Broward County Public Schools
Ft. Lauderdale, Florida

**DimensionM Helps BCPS Students Learn Both Math Skills and Technological Proficiency**

“One of the first things I used to do in Algebra II was rote memorization of square roots and perfect squares. Some students had dynamite memories and some wouldn’t do the memorization homework. One of the great benefits of games like DimensionM is that the kids now gain the rote tracks they need to know through gaming.”

James “Duke” Chinn, Middle School Math Supervisor
Broward County Public Schools

**Profile**

Broward County Public Schools (BCPS) is the sixth largest public school district in the nation, serving more than 255,000 K-12 students in 284 schools. Approximately, 44 percent of the students are eligible for free or reduced lunch. In 2008, the district’s performance on the Florida Comprehensive Assessment Test (FCAT) math tests included proficiency scores of 59 percent, 65 percent and 69 percent for grades six, seven and eight, respectively.

**Situation**

Algebra often proves to be especially challenging during the middle school years, and quite often middle school children become turned off the subject because they view it as so difficult. Teachers asked James “Duke” Chinn, middle school math supervisor for BCPS, to look for a way to improve student motivation.

Coincidently, Chinn was also in search of ways to help students retain facts about algebraic elements such as square roots and integers. This would help develop student fluency and so increase the speed at which they could arrive at a solution. He had come
up with the idea of increasing the “fun factor,” and thus student engagement, by having students simultaneously call out answers to questions that he posed. However, he was always on the lookout for new ideas.

Solution
Chinn and Guy Barmoha, the elementary school curriculum supervisor at BCPS, first encountered the DimensionM immersive math games at the 2008 National Council of Supervisors of Mathematics (NCSM) annual conference in Salt Lake City. “We sat in on a Tabula Digita presentation and thought it was one of the coolest ideas we’d ever seen,” said Chinn who is an XBox player. “We knew it’d be motivational. The kids would want to play it. It was a no-brainer,” added Barmoha.

The decision to bring the games to Broward County began with an extensive internal review process, complete with testing and product demonstrations by Steven Hoy, Tabula Digita’s vice-president of institutional sales & business development. At the start of the 2008-09 school year, BCPS implemented DimensionM in 24 middle schools.

During the implementation, Chinn and Barmoha first trained a teacher and a technology liaison from each school to be the leaders for introducing the games at each building. As a follow up, the teachers and liaisons arranged assemblies for the initial presentation of the games.

“We figured that with teacher-only introductions, some teachers would take off with it while others would neglect it,” said Chinn. And although classroom teachers were present, Barmoha and Chinn made sure that the sixth, seventh and eighth graders were present and would see them play against each other and even participate. “To have teachers watch kids respond to the demo was one of the most powerful things I have ever seen,” stated Chinn. “The kids went nuts, so we said, ‘Bug your teachers about it.’”

The assemblies also helped Chinn combat the stereotype of girls not being interested in video games. “Some teachers would say, ‘My girls don’t want to play this.’ So we’d ask the girls if they wanted to play the games, and their response was ‘Absolutely.’ It was a nice thing for teachers to see students’ response before they shot down the idea,” he reported.
Each assembly was about 45 minutes long, but sometimes Chinn and Barmoha had to spend an entire day at a school so that they could conduct demonstrations for math classes in each period. The demonstration schedule depended on each school; some arranged assemblies for an entire grade at once, while others sent each class along at their scheduled math period. Chinn noted that the schools that did assemblies ended up using the games more than the few that didn’t.

Some schools, such as Olsen Middle School, did their own demonstrations. “The seventh and eighth grade teachers put together a couple of students, three to four computers and an LCD projector in the cafeteria,” recalled Melissa P. Sherman, a sixth grade teacher. After showing the games, the teachers explained to students that they could also download the games at home. “We also gave the kids a flyer with the Website and login information for their parents to review,” said Sherman.

After all the assemblies, Chinn and Barmoha provided five or six more training sessions for the math teachers. With the help of a Tabula Digita representative they went out to the schools for training, tech support and to encourage the schools that were using the games less regularly than the others.

**Teacher Benefits**
The schools’ teachers range in age from 21 to 65 years, and while some were experienced gamers who jumped headfirst into the task of integrating DimensionM as a teaching tool, others were hesitant about the video games. “We anticipated a major challenge from seasoned math teachers who were averse to the idea of video games as educational tools,” stated Chinn. “We told the reluctant ones that they didn’t have to be experts, they just had to point the kids in the right direction,” said Chinn.

Sherman was one of the teachers who took that advice to heart. She said, “I took training on a Tuesday and the very next day I introduced it to my students. I’m really big on it.” Like many of the non-gamer teachers, Sherman often uses the software as a reward or for motivation.

However, even as a motivational tool, the games had a significant impact. Teachers have told Chinn that there has been a huge change in student engagement, saying things like, “I cannot believe how hard my kids work to be allowed to play.” Barmoha
himself witnessed the phenomenon when he tutored students. “These kids would fly to tutoring because it would start off with five- to 10-minute game sessions,” he reported.

**Student Benefits**

While Chinn did away with the stereotype that female students would not want to play video games, a few teachers reported that some of their girls initially shied away from the competition inherent to multiplayer games. Those students preferred working on math strategies and calculations via the DimensionM single-player games. Once they became comfortable with playing the solo player games, the girls enthusiastically moved on to the multiplayer versions.

Another benefit for many BCPS students was that the games were an enjoyable way for them to get acquainted with technology. Olsen Middle School, for example, is a Title I school, and teachers often found it difficult to get students up and running in terms of technology proficiency since many of the children either did not have home computers or had only older models. By playing the games, they could become used to using a keyboard and a mouse without worrying about more complicated issues like drop-down menus.

The video game that Sherman’s students played most was the multiplayer game, Swarm. In addition to arranging themselves in teams and playing against each other in the same room, students can play against other schools. Sherman employs the game not only as a hook but also as reinforcement or extra practice. “If the kids are still struggling with the least common multiple or greatest common factor concepts, we use Swarm as remediation.”

“For a lot of students who have not been successful at math, their confidence takes a beating,” Sherman continued. “Half my job is dealing with those mental obstacles. In these games, though, you can be divided down to the lowest denominator but that doesn’t mean the end of the game for you. That allows my students to take risks in a safe learning space. You can get back on and keep trying. That mindset is so powerful.”

Overall, the students have had a significantly improved attitude toward math. Also, the multiplayer games such as Swarm have honed teamwork skills because the teams have
to discuss strategy. Sherman has heard students telling each other, “I’ll take this node and you go ahead to the next.”

After completing the FCAT, students prepared for an inter-county tournament in which teams of students competed using the games. The daylong event was held on May 21, 2009 with teams of five players from each of the 24 schools (some schools had two teams) competing for prizes such as a Nintendo DSi portable game system and iPod Shuffle provided by Tabula Digita.

Results

Later in 2009, the teachers will be encouraged to use game content that was recently added as remediation. And like many of her colleagues, Sherman is planning to make the games a more integral part of her lessons as the year continues. Likewise, Chinn is making arrangements for the games to play a huge future role in helping teachers provide more in-depth instruction.

In addition, BCPS will be expanding its use of DimensionM in 2010 by implementing age-appropriate games in its elementary schools.