Applying Educational Technology to Increase Student Achievement in Mathematics.

Success of Canton City Schools – an Urban District

Canton City School District (CCSD) in northeast Ohio is one of the state's eight largest urban districts with a growing percentage of minority and economically disadvantaged students.

The Obstacles

With their standardized test scores falling below the statewide average, Canton's four middle schools were on the state's remediation lists. Needing to turn around this downward trend, Canton re-evaluated their middle school mathematics program and implemented a two-year initiative to increase student achievement, especially in mathematics.

The Solution

Working closely with Ohio Congressman Ralph Regula, CCSD was able to secure federal grant funding in 2004 to form The Genesis Mathematics Project, an intensive program that initially involved three of its four middle school math departments.

During the 2004-2005 school year, educators at the three middle schools had the option to participate in the pilot program, which involved changes in instruction, increased professional development and collaboration, and the integration of educational technology from Texas Instruments.

"We were blown away by the results. Students who used TI's graphing calculators along with the TI-Navigator™ system achieved at a higher level than students who did not."

Pam Bernabei-Rorrer
Canton City Schools District Math Coach

"(The technology) leads to a perfectly wonderful re-teaching moment in the span of minutes as opposed to what might take days or even weeks. It is of great value with regard to assessment."

Ed Rehfus
Crenshaw Middle School Principal

"If I have this tool at my fingertips, I can make decisions immediately in the classroom. I know exactly what I need to discuss to make my students better."

Jim Pukys
Crenshaw Middle School Math Teacher

"It has helped me so much, and my confidence in math has gone up a great deal."

Sharina
Hartford Middle School Student

The technology put into the classrooms included TI-84 Plus Silver Edition graphing calculators and the TI-Navigator™ classroom learning system, which enables the teacher to wirelessly communicate with students' calculators to allow close monitoring of each student's progress during class.

"We were blown away by the results," said Pam Bernabei-Rorrer, Canton City Schools District Math Coach. "Students who used TI's graphing calculators along with the TI-Navigator system achieved at a higher level than students who did not."

The Results

During the 2004-2005 academic school year, research conducted by Kent State University's Bureau of Research Training and Services to examine growth in student's knowledge indicated that those students who used the technology scored higher than those students who did not use the technology. In addition, the difference in mean scores between the two groups grew over time, further suggesting the technology had a positive impact on student learning.[1]

Also during the pilot year, changes in students' scores on the statewide Math Achievement Tests showed a higher percentage of the 8th grade students using the technology scored in the advanced range with fewer scoring in the below basic range, compared to students who were not using the technology.[2]

By the end of the second year of evaluations, with all four middle schools implementing the program, 7th and 8th grade student test scores on the statewide math test were up in all four schools – with 8th grade scores nearly doubling at two of the schools.[2]

Not only has the TI-Navigator system helped to better engage more students in learning and increase performance, but according to Bernabei-Rorrer "it has also provided us with valuable data which has been driving our instruction here in the middle school."

* See *education.ti.com/research* for more information.

1 Evaluation Report for the Canton City Schools Genesis Project. Kent State University Bureau of Research Training and Services. 2005

2 Based on school-level scores reported on the 7th and 8th grade Ohio Math Achievement Tests, comparing 2004, 2005 and 2006.