



Rochester Area Colleges
CENTER for EXCELLENCE
in MATH and SCIENCE
Collaboration-2008

October 1-2, 2008

Charles S. Brown, Jr.
Executive Director

Event's Purpose

- Provide an update on the Center's first year and to provide insight of what lies ahead.
- Recognize and Celebrate Excellence in STEM education.
- Share national and local best practices in STEM education.
- Continue the formation of a "Community of Educators" committed to significant improvement in Science Technology, Engineering and Mathematics (STEM) education.



Did you know about the “Silent Crisis”?

- 1/3 of all practicing scientists & STEM teachers are retirement eligible.
- Although improving, U.S. students under-perform in STEM subjects compared to other countries.
- Women, people of color and people with disabilities are severely under-represented in STEM jobs.
- Nationally too few qualified K-12 STEM teachers.
- STEM education “pipeline” is very leaky.
- Other countries are out producing the U.S.
- **The future U.S economic growth and national security is threatened by the quantity and capability of the emerging math and science trained talent pool.**

About the Center

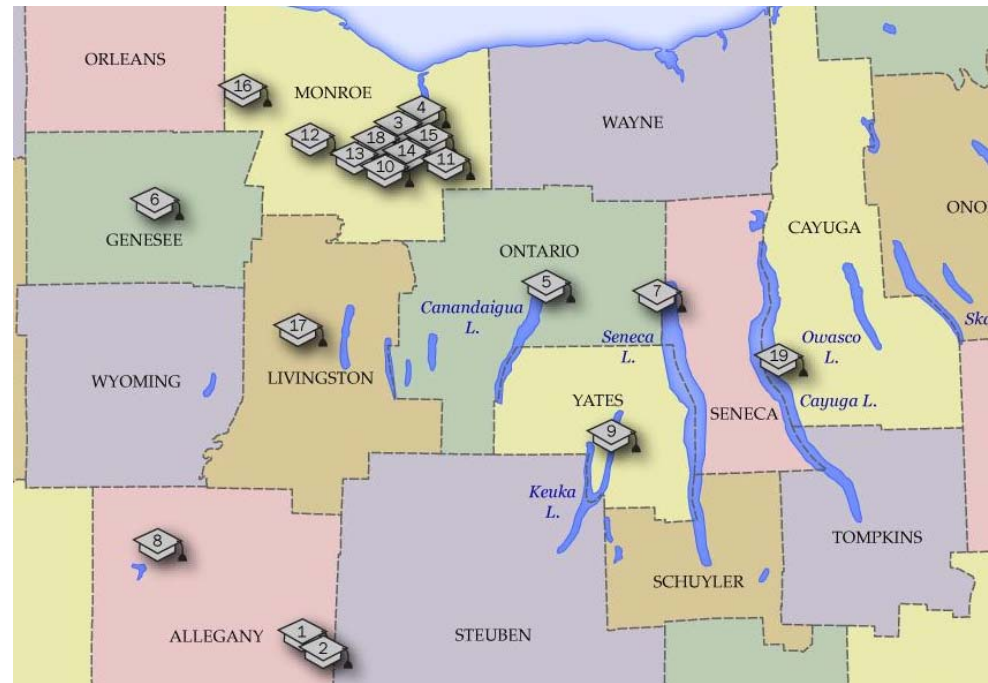
- Created in February, 2007,
 - leverage Rochester Area Colleges’ resources in addressing the “Silent Crisis”.
- Funded by \$500K from NYS and recently \$950K from U.S. Dept of Education.
- Charged to work with K-12 teachers and K-16 students.

Rochester Area Colleges

- Consortium established in 1970.
- 19 members including:
 - 12 private colleges and universities;
 - 7 public institutions including:
 - 3 community colleges.
- Located in urban, suburban & rural areas of west central New York.

About the RAC Service Area

- Counties = 10
- Districts = 82
 - 1 Urban
 - 17 Suburban
 - 64 Rural
- Students = 200,000+
- Teachers = 16,000+
- Estimated STEM Teachers = 1600



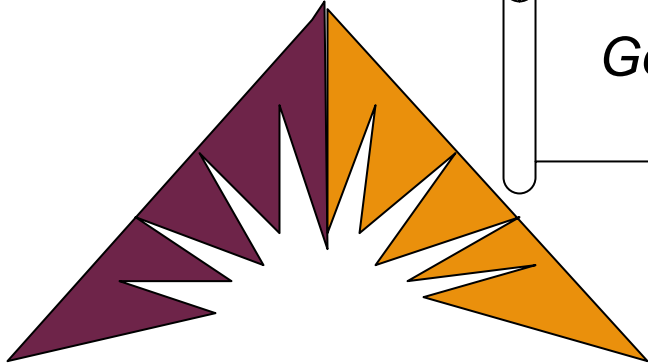
Vision:

The Rochester, New York, region is nationally recognized for innovative and effective education of young scientists, engineers, and mathematicians
and
their teachers.



Initial Teacher Focused Strategy

Good..... → Great



More Teachers

Supply ← ? → Demand

Acquisition

Retention

Better Teaching

Today's Teachers

Tomorrow's Teachers

Measurement System

Community of Educators

Great Teachers?

Today we know
them by their actions.



Tomorrow we want to
know them also by their
students' outcomes.



Great Teachers- Known by their actions

- Know the content of their subject.
- Demonstrate the practical subject-specific pedagogical skills
 - Recognize that each student is at a different place and learning by a different pathway,
 - And able to adapt their teaching approach to maximize learning progress toward a clearly defined achievement-based goal.
- Are passionate and inspire their students.

But there is more!

Greater Teachers- Known also by Students' Outcomes

- Able to annually progress all students within their class
 - Regardless of starting point,
 - To a higher performance level,
 - At an acceptable rate,
 - Measured against achievement-based performance standards.
- Produce students who are able to think differently about a subject.
- Produce students who are motivated to continue to educate themselves.

More STEM Teachers



- Supply $\leftarrow ? \rightarrow$ Demand
 - Forecasts by:
 - Discipline
 - Grade level
 - Monitoring of:
 - Student demographic shifts
 - Teacher demographic shifts
- Acquisition
 - Market STEM teaching among high school students
 - Increase STEM education concentration/majors via traditional pathways
 - Facilitate non-traditional educational pathways while maintaining quality standards
- Retention
 - Raise the professional stature of STEM teachers
 - Self perception
 - Administrators' perception
 - Communities' perception
 - Enhance early career STEM teacher support systems.



Better (Great) STEM Teachers

- Today's In-service Teachers
 - Increase the STEM competence/confidence of elementary school teachers.
 - Enhance the inquiry-based pedagogical skills of middle and high school teachers.
 - Promote staying current in content fields.

Better (Great) STEM Teachers

- Tomorrow's Teachers



- Critically evaluate effectiveness of current STEM Teacher Education processes.
- Employ effective regional/national programs.
- Model effective pedagogy in STEM content and education courses.

Accomplishments in Year 1

- Launched RACCEMS.org and The STEM BLOG.
- Developed and launched an initial teacher-focused strategy.
- Launched STEM teacher career marketing program
 - Today's Students Tomorrow's Teachers
 - East High School Teaching and Learning Institute.
- Held the 1st Annual Collaboration Event attended by 200 Rochester area educators.

Accomplishments Year 1 Con't

- Launched a “process trial” of a Visiting Scientist Program
 - In cooperation with RCSD, B&L, and Kodak.
 - Completed 3rd party evaluation.
- Sponsored “Value Added” evaluation mini-conference
 - Local administrators
 - Experts from Albany and Battelle For Kids (Columbus Ohio).
- Inaugurated the Excellence in STEM Teaching Award.
- Secured \$950K of additional funding with the help of Senator Charles Schumer.

What's Happening in Year 2?

- Successfully implemented STEM Teaching Institutes
 - Established quality standards for effective K-12 Teacher professional development,
 - Supported 6 programs developed and delivered by RAC and RMSC,
 - Undergoing 3rd party evaluation,
 - Expect to expand to 10 offerings in 2009.
- Modifying the Visiting Scientist Pilot
 - RCSD-CEMS “Fellow” funded and named,
 - Greater utilization of the Inquiry Institute,
 - Continued B&L and Kodak engagement,
 - Developing community STEM resource network.

What's Happening in Year 2?

- Continuing STEM teacher marketing program:
 - TSTT partnership at East High Teaching and Learning Inst.
 - St. John Fisher program for 30 students.
- Expanding Excellence in STEM Teaching Award.
- Supporting alternative teacher career pathways.
- Developing a strategic level evaluation measurement system.
- Development of a 2nd phase “Student-Focused” Strategy.

Student Focused Strategy Development

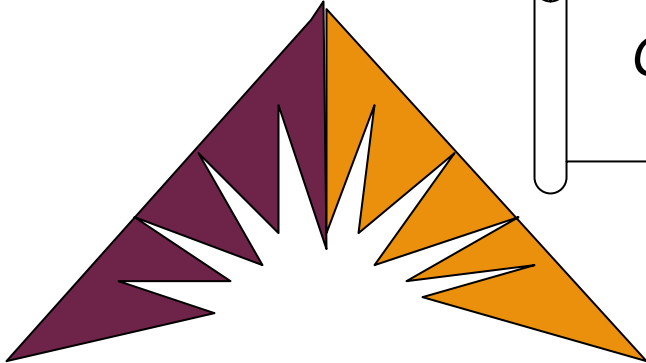
- What are the major factors affecting students' interest and engagement in math, science and technology?
 - What do educators believe?
 - What do students say?

We're going to discuss this during session A-5

We're going to ask them this fall.

Initial Teacher Focused Strategy

Good..... →..... Great



More Teachers

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Retention

Better Teaching

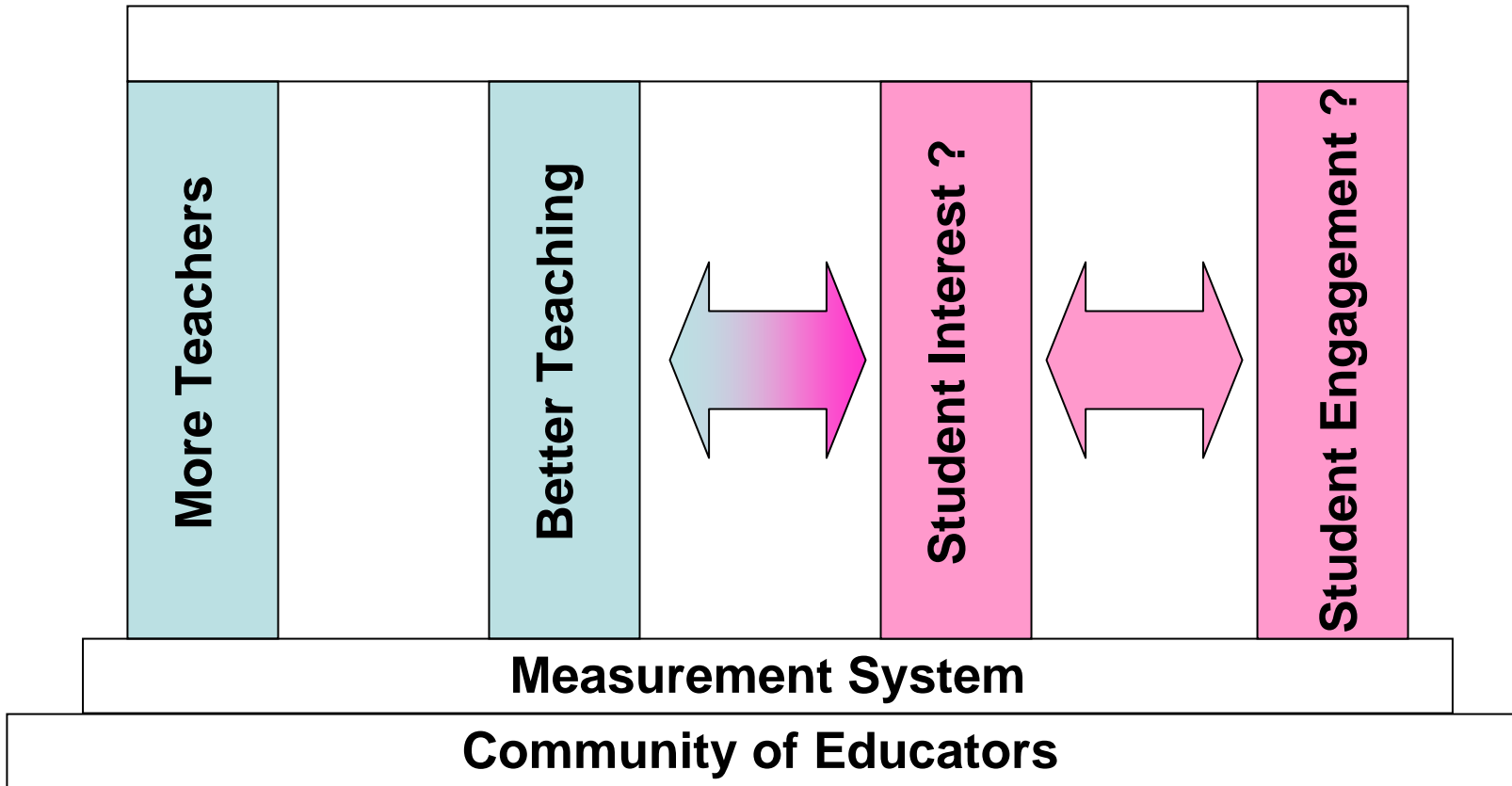
Today's Teachers

Tomorrow's Teachers

Measurement System

Community of Educators

Combined Strategy



Where do we expect to be a year from now?

- Strategic measurement process in place and baseline completed.
- Engaged in supporting 10 high quality STEM Institute professional development programs.
- Increasing support for elementary school teachers.
- Expanding Rochester Area Excellence in STEM Teaching Award program.
- Delivering student focused programs.

What will it take?

- Leadership
- Alignment
- Commitment
- Resources
 - People
 - \$'s
- Willingness to try new things quickly and to learn from them.
- Resolve to undertake and sustain a long journey

