

Action Research Report #7

TI-Nspire™ CAS learning handheld helps Algebra II students visualize problems and make connections.

Teacher/Researcher:	Holly Thompson
Location:	Plano Senior High School, Plano, TX
Course:	Algebra II
Grade:	11
Student Profile:	27 students
Technology:	TI-Nspire CAS technology with projector

Setting:

Plano Independent School District is a Texas Recognized District with many Exemplary schools and national awards. Plano Senior High School holds the state's Recognized status and has twice been awarded the National Blue Ribbon School award. It has more than 2,700 students that consist of 68% Caucasian, 10% Hispanic, 7% African-American and 9% economically disadvantaged.

Curriculum & Teaching:

Ms. Thompson uses a district-written curriculum for Algebra II -- without use of a textbook. The curriculum incorporates a significant amount of real-world context. Word problems are a component at least four class days during each week, including all views of a function. At times, Ms. Thompson will break the class into subgroups. The class meets for daily 50-minute periods. All of the planned curriculum was taught in the course of the school year.

The assessment system is based on full-period, end-of-unit tests written by teachers. Final exams are district-written, include 44 questions and require two hours to complete. The grading system is based 75% on tests and 25% on homework.

In a typical week, students use TI-Nspire CAS technology daily to check and compare answers, and to discuss problem-solving strategies. In most weeks, students use the TI-Nspire CAS handheld to generate examples of new concepts or to make predictions. Ms. Thompson reports that on a typical day, her questioning is a mix of instructions for operating the handheld, answer checking, discussion of reasons for different answers, problem-solving procedures and reason/justification questions. The class frequently uses representations of equations, graphs, and tables and verbal problem statements on the handheld. However, simultaneous multiple representations (viewed on screen) and TI-Nspire document features are rarely used.

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Results:

Ms. Thompson sees advantages for students in the way the TI-Nspire CAS technology connects together applications, and in the way the handheld allows students to write mathematics in the same way they will see it on screen. She gives this example of the way her class uses multiple representations with TI-Nspire CAS technology:

We used this (multiple representations) while exploring polynomial applications. We put data in the spreadsheets and used the regression feature to create models. We then looked at the graphs of the data and the model, and did a graphical analysis by finding intercepts and minimum values and maximum values.

She also found that students were able to save files (TI-Nspire CAS documents) they created in class, so they could refer back to them later for review of class work. Many students used this TI-Nspire CAS capability more than once, she reports.

Ms. Thompson comments, "I think students will learn TI-Nspire CAS technology faster than they will other (graphing) calculators since it is built more like a computer." However, she estimated that reaching full classroom proficiency with the device took approximately 36 weeks.¹

She believes teachers will find TI-Nspire CAS technology "more beneficial than what they are using now." However she noted that the state TAKS test does not currently allow use of the CAS subsystem.

(June, 2007)

¹ This study was conducted with pre-release versions of the user interface.