

mySci and Student Achievement Case Study: Pattonville



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The mySci K-8 science program supports educators with curriculum, professional development, and materials logistic management so that every teacher can provide interactive learning experiences for students. mySci's kit-based curriculum units are aligned with national and Missouri state science standards and include all the materials for hands-on classroom activities. The mySci team delivers, picks up, and then refurbishes kits so that teachers can provide engaging, hands-on science experiences without needing to store or manage inventory throughout the year. mySci works in close partnership with schools and districts to tailor programming to fit district-specific needs. Each year, over 100,000 students in the St. Louis region learn science using mySci.

This case study looks at the change in district wide science achievement across the curriculum adoption process focusing on the first full year of mySci implementation. Evaluators reviewed student results on K-5 mySci pre- and post-tests, and compared fifth grade mySci scores to the Science Missouri Assessment Program (MAP) test administered by the Missouri Department of Early and Secondary Education (DESE) in 2015-2016.



MYSCI ADOPTION AND IMPLEMENTATION

The suburban Missouri school district studied includes six elementary schools with over 200 participating teachers. In 2015 district enrollment was approximately 5,500 students overall, including 2,500 K-5 students, placing the district in the top quartile for Missouri. This racially diverse district had approximately 50% White and 30% Black student enrollment, and approximately 50% of students qualified for the federal Free and Reduced Lunch Program.

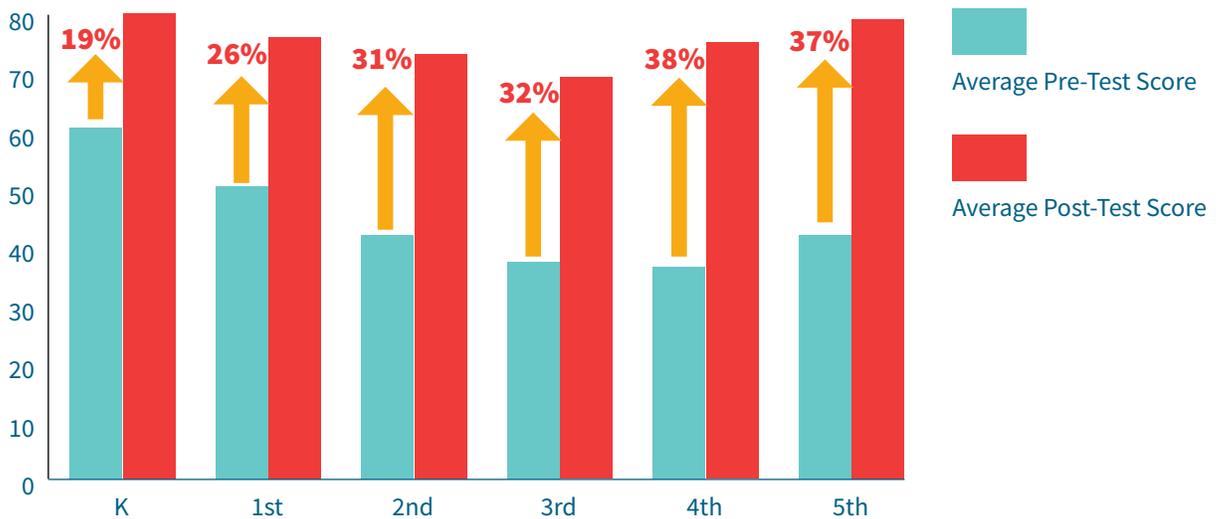
The curriculum adoption process began with district consultation and a limited pilot during the 2014-2015 school year. District-wide implementation of mySci's K-5 curriculum began in the 2015-2016 school year with introductory professional development and further professional learning opportunities offered throughout the year. mySci's professional development program is content-focused, featuring opportunities for active learning, coaching, collaboration, modeling, feedback, and reflection. mySci instructional specialists

also conducted learning walks with administrators in each school to further build district capacity for holistic science teaching and learning. Feedback from professional development sessions and learning walks was used to monitor implementation and in mySci’s continuous quality improvement.

SCIENCE INTERIM ASSESSMENT SCORES

Each mySci unit includes pre- and post-tests to assess student knowledge and learning growth. On average, K-5 students had a 31 percentage-point gain on their mySci unit post-tests over their pre-test scores (n=10,092 pre-post pairs, N=2523 students). These gains were statistically significant and consistent across units with slightly larger gains as the grade levels increased.

Average Student Growth between mySci Pre-Test and Post-Test Scores 2015-16

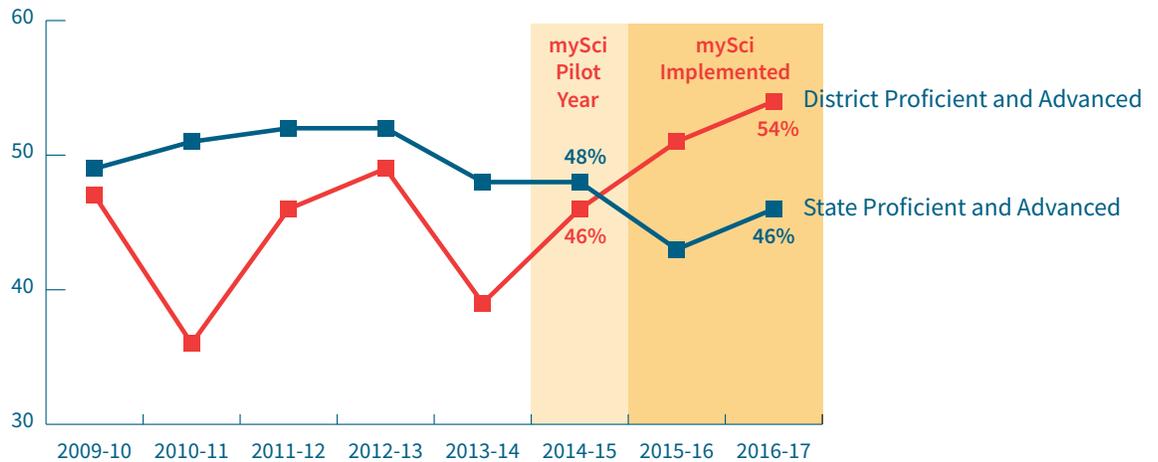


MAP TREND ACROSS IMPLEMENTATION

Prior to mySci adoption, the student achievement at the Proficient and Advanced level on the 5th Grade Science MAP test lagged behind the state-wide average achievement from 2010 until mySci implementation. During the 2014-2015 pilot year, 46% of students in the district achieved at the Proficient or Advanced level on the 5th Grade Science MAP test compared to 48% of students state-wide. However in 2015-2016, the first year of mySci K-5 implementation, 51% of district students achieved at the Proficient or Advanced level and in the second year of K-5 implementation (2016-2017), 54% of students in the district performed at the Proficient or Advanced level. The district had a 6% point gain in the first

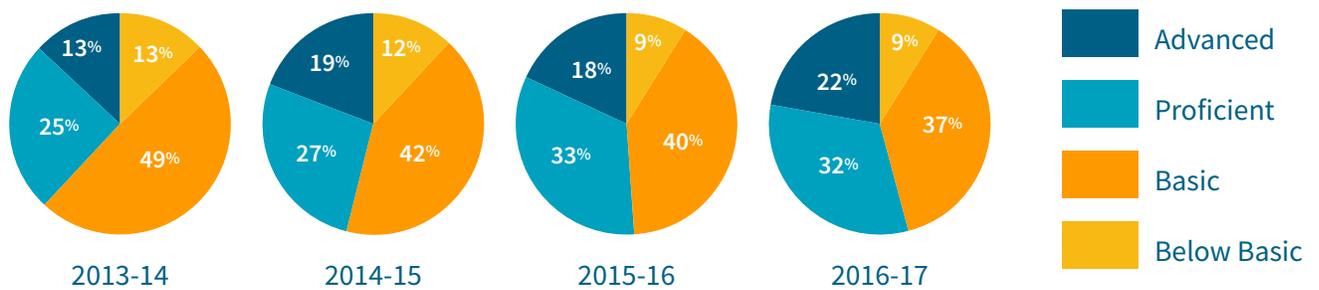
two years of mySci implementation, which compares favorably to the state's 2% point loss over the same time period¹.

Student achievement grew after implementing mySci, outpacing state-wide averages



These gains were not limited to those high performing students, with the full distribution of student performance on the Fifth Grade Science MAP shifting toward higher achievement levels, especially when compared to the state.

The share of students performing at higher levels increased each year of partnership with mySci across achievement levels



¹The state of Missouri changed the 5th Grade Science MAP during the 2017-2018 school year and no data was released during calibration. While the 2018-2019 5th Grade Science MAP scoring & achievement is not comparable to prior years, this district's achievement met slightly higher than state-wide achievement (43.4% in district scored at Proficient or above compared to 42.5% state-wide). No MAP testing was completed for the 2019-2020 school year due to the COVID-19 pandemic.

“Consistency of science instruction is happening – it is taught much more consistently in our schools and that has to happen for kids to learn it. And not only it has been taught but the emphasis and embracement of it, not just science, but STEM.”

– School principal

MYSCI AND MAP SCIENCE ASSESSMENTS

In an analysis of fifth grade assessment scores, higher student pre- and post-unit test scores were correlated with higher scores on the Science MAP. Pearson correlation between Science MAP and mySci post-test scores ranged from $r = .539$ to $r = .603$ and were statistically significant in two-tailed testing ($n=379$ students).

The correlation with Science MAP scores was greater for post-test than for pre-test scores, suggesting that student learning within the mySci units better predicts Science MAP scores than students’ overall individual achievement level or prior knowledge. However, Science MAP scores were not correlated with student growth between pre- and post-testing, indicating that student learning was consistent across achievement levels and not limited to just the lowest or highest performing students.

Correlation with 5th Grade MAP Science Score	
mySci Pre-Test Average Score	0.482**
mySci Post-Test Average Score	0.5715**
Average Growth Between mySci Pre- and Post-Tests	0.026

** Correlation is significant at $p \leq 0.01$ in 2-tailed t-test

CONCLUSION

This case study illustrates the increase in student science performance on state-wide standardized tests and explores student science achievement on mySci unit assessments in a suburban Missouri public school district during curriculum adoption and early implementation. During the first two years of mySci use, this suburban Missouri district experienced growth in fifth grade student achievement on the Science MAP standardized test, outpacing previous performance and the statewide average. mySci pre- and post-test analysis shows growth in student knowledge at each K-5 grade level, and that performance on curriculum assessments is correlated with MAP scores. Importantly, this analysis demonstrates that growth in learning occurred evenly across student skill levels. This evidence suggests that mySci implementation may increase student achievement and support positive outcomes for schools and students.

