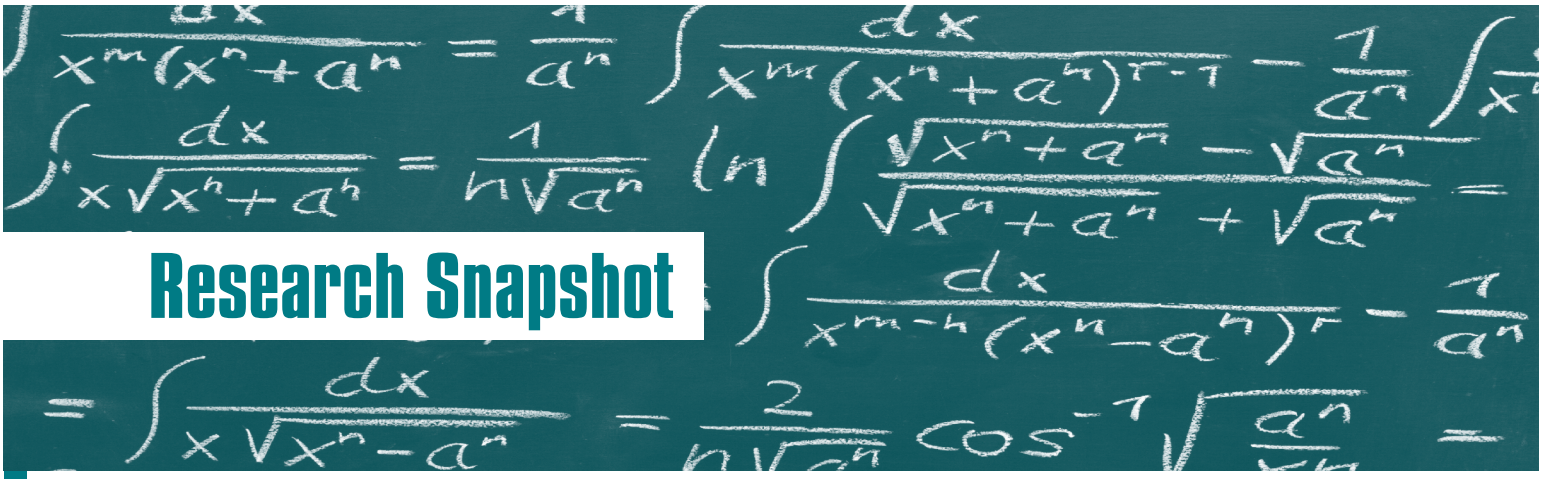


# Research Snapshot

# Math-in-CTE Study

## Research Summary

The Math-in-CTE research study, conducted by the National Research Center for Career and Technical Education (NRCCTE), tested a model of curriculum integration to improve CTE students' mathematical understanding. CTE teachers were drawn from agriculture, auto technology, business/marketing, health, and information technology. Each of the CTE teachers was paired with a math teacher from his or her local school, district, or community. The CTE-math teacher teams within each of the occupational areas were brought together for extended professional development — 10 days over the course of an academic year — to learn the process and pedagogy of the Math-in-CTE model. The teams began the process by examining the CTE curriculum in order to identify embedded mathematical concepts (curriculum mapping). Utilizing a seven-element pedagogic framework, they then developed CTE lessons to enhance the mathematics that existed within the occupational curricula. The CTE teachers scheduled and taught each of the math-enhanced lessons throughout the school year.

The study was conducted with random assignment of CTE teachers to the experimental and control conditions within each occupational area. A total of 136 CTE teachers and more than 3,000 students took part in this study. Fifty-seven teachers were in the experimental group and 74 were in the control group. Recruitment and random assignment were conducted at the teachers' classroom level rather than at the individual student level. Assignment at the classroom level distributed any unmeasured factors that may have affected the outcome measures randomly across classrooms and allowed unbiased comparisons of the experimental and control group performance.

After one year of exposure to the math-enhanced lessons, the students in the experimental classrooms performed significantly better on TerraNova and Accuplacer, two of the three math posttests administered. On the TerraNova test, the average experimental class scored at the 71st percentile of the average control-group class. On the Accuplacer test, the average experimental class scored at the 67th percentile of the average control-group class. Both findings represented statistically significant differences between students who received instruction based on the Math-in-CTE model and those students who received the regular CTE curriculum.

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NRCCTE National Research Center for Career and Technical Education

Data from focus groups, surveys, observations and teaching reports were also collected and analyzed to determine what worked in the intervention and what did not. From analyses of multiple sources of data, these five core principles were shown to be essential to implementation of the Math-in-CTE model:

1. Develop and sustain a community of practice.
2. Begin with the CTE curriculum and not the math curriculum.
3. Understand that math is an essential workplace skill.
4. Maximize the math in the CTE curriculum.
5. Recognize that CTE teachers are teachers of Math-in-CTE and not math teachers.

The results presented in this report were achieved without the need for exemplary school-based leadership or cultural change within the school, as opposed to what is commonly concluded in the school reform literature. Instead, the improved math performance of the experimental students was produced by assembling teams of teachers in a single occupational area across multiple schools and providing them with a process and a pedagogy through which they could successfully enhance the math in their own curricula.

If you are interested in reading the full report of the Math-in-CTE study (titled *Building Academic Skills in Context*) please log on to the NRCCTE Web site at: **www.nrccte.org**. If you are interested in learning more about Math-in-CTE technical assistance, please submit your request to Dr. Donna Pearson by e-mail to **donna.pearson@louisville.edu.**

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