Research on the Impact of STEMscopes™ on Science Teaching and Learning

Impact on science achievement in 8th grade science:
- The STEMscopes™ research team collected and analyzed science proficiency and demographic data across two academic school years (2010-2011 and 2011-2012) for 6,493 8th grade students from 38 classrooms in 12 schools in a medium-sized Texas school district.
- The research team asked whether a student was more likely to be proficient or advanced on the Texas state science assessment in the second year, when STEMscopes™ was implemented in their classroom.
- The team found that being in a STEMscopes™ classroom made students 1.52 times more likely to score proficient on the science exam as compared to students who did not have STEMscopes™ in their science classroom.
- The team also found that being in a STEMscopes™ classroom made students 1.21 times more likely to score advanced on the science exam as compared to students who did not have STEMscopes™ in their science classroom.

Impact on science achievement in 5th grade science in 2011-2012:
- In one large urban Texas district:
  - The STEMscopes™ research team collected and analyzed science proficiency and demographic data for 3,704 5th graders in 2011-2012 in 41 schools that use STEMscopes™.
  - The research team asked whether higher levels of teacher use of the STEMscopes™ curriculum were related to higher levels of student achievement on the 5th grade STAAR™ science test.
  - The team found that the level of curriculum use was indeed positively related to student achievement: students in schools that had higher teacher use of STEMscopes™ outperformed their peers in schools with lower levels of teacher use of STEMscopes™, even controlling for demographic and school differences.
- In the same large urban Texas district:
  - The STEMscopes™ research team examined if subgroups of students (e.g., minority students and students who were considered economically disadvantaged, limited English proficiency, and had a special education status) were more proficient in science when in schools that used STEMscopes™.
  - Using a quasi-experimental design, we compared scores for student subgroups in 27 elementary schools that were considered high-STEMscopes™ users and a comparison group of 27 non-STEMscopes™ schools statistically matched based on student- and school-level characteristics.
  - Results showed that students with limited English proficiency had higher STAAR™ scores and were more likely to score advanced on the STAAR™ test in STEMscopes™ schools compared to non-STEMscopes™ schools.
  - Results also showed that students with a special education status were more likely to achieve a passing score on the STAAR™ test when in schools that used STEMscopes™.
- Across 634 Texas public school districts:
  - The STEMscopes™ research team compared 5th grade district passing rates for districts that adopted STEMscopes™ to rates for districts that adopted a different science curriculum.
Controlling for demographic differences, the team found that in districts that adopted STEMscopes™, 3.8% more students passed the 5th grade science exam. The team also found that in STEMscopes™ districts:
- 3.07% more low income students passed the exam,
- 5.17% more African American students passed the exam,
- 3.04% more Latino students passed the exam, and
- 6.20% more students with limited English proficiency passed the exam.

Impact on science achievement in 5th grade and 8th grade science in 2012-2013:
- Across all Texas public school districts (excluding charter/alternative districts and districts with fewer than 20 students who took the STAAR™ test):
  - The STEMscopes™ research team compared district STAAR™ science passing rates for all students and for economically disadvantaged students between districts considered high-users of STEMscopes™ and districts that did not use STEMscopes™, controlling for several student- and school-level covariates.
  - For 5th grade, district passing rates for all students were 5.11 percentage points higher for all students and 6.01 percentage points higher for economically disadvantaged students in districts that were high users of STEMscopes™ (N = 51) compared to non-STEMscopes™ districts (N = 565).
  - For 8th grade, district passing rates for all students were 5.34 percentage points higher for all students and 8.07 percentage points higher for economically disadvantaged students in districts that were high users of STEMscopes™ (N = 29) compared to non-STEMscopes™ districts (N = 633).
- All of these differences were statistically significant.

Survey results (2012-2013):
- The STEMscopes™ research team administered a survey to 210 elementary school science teachers who use STEMscopes™ and 103 elementary school science teachers who do not use STEMscopes™ in a large urban district in the winter of 2012-13.
- The surveys asked teachers about their support for teaching science in their classroom, whether they received training on their science curriculum, how often they accessed their science curriculum website, and their attitudes toward their science curriculum and its teacher dashboard.
- The research team found that 50% of the STEMscopes™ teachers reported having received training on their curriculum compared to only 10% of non-STEMscopes™ teachers.
- The team also found that STEMscopes™ teachers...
  - Reported accessing their curriculum website more frequently,
  - Reported having more positive attitudes about their science curriculum and teacher dashboard, and
  - Reported that they received more support for teaching science in their classroom compared to non-STEMscopes™ teachers.