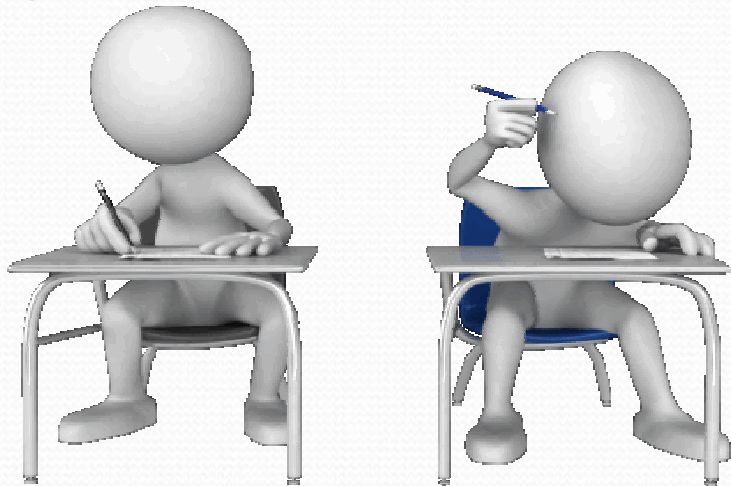


Maximizing Academic Opportunities for Students in CTE Programs

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The Context: Since the mid-1980s we have:

Added the equivalent of *one full year* of core academics (math, science, language arts) to high school graduation requirements.



- (NAEP) *Reading scores have remained unchanged*
- (NAEP) *Science scores have remained unchanged*
- (NAEP) *math scores have remained unchanged*

15 year olds in the US on the PISA:

- Performed below average in mathematics in 2012 and is ranked 26th among the 34 OECD countries
- Showed no significant change in this performance over time.
- Have particular weaknesses in performing mathematics tasks with higher cognitive demands, such as taking real-world situations, translating them into mathematical terms, and interpreting mathematical aspects in real-world problems



HOT OFF THE PRESS!!!!

Taking more math is no guarantee

- Only 26% of students who took Alg I, II & Geometry scored a 22 (ACT Benchmark) on the ACT exam scoring an average of 17.7¹
- Adding Trig increases to the average score to 19.9¹
- Not until calculus is added, does the average score exceed 22 – 5 years of high school math.
- 43% of ACT-tested Class of 2005¹ who earned A or B grades in Algebra II did not meet ACT College Readiness Benchmarks in math²

1. ACT, Inc (2004) *Crisis at the Core*

2. ACT, Inc. (2007) *Rigor at Risk*.

Curriculum Integration Research

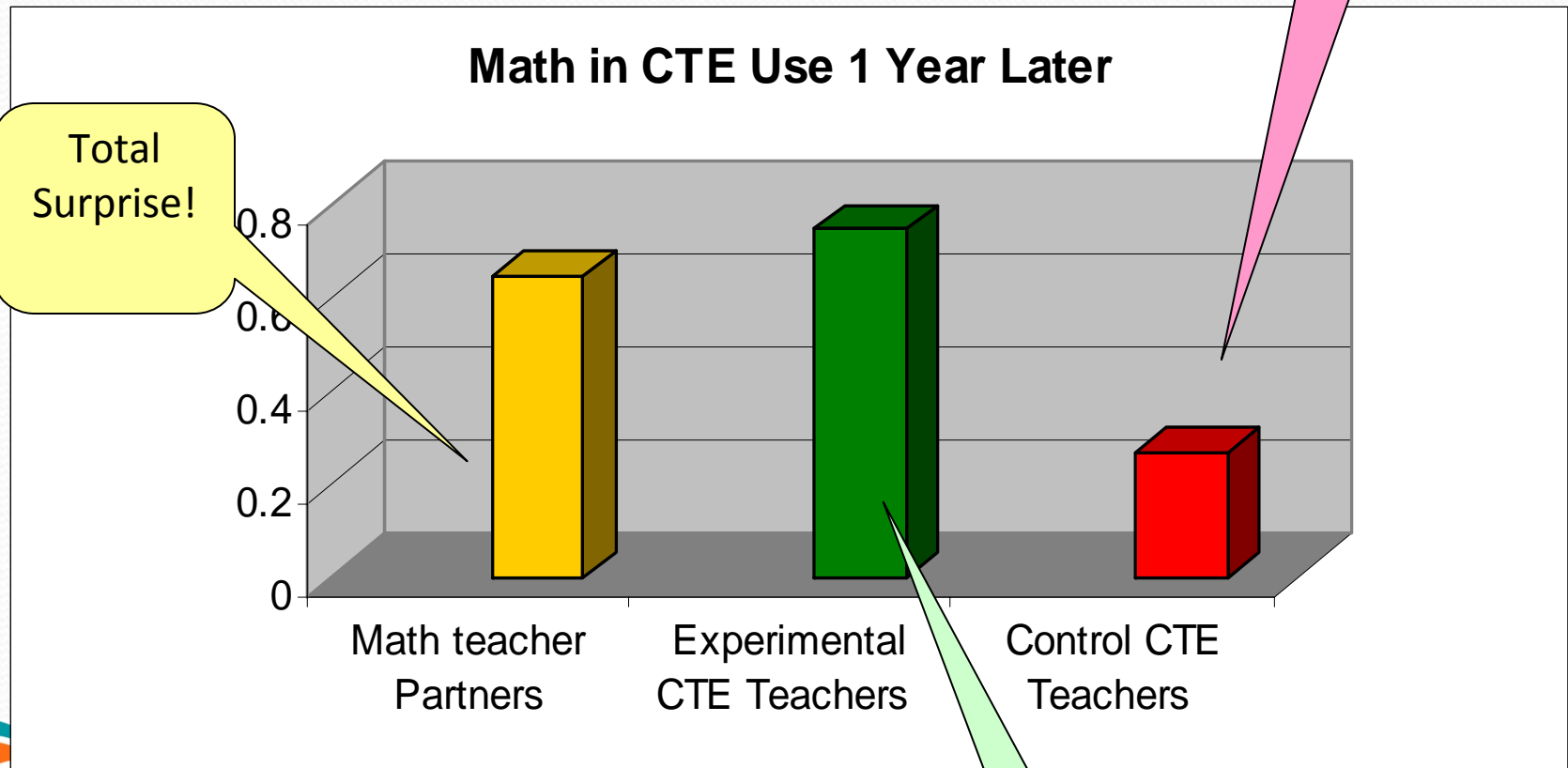
- Math-in-CTE: complete
 - Technical Assistance
- Literacy-in-CTE: complete
 - Technical Assistance
- Science-in-CTE:
 - Study recently concluded

Math-in-CTE: What we found

- Students in the experimental classes scored significantly higher on Terra Nova and Accuplacer
- The effect: 71st percentile & 67th percentile
- No negative effect on technical skills
- 11% of class time devoted to enhanced math lessons



Power of the New Professional Development Model



New Model PD

Old Model PD

Total Surprise!



- Significant improvement from both approaches
- Teachers with two-years experience in method had greater effect

Experimental Test of Reading Interventions in CTE

(Authentic Literacy study)



What We Learned: Science-in-CTE

Experimental Test of Science Integration

- Pilot intervention improved science achievement of students in the second, third, and fourth quartiles
- Full Study: Overall, no effect
- However, significant effect for nonwhite males and females

