

TI-Navigator Helps Differentiate Instruction for At-Risk Students

Case Study 40

Teacher/Researcher - Dan Kennedy
Project More HS, Tucson USD, AZ



Your Passion. Our Technology. Student Success.™

TI-Navigator Helps Differentiate Instruction for At-Risk Students

Case Study 40

Teacher/Researcher	Dan Kennedy
Location	Project More HS, Tucson USD, AZ
Course	Algebra 1&2
Grade	9-12
Student Profile	High proportion of at-risk and credit recovery students. Some on IEP, most on 504 plans: 55% Hispanic, 20% Native American, 10% African American 80% Free/reduced lunch.
Technology	TI-84 PLSE, TI-Navigator, interactive white board with smart slate

With a high-minority, low-income at-risk student body, TI-Navigator has become the backbone of a successful new way of engaging, high differentiated teaching of Algebra 1 and 2.

Setting: Project More High School was started as an alternative school serving at-risk and credit recovery students. It is now transitioning into a small high school (enrollment of 200 in grades 9-12). Students are predominantly minority and low-income, and most are at risk with 504 plans. A few have IEP's. This is a challenging student population to teach: gangs are present, attendance issues are common, and some students age out of the system without completing graduation requirements. Class size is under 25, but only about 15 attend on a typical day. Most students are low-functioning, with a prior history of failure in math, and a few are high-functioning students who easily get bored waiting for the rest of the class to catch up.

Curriculum & Teaching: Mr. Kennedy works with students in the Math Center. This is a differentiated curriculum in 4 leveled classes, using the McDougal-Littell 2001 textbook for Algebra 1 and Algebra 2. Students use a 3-page "reader's digest" of the text, with answers available so they can check their work.

A similar Science Center class offers a differentiated curriculum using the 2008 Pierce-Holt Physical Science text.

Mr. Kennedy uses TI-Navigator as the backbone for his differentiated instruction. Students log in at the beginning of the period, and Mr. Kennedy takes a screen snapshot to instantly log the daily attendance. Instruction starts with a 3-question quiz on homework (about 30 seconds per question), instantly sent to students via Quick Poll or Learn Check. Then Class Analysis instantly displays the answers on the interactive white board, and the class discusses the questions. Based on the responses, Mr. Kennedy decides what to do next. He has a collection of additional quizzes using Quick Poll or Learn Check, and can use them to explore more deeply anything that is not clear.

Mr. Kennedy particularly likes using Quick Poll to work with the class on a wide range of answer forms, some right and some wrong, which the class can explore. For example, a question on order of operations yields a wide range of answer forms, and displaying them all challenges the

of the quick polls and puts them in his class notes. That way, he has a continuous running record of what works and what doesn't in each class, so he can look at them after class to identify gaps and decide what to do next. If a student isn't learning, he can document exactly why. He then can share this information with parents – simply by cutting and pasting into an email.

In small groups (except on exams), students work through the units in order. Each unit ends in a quiz (usually half multiple choice & half free response), and students can retake an alternate form of the quiz if needed. The quizzes are automatically administered and the multiple choice questions are immediately scored by TI-Navigator. Quiz retakes get half credit.

Mr. Kennedy particularly likes his ability to roam the class, working with each small group and individual students, while he wirelessly uses the smart slate to control the display at the front of the room. "If I stand at the front of the room and lecture, the kids pop out their cell phones!" he observes. The highly interactive way of running the class, where every student answers every question using TI-Navigator, really helps with student engagement, he reports.

Mr. Kennedy is in his fifth year of teaching with TI-Navigator, and he never wants to go back. "It's a quantum leap." he says, "It makes your job easier, not harder. You have to create the learn checks in advance, but it's worth it. I was amazed at how much I learned about my students. All of your students are getting feedback all the time, instantaneously, effortlessly. Once you've invested the effort in setting up initial quizzes and exams, then changing them is easier. Grading is no work." He also emphasizes that it's important to learn how to enter answers so they correspond to how the learn checks are set up.

By contrast, Mr. Kennedy says that accessing student data from district is very inconvenient: he has to go to the computer lab and use a unique login. However, the TI-Navigator system is available in real time in class.

Mr. Kennedy offers this tip: "If you are doing differentiated instruction, take a snapshot of the student's performance, cover up the correct answers and add the student's answers. This gives immediate feedback. It saves huge amount of time, because there is no grading. Partial credit is easy. And, you quickly discover what you didn't teach successfully. Encourage your students to learn from each other – emphasize team spirit. If most kids got a question right, you don't have to waste time on it. Focus on the ones which most kids had problems with."

Mr. Kennedy is now writing a grant proposal to purchase TI-Nspire and TI-Nspire Navigator. He's looking forward to the many advantages of the newer technology, but he's particularly interested in Presenter Mode, which will allow any student to show work on the screen.

Last year, TI-Navigator also played a role in a supplementary review class before the state AIMS test. All the students who had failed the test were assigned to the review class. The class focused on concepts & standards which didn't require a lot of prior knowledge. The class used TI-Navigator to pretest every student on Monday, then the rest of the week included intensive instruction, followed by a post test on Friday.

Results:

In the review class as a whole, success rate improved upon retaking the state test. One student passed the exam even though she had not finished Algebra and Geometry.