

Teacher Sees Results in First Year Moving to TI-Nspire™ with New NY State Curriculum

Case Study 36

Teacher/Researcher – Audrey Cucci, Frankfort Schuyler High School, Frankfort, NY



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Teacher/Researcher	Audrey Cucci
Location	Frankfort-Shuyler High School, Frankfort, NY
Course	Algebra II + Trigonometry
Grade	11
Student Profile	Low SES, low achieving, predominantly white native English speakers; Special needs students included under 12-1-1 plan
Technology	TI-Nspire technology with TI Connect-to-Class™ Teacher Software

“TI-Nspire technology made possible a whole new way of teaching with major improvements in performance on the new NY State Regents exam.”

Setting: Frankfort-Shuyler school district is small (total enrollment of 1,200) and I teach math in the high school. There are 23 females and 24 males in the class. The students are mostly white, with low SES and little home support. My classes also include special needs students in the 12-1-1 plan, with an aide. Students don't purchase their own handhelds, but most have cell phones and iPods. Their computer access is at home or in the school library, and they download the link software for free.

Curriculum & Teaching: This year, New York State transitioned to new math standards and a new curriculum and assessment system. For 11th Grade, the change was from Math B to Algebra 2 and Trigonometry.

When my school planned the transition, I proposed that rather than spending funds on new textbooks, I would rather purchase a class set of TI-Nspire handhelds and use no textbook at all. The whole year was paperless: all assignments, handouts, quizzes and tests were in the form of .TNS files which I prepared and distributed to students, then collected and graded. Students could take notes in their own notebook if they wanted and some did. I was able to make big changes in my teaching and the district saved money on textbooks and copying.

The students are issued their handhelds for the year and can take them home. In addition, I videotape every lesson and post the video and accompanying .TNS file on the class website, so students can refer to it after class and at home. This has proved so effective that two of my students who had long-term medical absences this year were able to keep up with the class and turn in their assignments on time.

I find that a paperless classroom actually saves time because everything is more organized. When students come in to class, they just download the day's .TNS files and settle in to work. There's no lost time distributing and collecting worksheets, handouts and assignments. I collect their assignments through TI Connect-to-Class, and I can quickly click through, grade and return them. It's much more efficient than shuffling papers and nothing gets lost. It takes me no more time to prepare the .TNS files than it did to prepare worksheets in Word last year. I gave students the option of using paper instead if they preferred and a couple of students did.

This created a very different learning environment from last year. I was able to move from teacher-centered lecturing and guided notes to student-centered discussions which challenge the students to make sense of the math. Most lessons are built around .TNS files in the action-consequence document format, which gives the students a mathematical object to play with, observe and discuss. The questions to think about are also in the files I distribute at the beginning of the class. All I have to do is ask questions to help guide the discussion. I rarely have to explain anything – the kids really want to figure it out on their own. If you give them enough time, they grasp it.

This was a big transition for the kids. I have really high expectations for them in terms of engagement and responsibility for their work. I've found that time on task has gone way up because the kids know they have to stay with it if they're not going miss something. And they prefer figuring it out on their own - you can't tell them anything anyway.

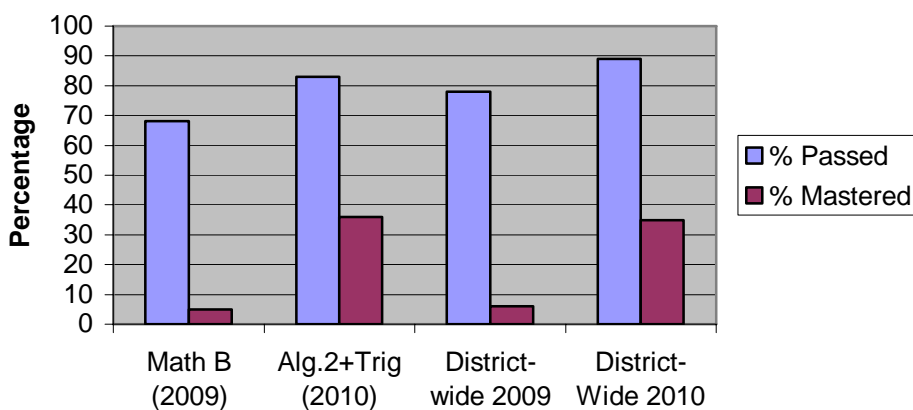
In addition to teaching the new curriculum, I found that I had to re-teach most of Algebra 1 (Integrated Algebra). In spite of this, we were able to cover the entire year's curriculum because it's so much more efficient to emphasize teaching for deep understanding of concepts. Once the kids understand the core concepts everything falls into place and the additional content develops much more quickly than with conventional teaching methods. It's definitely worthwhile not to rush and give the kids the time to really develop their own understanding.

My 12-1-1 (special needs) students had no trouble with the new way of teaching. They found it just as engaging and just as effective in building understanding as the other students.

End of Year Results:

The new NY State Regents Exam is definitely *not* easier than the old one. With all the changes, my classes showed a substantial improvement this year. The chart below shows last year's and this year's Regents pass rate and mastery rate. It is clear that there is a big change in my class pass rate and mastery rate. District-wide 9th grade performance also improved this year, as did 10th grade performance (not shown in the graph).

NY State Regents Exam Results



It's also interesting to note that my grading system is based solely on quizzes and tests, not homework. A few students actually exceeded my expectations for Regents exam performance based on their grades.

The chart does not pull out the performance of the 12-1-1 (special needs) students, but they also showed an improvement in pass rate.

Conclusions:

To summarize, in response to the new curriculum and tests this year, I made many important changes:

- From a textbook-based curriculum to no textbook, using .TNS files extensively
- From TI-84 graphing calculators to TI-Nspire learning handhelds
- From teacher-centered lectures to student-centered discussion
- Increased emphasis on deep conceptual understanding rather than “covering the content”
- Online access to all classes
- Paperless classroom

It's impossible to attribute the improvements to any single factor, though it couldn't have been done without the effective use of technology, especially TI-Nspire technology.

The results I saw were big improvements in engagement and on-task behavior, as well as improved achievement – all with a challenging student population in a district that is not affluent. All this was possible due to gains in efficiency, both in class and in my prep time.

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