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Math, science program gets results, may get axe Alabama Math, Science and Technology Initiative Federal grants set to expire; state is asked to pick up tab

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DECATUR | The squeak of tennis shoes against linoleum provided the soundtrack, and the partners stood at an awkward, adolescent distance. A black wire dangled between them like some digital-age umbilical cord.

Up. Right. Back, back, back.

They called out in monotones, directing one another's steps in a strange waltz that mimicked the gray line inching along the screen of their handheld computers.

It's a typical math class here at Cedar Ridge Middle School, where on this particular day/seventh-graders are learning about distance, velocity and slope -- complex concepts normally reserved for high school classrooms.

"This will give them something concrete so that when I give them definitions tomorrow, they'll have something to relate it to," explains teacher Jeanne Simpson.

That hands-on philosophy of learning is at the heart of the Alabama Math, Science and Technology Initiative of which Cedar Ridge is one of 72 pilot schools in the state.

The brainchild of a committee of educators and business and industry leaders, AMSTI seeks to improve math and science education in Alabama's public schools while giving students knowledge and skills needed to succeed in postsecondary education and the work force.

For the last three years, the program has been funded through federal grants, primarily from the National Aeronautics and Space Administration.

But with funding set to expire at the end of this school year, the Alabama State Department of Education is asking the Legislature for \$15 million, money that would maintain the existing AMSTI sites in Huntsville, Florence and Mobile as well as expand the initiative to include 35 school districts.

"That [federal money] is going away fast, and unless the state funds this request, we have a strong chance of losing the Huntsville and Florence sites, and that would be a tragedy," said state Superintendent Joe Morton, noting that the Mobile program is supported through separate funding out of the No Child Left Behind Act of 2001.

A tragedy, proponents of the program argue, because AMSTI is already reaping results.

Last year, students in grades 3-5 enrolled in AMSTI schools scored on average in the 51st percentile on the math portion of the Stanford Achievement Test compared to an average 40th percentile for non-AMSTI students.

In seventh-grade science, AMSTI students averaged in the 63rd percentile on the SAT compared to the 58th percentile for their non-AMSTI counterparts.

"That was a surprise," said Brenda Terry, education and public outreach specialist for the National Space Science and Technology Center, a division of the University of Alabama in Huntsville. "You normally don't expect to see those types of results in just one year."

The whole package

AMSTI works, educators say, because it combines research-based teaching methods and curriculum with individualized training for teachers backed up with professional development and continuing support.

For example, a school interested in becoming an AMSTI school would first be required to send its math and science teachers, along with their administrators, to a two-week summer institute for two consecutive years.

There, teachers learn how the curriculum works, as well as techniques for teaching it through hands-on experiments and activities that are supplied by the initiative in a series of kits or "modules."

Joey Brown, a middle school math teacher who in his role as an AMSTI specialist this year assists other teachers in implementing the program in their classrooms, said students aren't the only ones who benefit from the learning-by-doing approach to math and science.

"I've heard teachers say, 'I've never understood that until I came here, and I've been teaching for 20 years,'" Brown said.

Brown said he "fell in love" with AMSTI when he returned to his own classroom from summer training and began getting what he calls "the aha moments" -- that flash in time when students make the connection between what they've been told

and what they understand.

The best way to help those moments along is to let students find them for themselves, according to the AMSTI model. As Brown puts it, learning takes place not when students are given the answers, but when they're asking the questions.

Fish scales and thumbprints

This "inquiry-based" style of learning also encourages students to think in terms of concepts, rather than facts and figures. Once they understand why something works the way it does, they can apply that to other areas of their schoolwork, and their lives.

At Crestline Elementary School in Hartselle, fifth-graders are using miniature microscopes -- supplied by AMSTI as part of the earth science module -- to examine fish scales.

Once again, the teacher Stacy Alexander, is doling out more questions than answers: What shape is your fish scale? Can you think of something else that looks the same way? Does your neighbor's fish scale look the same as yours?

Within minutes, each table of students is absorbed in its own discussion of the tiny pearlescent flakes peering back at them from the eyepiece.

One boy comments that the ridges resemble a thumbprint, launching an intense conversation within the group about how humans are unique from one another. Just like snowflakes, offers his classmate.

To Reba Turk, the AMSTI science specialist assigned to Crestline, the students' chatter is an example of how inquiry-based learning helps students become engaged in science.

Learning moves from being something they have to do to something they want to do, she said.

"The first thing my fifth-graders ask me is when are we going to do this, and when are we going to do that? And they're all science modules," Turk said. "It's the highlight of their day."

From 'Rithmetic to Reading

That excitement for learning translates into other areas as well, say educators who cite reading as an example. They point to studies showing that reading and other language-arts skills improve significantly when coupled with hands-on science programs.

Robin Denson, executive director of the Alabama Mathematics, Science and Technology Education Coalition that lobbies on behalf of AMSTI, said it's appropriate that the state Department of Education is asking the Legislature for \$15 million for AMSTI at the same time it is requesting full funding for the Alabama Reading Initiative.

Similar to the math and science initiative but in existence for a few years longer, the reading initiative aims to achieve 100 percent literacy among Alabama students through research-based curriculum and teaching techniques.

"The kids need both. Our work force needs both. Our economic development needs both," Denson said.

A key goal of the math, science and technology coalition, or AMSTEC, is to build communication and cooperation between the education community and business and industry.

On the list of AMSTEC's "integrated stakeholders" are corporations such as Michelin North America, Alabama Blue Cross Blue Shield, Alabama Power Company and Boeing.

Michelin spokesman John Tully, in a recent visit to Tuscaloosa, said business and industries' interest in math, science and technology partnerships is not because they want to tell schools how to teach, or even because it's the "right thing to do" as a corporate citizen.

"Very honestly, we need to get something out of what we do. We want to have a work force," he said.

Tully said 40 percent of U.S. workers don't have the math and science skills needed to contribute to the work force, and industries spend \$62 billion each year to upgrade basic employee skills.

The federal government has been forced to extend visas for foreign workers because many U.S. corporations can find no one else qualified to do the job, he said.

Boeing spokeswoman Tina Branch said the company became involved in AMSTI in the Huntsville region because math, science and technology are part of its strategic focus.

"We're fortunate here in Huntsville," Branch said. "We have more PhDs per capita than any other place in the country, and the average median income is the highest in the state.

“But what is phenomenal about AMSTI is it will bring those objectives into areas like the Black Belt. And if we can get this into every area, just think what that would do for the state.”

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