

## Questions that Inspired our Work

### What are the characteristics of a powerful classroom?

- High Structure
- High Challenge
- Intensity
- Intentionality and Learning How to Learn
- Inquiry and Assessment to Make Learning Visible

*Basic Skills for Complex Lives: Designs for Learning in the Community College: A Report from Strengthening Pre-Collegiate Education in Community College (SPECC). Stanford, CA.: The Carnegie Foundation for the Advancement of Teaching, 2008*

### What activities in a mathematics classroom lead to effective learning of mathematics?

- Connections: Making mathematical relationships-among concepts, procedures, and ideas explicit in the lesson
- Struggle: Students spend at least some time in class struggling with important mathematical concepts and procedures

Hiebert, J., & Grouws, D. (2009). Which teaching methods are most effective for math? Better: Evidence-based Education, 2 (1), 10-11

### What are the actual struggles of students who place into pre-college math classes?

- Students experience persistent conceptual confusion
- Students are not usually asked to share their thinking about mathematics
- Conceptual Thinking Atrophy Hypothesis

Stigler, J., Givvin, K., Thompson, B. (2010) What Community College Developmental Mathematics Students Understand about Mathematics. *MathAMATYC Educator*, Vol. 1, No. 3.

### What experiences might shift students' mindsets about themselves as math learners?

- Accessing, seeking out, and succeeding at challenging tasks (Mastery Tasks).
- Viewing failure as a temporary condition and as an opportunity for growth.
- Reflecting on current confidence around achieving a task and seeking out strategies to improve confidence and ability.

Bandura, A. (1997b). *Self-efficacy: The exercise of control*. New York: W.H. Freeman

Schunk, D. H. (1981). Modeling and attributional effects on children's achievement: A self-efficacy analysis. *Journal of Educational Psychology*, 73(1), 93-105

Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York: Random House.

Yeager, D.S. & Walton, G. (2011). Social-psychological interventions in education: They're not magic. *Review of Educational Research*, 81, 267-301