badge if findings are positive and significant. The study will answer the following main research question: Is there a positive, statistically significant relationship between children's use of Kide and children's scores on Kindergarten literacy, math, and SEL measures (including attendance and behavior referrals, if available)? We also hope to gain insights into the mechanisms of the relationships and inform future research and development; thus, this study will answer these secondary research questions:

1. Is the relationship stronger for a specific group of children (e.g., boys versus girls, higher-income versus lower-income)?
2. Are there some Kide activities (e.g., some core ideas or cross-cutting concepts) that children ask to play and report as their favorite ones?
3. Do teachers report some Kide activities (e.g., some core ideas or cross-cutting concepts) as particularly relevant for curriculum support?
4. Which Kide activities are most suited to supporting children's problem-solving and executive functioning development, as per the latest published research?
5. Are there a certain number of lessons associated with higher gains? What is the relationship between time and progress?

Cooperation with Sesame Workshop and PAUTA: Teachers' Perceived Self-Efficacy

Kide Science has partnered with Sesame Workshop and Programa Adopte un Talento (PAUTA) to develop resources and training that will make STEM education more accessible and engaging for preschool children in Mexico. The pilot project, which is funded by Business Finland and the Ministry for Foreign Affairs of Finland, will provide quality STEM content and teacher training in 20–30 public schools. The project's long-term goal is to address existing disparities in STEM and democratize access for all children, with an emphasis on young girls and underrepresented communities. The partnership includes a research project that studies teachers' conceptions of themselves as STEM teachers and how Kide pedagogy supports their teaching and affects their philosophy of learning.

STEMSCOPES MATH

Texas Math study with LXD Research and WiKIT

ALI will continue its partnership with LXD Research and WiKIT. We will do an additional multi-year study of the impact of STEMscopes Math in combination with STEMscopes Science. The new study will include multiple years of data between 2022 and 2024 and will consider longitudinal impacts of the combination of curricula over time. It will also evaluate effects relative to a control group that uses neither curriculum.

Pleasanton ISD, Texas

ALI is conducting a math evaluation study for Kindergarten through high school in Pleasanton Independent School District in Texas (ISD). Pleasanton ISD has had STEMscopes Math for the past few years, but this year they reached out and asked for additional professional development and coaching support from ALI. With this additional support, we will run a study focused on math achievement throughout the year in Pleasanton, and we will test whether achievement significantly differs from that of students in matched control schools. We will ask secondary research questions regarding when and for whom STEMscopes Math is effective and whether additional teacher or school level factors impact student math learning with STEMScopes Math. We will use a mixed method design including qualitative and quantitative measures to both gather teachers' impressions and to fully evaluate impact.

Education Innovation Research Grant

In partnership with the American Institutes of Research (AIR) and the University of South Florida, ALI plans to submit a July 2025 Education Innovation Research (EIR) mid-phase grant to support a full randomized trial evaluation of STEMscopes Math. The project, if accepted, will run for five years with ALI will provide STEMscopes Math and professional development across the project in order to facilitate the evaluation.

STEMSCOPES SCIENCE

Crandall ISD, Texas

ALI is conducting a evaluation study for Kindergarten through high school in Crandall ISD focused on the new STEMscopes Science platform and resources. We are particularly interested in teachers' impressions of the new K–2nd grade formats. Crandall ISD has had STEMscopes Science for the past few years, but this is the first year with the new platform. We plan to leverage data longitudinally as part of our study of the changes this new platform has introduced. We will evaluate science achievement throughout the year in Crandall, and we will test whether achievement significantly differs relative to students in matched control schools for 5th, 8th, and high school STAAR scores. We will ask secondary research questions regarding when and for whom the new STEMscopes Science is effective and whether additional teacher or school level factors impact student math learning with the new STEMscopes Science platform.

NISE

North Carolina State University Research Study

The purpose of this study is to evaluate the associations between the NISE professional development micro credentialing programs and teacher outcomes. Specifically, North Carolina State University (NC State) is collecting survey data from teachers as they start NISE micro credential courses and again six months later, after they have completed at least two courses. This project has collected 117 survey responses as teachers started micro-credentialling, but unfortunately only 19 teachers responded six months later. Our partners at NC State are putting together a plan for how best to analyze the first data point and, if possible, include data from the second, although it is quite limited.

Utah STEM Action Center

NISE launched a new partnership with the Utah STEM Action Center to pilot the NCST across the state with a cohort of 40 educators. More information about this program will be shared in the future.