Across the year, the Accelerate Learning (ALI) research department has been working hard to provide strong evidence of the effectiveness of STEMscopes across science, math, and technology divisions/curricula. **We conducted 13 studies focused on providing evidence of effectiveness across the STEMscopes suite of products** as well as providing information that can help ALI improve existing products and develop new ones.
STEMscopes Science State Main Effect Studies

Quasi-experimental studies with multiple sites were conducted in several states to determine if districts that used STEMscopes had higher rates of student achievement on state exams than non-STEMscopes districts. Science achievement is assessed by state standardized science test passing rates (with higher individual student science achievement contributing to district passing rates). Although what a state considers “passing” varies from state to state, we saw positive, significant effects of STEMscopes science adoption in the following states that used STEMscopes science in at least 10% of their districts. These studies are identified as Tier 2 focused studies from Every Student Succeeds Act (ESSA) with Moderate Evidence of Effectiveness.

TEXAS
For the 5th year in a row, STEMscopes district-users in the state of Texas had higher 5th grade passing rates than districts that do not use STEMscopes science. Of the 1,148 districts (serving 403,811 5th grade students) included in the study, 427 (37.2%) districts used STEMscopes science curriculum, while the remaining 721 districts used a district-created curriculum or purchased a different science curriculum. The study found that districts using the STEMscopes science curriculum had higher average science passing rates than non-STEMscopes districts for all students and for students identified as economically disadvantaged, minority, or limited English proficient. Analyses that accounted for important demographic variables that influence achievement revealed that districts that used STEMscopes continued to have significantly higher overall science passing rates compared to districts that did not use STEMscopes even when controlling for these other variables. The increased passing rate for STEMscopes districts resulted in approximately an additional 10,000 students obtaining the state’s passing level on their science achievement test.

GEORGIA
Of the 179 districts (serving 138,791 5th grade students) included in the study, 54 (30.2%) districts used STEMscopes science curriculum, while the remaining 125 districts used a district-created curriculum or purchased a different science curriculum. The study found that districts using the STEMscopes science curriculum had a greater increase in change from 2018 to 2019 passing rates. Specifically, STEMscopes districts increased their passing rates by 3.4%, while non-STEMscopes districts only increased 1.9%. Analyses that accounted for important demographic variables that influence achievement revealed that districts that used STEMscopes continued to have a significantly higher rate of change in passing rates between 2018 and 2019 compared to districts that did not use STEMscopes even when controlling for these other variables. The increased passing rate for STEMscopes districts resulted in approximately an additional 1,784 students considered proficient.

In STEMscopes districts, additional students obtained the state’s passing level on their science achievement test.

In STEMscopes districts, additional students considered proficient.
MISSISSIPPI

STEMscopes science district-users in the state of Mississippi had higher 5th grade passing rates than districts that do not use STEMscopes. Of the 142 districts (serving 38,124 5th grade students) included in the study, 45 (31.7%) districts used STEMscopes science curriculum, while the remaining 97 districts used a district-created curriculum or purchased a different science curriculum. The study found that districts using the STEMscopes science curriculum had higher average science passing rates than non-STEMscopes districts for all students. Analyses that accounted for important demographic variables that influence achievement revealed that districts that used STEMscopes continued to have significantly higher overall science passing rates compared to districts that did not use STEMscopes even when controlling for these other variables. The increased passing rate for STEMscopes districts resulted in approximately an additional 382 students obtaining the state’s passing level on their science achievement test.

CALIFORNIA

STEMscopes district-users in the state of California had higher 5th grade passing rates than districts that do not use STEMscopes. Of the 1,181 districts (serving 467,309 5th grade students) included in the study, 169 (14.3%) districts used STEMscopes science curriculum, while the remaining 1,012 districts used a district-created curriculum or purchased a different science curriculum. The study found that districts using STEMscopes science had higher average science passing rates than non-STEMscopes districts for all students and for students identified as economically disadvantaged, students with a reported disability, and Latino students. Analyses that accounted for important demographic variables that influence achievement revealed that districts that used STEMscopes continued to have significantly higher overall science passing rates compared to districts that did not use STEMscopes even when controlling for these other variables. The increased passing rate for STEMscopes districts resulted in approximately an additional 3,699 students obtaining the state’s passing level on their science achievement test.

SUMMARY

Across four US states with at least 10% of districts utilizing STEMscopes science curriculum, we saw a significant positive effect of STEMscopes science on district passing rates relative to districts that did not use STEMscopes science. Specifically, we estimate that approximately an additional 15,865 5th grade students passed their state’s respective science passing level with the help of STEMscopes science.
This study tested the theory that district use of STEMscopes science curriculum increases reading and mathematics proficiency through increases in science proficiency. As noted above, STEMscopes science districts had significantly higher science passing rates compared to districts that did not use STEMscopes science. This is the first path (first step of the process) in the mediation model. The next step in the model was to test whether science proficiency predicted reading and math proficiency (tested separately) for the same year. Results indicated science proficiency rates predicted districts' reading and math proficiency rates. As an overall test of the two-step process (STEMscopes -> science -> reading or math), the final step considered both steps together. For reading (controlling for previous year [4th grade] reading passing rates), districts that used STEMscopes had a significant increase in reading proficiency (through STEMscopes, effect on science) compared to non-STEMscopes districts. **This change equated to approximately 2,800 more children meeting the reading benchmark within STEMscopes districts.** Results also indicated a positive significant increase in math passing rates for STEMscopes science versus non-STEMscopes districts with approximately 2,417 more children meeting the math benchmark within STEMscopes districts.

**GEORGIA**

As noted previously, STEMscopes science districts increased their science passing rate between 2018 and 2019 compared to districts that did not use STEMscopes science. The next step in the model was to test whether this increase in the science proficiency rate predicted ELA and math proficiency (tested separately) for the same year. Results indicated increased change in science proficiency rates predicted districts' ELA and math proficiency rates. As an overall test of the two-step process (STEMscopes -> science -> reading or math), the final step considered both steps together. For ELA, districts that used STEMscopes had a significant increase in ELA proficiency (through STEMscopes, effect on science) compared to non-STEMscopes districts. **This change equated to approximately 1,759 more children meeting the reading benchmark within STEMscopes districts.** Results also indicated a positive significant increase in math passing rates for STEMscopes science versus non-STEMscopes districts with approximately 757 more children meeting the math benchmark within STEMscopes districts.

**Texas**

This study tested the theory that district use of STEMscopes science curriculum increases reading and mathematics proficiency through increases in science proficiency. As noted above, STEMscopes science districts had significantly higher science passing rates compared to districts that did not use STEMscopes science. This is the first path (first step of the process) in the mediation model. The next step in the model was to test whether science proficiency predicted reading and math proficiency (tested separately) for the same year. Results indicated science proficiency rates predicted districts' reading and math proficiency rates. As an overall test of the two-step process (STEMscopes -> science -> reading or math), the final step considered both steps together. For reading (controlling for previous year [4th grade] reading passing rates), districts that used STEMscopes had a significant increase in reading proficiency (through STEMscopes, effect on science) compared to non-STEMscopes districts. **This change equated to approximately 2,800 more children meeting the reading benchmark within STEMscopes districts.** Results also indicated a positive significant increase in math passing rates for STEMscopes science versus non-STEMscopes districts with approximately 2,417 more children meeting the math benchmark within STEMscopes districts.

**See Full Study Here**

In STEMscopes districts, +2,417 additional students obtained the state’s math benchmark.

**See Full Study Here**

In STEMscopes districts, +757 additional students obtained the state’s math benchmark.

**Texas**

[See Full Study Here](https://bit.ly/TexasStaarAssessment)

**Georgia**

[See Full Study Here](https://bit.ly/GeorgiaStateAssessment)
MISSISSIPPI

STEMscopes districts that utilized STEMscopes science curriculum had students score higher on state exams in ELA and math than districts that did not use STEMscopes. This change equated to approximately 298 more children meeting the ELA benchmark within STEMscopes districts. Results also indicated a positive significant increase in math passing rates for STEMscopes science versus non-STEMscopes districts with approximately 344 more children meeting the math benchmark within STEMscopes districts.

In STEMscopes districts, +344 additional students obtained the state’s math benchmark

[SEE FULL STUDY HERE](https://bit.ly/MISSISSIPPISTATEASSESSMENT)

CALIFORNIA

A study investigated whether districts that used STEMscopes to increase science achievement did better in ELA and math in addition to science. The study looked at ELA and math scores from students in districts that used STEMscopes science compared to students in districts that used another program. The results were favorable showing that STEMscopes had an impact on increasing ELA and math scores in students through science instruction using STEMscopes. This change equated to approximately 3,265 more children meeting the ELA benchmark within STEMscopes districts. Results also indicated a positive significant increase in math passing rates for STEMscopes science versus non-STEMscopes districts with approximately 3,078 more children meeting the math benchmark within STEMscopes districts.

In STEMscopes districts, +3,078 additional students obtained the state’s math benchmark

[SEE FULL STUDY HERE](https://bit.ly/CALIFORNIASTATEASSESSMENT)

SUMMARY

Across four US states with at least 10% of districts utilizing STEMscopes science curriculum, we saw a significant positive effect of STEMscopes science on district reading or ELA and mathematics passing rates through science, relative to districts that did not use STEMscopes science. Specifically, we estimate that approximately an additional 8,122 5th grade students passed their state’s respective reading or ELA passing level, and 6,783 additional 5th grade students passed their state’s respective math passing level with the help of STEMscopes science curriculum.
Usage Studies

Usage studies focus on the potential positive relationship between usage of the STEMscopes curricula materials and student achievement outcomes; we anticipated that increased usage would be associated with higher student achievement.

**STEMscopes Science**

**FLORIDA**

The results of this study showed that frequency of STEMscopes use, as measured by how often teachers accessed STEMscopes components online, predicted student gains in science proficiency. That is, schools that used STEMscopes more frequently were more likely to experience gains in science proficiency. In the 2018–2019 school year, schools that used STEMscopes did not show a change in science proficiency, on average. However, when taking into account frequency of STEMscopes use, schools that were considered high users of STEMscopes increased an average of 5 percentage points from 2018 to 2019, compared to the state average decrease of 4 percentage points. These results support previous research showing that inquiry-based science instruction has a cumulative effect on student science achievement. The more exposure students had to inquiry-based science through STEMscopes, the better they performed on the Florida state science assessment.

**STEMscopes Math**

**TEXAS**

Results indicate that for third and fourth grade teachers (n = 6) and their students (n = 151) in Galveston ISD who used the STEMscopes mathematics curriculum in school year 2020-2021, there were significant increases in their standardized math achievement test scores related to 1) teacher reported weekly use of the STEMscopes math curriculum, and 2) teacher reported increases in students’ enjoyment of using STEMscopes math. Usage and enjoyment were also significant predictors of the benchmark “student approaches grade level” math achievement (the passing rate benchmark for Texas), and usage was a significant predictor of the benchmark “student meets grade level” for 4th grade, but not 3rd grade students. Overall, results indicate that using the program more, and increases in student enjoyment of STEMscopes math across the year, play a key role in student math achievement.

**STEMscopes Coding**

At the end of the 2020-2021 school year, we surveyed teachers and students who used STEMscopes Coding during the school year. We asked teachers and students how they liked STEMscopes Coding, how much they were using the program, what elements were their favorites, what skills STEMscopes Coding may improve, and how it may relate to future career aspirations. We also asked teachers and students about their perceived motivation related to coding—defined as efficacy, values, and motivational cost—and gave them a very brief knowledge check. Results indicated that teachers and students felt similarly positive about STEMscopes Coding and are using coding fairly regularly (at least once a week) on average, and that students using STEMscopes Coding tended to be interested in STEM-related careers. We found many predictive relationships with teacher and student reported outcomes. Specifically, we found that teacher reported value regarding the importance of coding significantly predicted how much they use STEMscopes in the classroom, and teacher efficacy using STEMscopes Coding predicted teacher reported student enjoyment of the program. There were trend level findings with teacher perceived motivational cost potentially negatively affecting teacher recommendations for use and teacher perceived value potentially increasing student enjoyment. For students: perceived motivational cost was negatively associated with how much they liked to learn about coding and their knowledge of coding; student efficacy increased student liking; and student perceptions of the value of coding increased their liking and coding knowledge. Finally, student reported efficacy was indirectly associated with student coding knowledge through its positive effect on student enjoyment, which in turn increased student knowledge.
Case Studies

This year, the research department was requested to help present case study data for Dunne STEM Academy, as well as to collect and analyze data regarding teacher needs in Texas.

---

**STEMscopes Science**  
**ILLINOIS - DUNNE STEM ACADEMY**

Using state data from Illinois, we found that across three years of STEMscopes science use, Dunne STEM Academy Elementary School increased their science proficiency passing rates on the Illinois Science Assessment by 18 percentage points. By 2019, Dunne academy was significantly outperforming the district passing rate by 30 points, and the state passing rate by 15.5 points. Of note, 100% of the students enrolled at Dunne STEM academy in 2019 were African American students. This means we can also compare Dunne’s results to other African American students in the district and state. These results indicate a large significant difference such that African American students at Dunne STEM Academy significantly outperformed African American students in the district, and across the state. This was also the case for low income students at Dunne STEM academy compared to the district and state.

**UP 18**  
in student science proficiency passing rates in three years time

---

**STEMscopes Science**  
**TEXAS - TEACHER SURVEY**

During May 2021, we surveyed teachers in Texas about STEMscopes. We focused on understanding their usage and training as well as what they liked, and what they would like to see improve. Of the 559 teachers from all over Texas who responded, the vast majority were veteran teachers who are mostly using STEMscopes science, although all other products were represented, with many teachers using multiple products. Teachers responded favorably to survey questions with one-third of teachers noting that they used STEMscopes as their primary resource. The more often teachers used STEMscopes, the more their students used STEMscopes and reacted positively to using it. Areas for potential improvement may include training, as a high percentage of teachers have not been trained on STEMscopes in over two years and roughly 12% noted they were never formally trained. Training by STEMscopes was a significant predictor of whether teachers felt they needed more training and of increased student use of STEMscopes. The most asked for improvements or new features included more user friendly websites, with many of the open-ended responses focused on more user-friendly virtual and interactive tools, more training around virtual tools, and the website designed and organized for virtual and possibly independent use at home (e.g., more sections with readers for students, guides to walk through sections).

---

**SUMMARY**

These studies help us to evaluate more closely the impact of STEMscopes within specific schools and respond to teacher likes and needs in the future.

---

learn more at STEMscopes.com