

Case Study

Outstanding Math Achievement: Challenge Accepted at Struthers City School District

Our partnership has helped the district significantly improve student scores on the Ohio state AIR exam.

Struthers City School District Demographics:

- **Grade Level:** PreK-12
- **Race:** White - 76.5%, Hispanic - 8.7%, Multiracial - 7.5%, Black - 6.7%
- **Economically disadvantaged:** 76.5%
- **Students with disabilities:** 14%
- **English learners:** 1%

At Carnegie Learning, we've developed a predictive metric in MATHia, our AI-driven math tutoring software, called the APLSE (Adaptive Personalized Learning Score). This score uses the data from each student's work in MATHia to measure whether they are on track to meet end-of-course goals, and accurately predicts how they will perform on assessments at the end of the year.

When we shared this information with Jim Franceschelli, a 7th grade math teacher at Struthers City School District, he decided to take us up on that challenge.

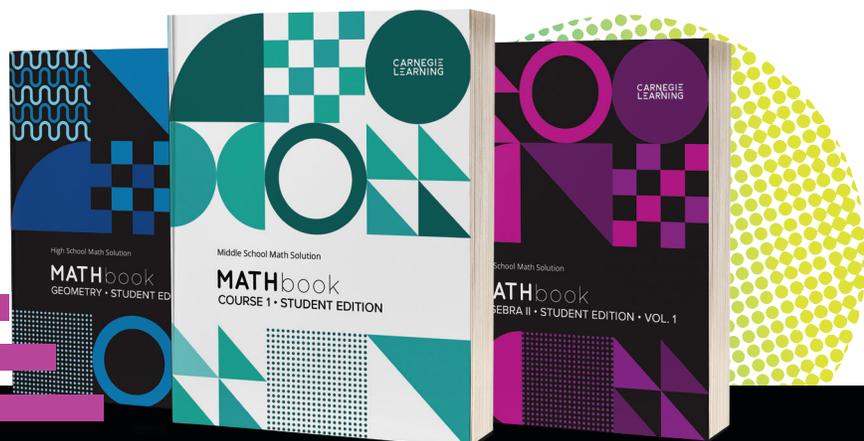
A New Way of Learning:

For 18 years, Struthers City School District discussed transitioning from a traditional textbook curriculum, but wasn't able to agree on a new program. When Pete Pirone became superintendent, he took action.

The district's traditional textbook approach was not showing the test results they needed. So, in 2017, the district began implementing the Carnegie Learning Middle School and High School Math Solutions, which combine consumable textbooks and MATHia software to support student-centered, collaborative math learning and deep conceptual understanding. They were blown away by the results.

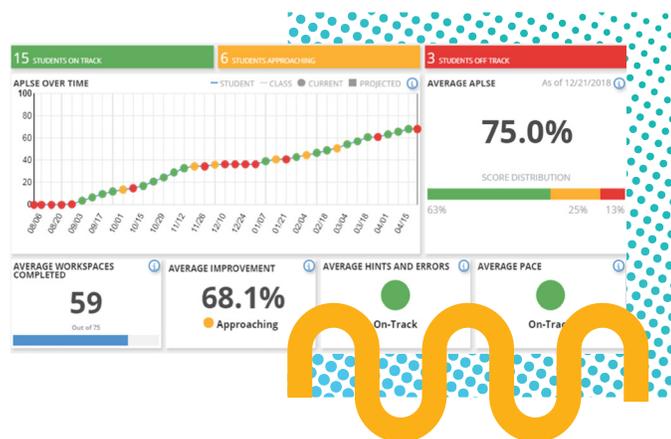
"We have data that shows that Carnegie Learning is working," says Superintendent Pirone.

Rob Gelonese, Assistant Principal at Struthers Middle School, agrees. "I really believe that when you marry the cooperative group work model along with all the things that Carnegie Learning offers in the text and online, you have the best marriage of all the best math practices put together."



Accurately Predicting State Exam Scores

When Mr. Franceschelli heard our claim that an APLSE score of 70 or higher indicates a 90% likelihood of passing the state exam, he decided to start collecting his students' data to see if it was true. (Ohio students take the AIR exam, developed by the American Institutes for Research.)



"We've seen remarkable results," he says. "Of the kids who got to green or yellow* on the APLSE meter, 37 of the 42 increased their scores on the AIR test. Those were crazy numbers for us."

A statistical analysis found that from 2018 to 2019, a 10% increase in APLSE predicted an average 4.3 point increase in AIR scores.

Improved AIR Test Scores

That's not all. In the 2018-19 school year, 6th grade students' scores on the AIR exam grew by 10.9% and 8th grade students' scores increased by 9.5%. (Scores increased for 7th grade students by 9.3% from 2017-18 and have stayed consistent.) Students who showed greater success in MATHia tended to demonstrate more growth in knowledge as measured by AIR scores. "The data that shows our results, what Carnegie Learning has done for us, speaks for itself," says Mr. Franceschelli.

*APLSE scores are coded red for basic, yellow for proficient, and green for advanced.

Fostering Student Agency

The benefits go beyond just test scores. Struthers City students have learned to take ownership of their learning through collaborative group work with the textbook and individual, differentiated instruction through MATHia.

Mr. Franceschelli observes, "Our kids have really become reliant on themselves and on each other, more than the teacher. That's been huge for us, making the transition from me standing at the board, teaching, teaching, teaching, and handing out worksheets. This is more of 'you're going to learn this concept and grasp it before moving on.'"

This mastery-based approach in MATHia allows students to perform at their full potential.

"They can work at their own pace. Some get ahead, really far ahead. The kids who are behind a little bit—the program encourages them to keep going and get there."

AP Gelonese also points out how the 'Step by Step' feature in MATHia, which walks the student through a sample math problem, accelerates learning. "You see a lot of other programs that'll give the student another question, but I haven't seen any others that'll give them a tutorial along the way. That really differentiates Carnegie Learning from other programs."

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Jim Franceschelli, Math Teacher
Struthers Middle School

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Building Student Confidence

Struthers City students have also developed more confidence. AP Gelonese has even witnessed this on a personal level.

"I have a son in 7th grade who typically struggles in school. He works really hard and is conscientious, but school is hard for him," he explains. Last year, during remote learning, AP Gelonese's son needed a lot of help with his work. This year, after using MATHia, he hasn't asked for help at all.

"I'm really thankful to Mr. Franceschelli. He and the Carnegie Learning program encourage these kids to be more independent and not be afraid to fail and make mistakes. It has caused my son to grow up a lot in his ability to do math and his confidence in math."

Supporting Teachers in Their Practice

Not only have Struthers City students felt an impact, but the teachers have as well.

Carnegie Learning's math solutions make teachers' jobs easier by providing a well-structured and intentionally organized scope and sequence. "This helps me organize and gives me a schedule of what we're doing every day," Mr. Franceschelli says.

Teachers' performance scores have also gone up as their students perform better.

"As a teacher, for a couple of years, I was in the red," he says. "We got started with Carnegie Learning, and in a one-year span, I was in the green."

But it's not just about scores and numbers. Carnegie Learning helps build teacher skills as well.

AP Gelonese appreciates that the Carnegie Learning Math Solution helps teachers to foster student independence. "Allowing productive struggle is hard for some teachers because they want to rescue their students. But it's important because it develops more independence in students. We're seeing more and more of that in our teachers."

A Partner Every Step of the Way

Superintendent Pirone also attributes their district's success to Carnegie Learning's exceptional professional learning and support services.

AP Gelonese agrees. "I've seen it not only at the school level, but also at the national level at LONG + LIVE + MATH: The National Institute. At Carnegie Learning, they really, really listen. And because of their listening, they make adaptations. They're listening to teachers, and teachers are helping them to refine things."

Mr. Franceschelli simply states, "I know this for a fact. Carnegie Learning has changed me as a teacher."

Hope for the Future

The team at Struthers City School District is looking forward to seeing continued growth, not only in student achievement, but also in developing their students as self-reliant, collaborative, and confident learners. In addition, Struthers City math teachers are planning to attend LONG + LIVE + MATH: The National Institute this year to further develop their practice, connect with peers from all over the country, and prepare for the upcoming school year. "It'll take us to a whole other level," AP Gelonese says.