CLEMSON UNIVERSITY

Center of Excellence in Mathematics and Science Education

College of Engineering and Sciences
Department of Mathematical Sciences

Ranked #22 among national public universities, Clemson University is a science and technology-oriented public research university that is known for its emphasis on collaboration, focus, and a culture that encourages faculty and students to embrace bold ideas. Its teaching, research and outreach are driving economic development and improving quality of life in South Carolina and beyond. Clemson is a high-energy, student-centered community dedicated to intellectual leadership, innovation, service, and a determination to excel.

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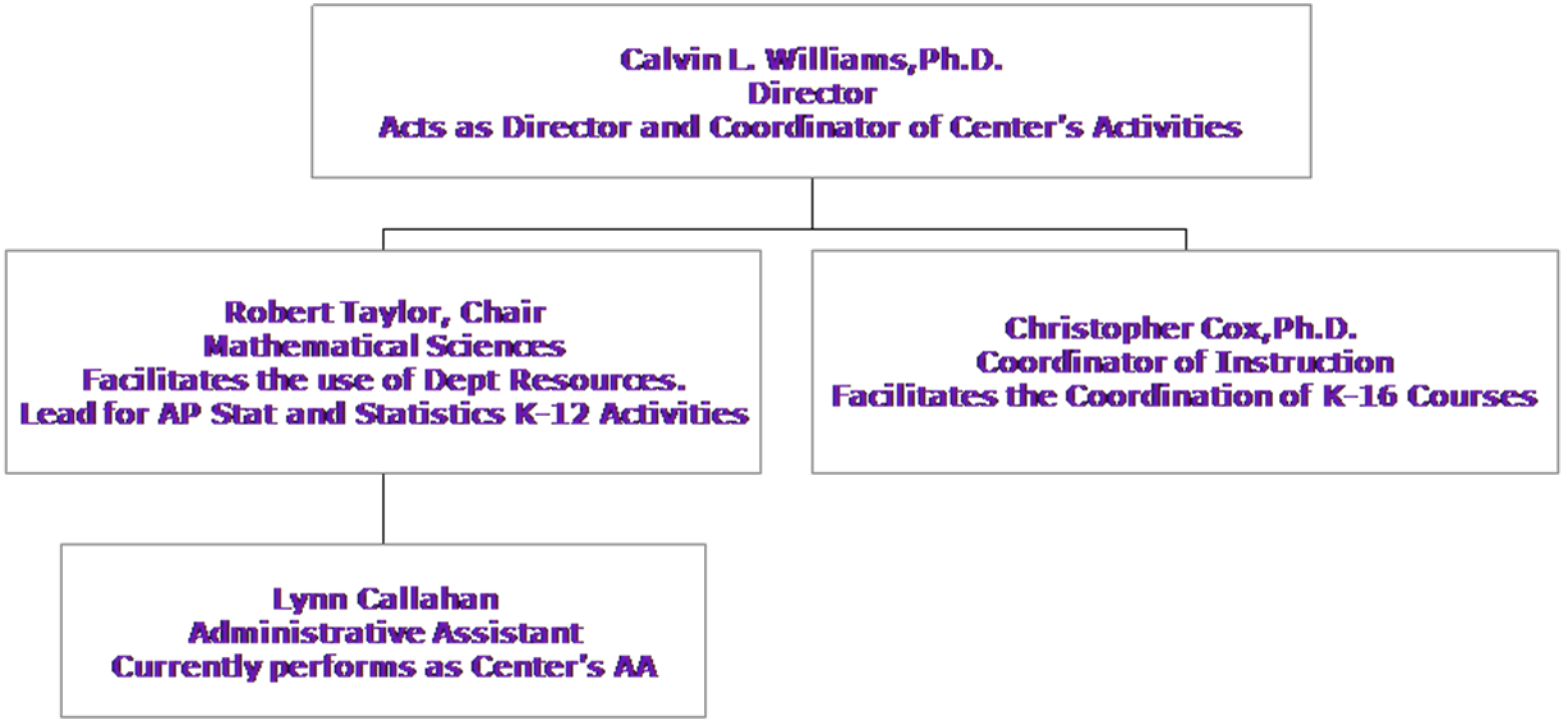
Organizational Structure



Established in 1986, the purpose of the Center is to provide support, professional development, curricula, instructional materials, and course work to improve the teaching of mathematics and the sciences in grades K through 16.

Currently much of what we do, in terms of external support, in the Center is geared toward secondary and postsecondary education.

Workshops on the teaching of Geometry using technology.

AP Statistics and AP Calculus Workshops for Teacher Certification.

Texas Instruments Teachers Teaching Teachers with Technology summer workshops are available. Such workshops furnish teacher enhancement and calculators to participants.

Pre-service mathematics and science courses for elementary and secondary teachers which model effective inquiry based teaching methods to include the proper use of manipulatives, laboratories, technology and assessment are being taught.

Partners in the Project

- Anderson School District 3 & 5
- Clemson University
  - Department of Teacher Education(SOE)
  - Center for Excellence in Math and Science Education(COES)
  - Department of Mathematical Sciences
- USC-Upstate School of Education

Project Objectives

- Improving both content knowledge and pedagogical content knowledge of middle grades teachers of mathematics.
- Improving teacher content knowledge and pedagogical content knowledge should improve student achievement in mathematics.

Project Objectives

For FY 2009-2010, two graduate courses—a mathematics content class and a pedagogy class—are in the follow-up phase. These courses commenced with intensive two-week summer sessions in June and July of 2009.

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The pedagogy course is the first methods course offered through this grant, and is intended to improve participants' pedagogical content knowledge.

Upcoming courses

- Geometry for Middle Grades Teachers and Advanced Methods II for Middle Grades Teachers.
- The Geometry for Middle Grades Teachers course is intended to improve teacher content knowledge in geometry.
- Advanced Methods II is intended to increase pedagogical skill as well as pedagogical content knowledge - address strategies for implementing meaningful mathematical activities seamlessly within one's curriculum, with the intent of moving teachers beyond incorporating such activities as "add-ons" to their curriculum.

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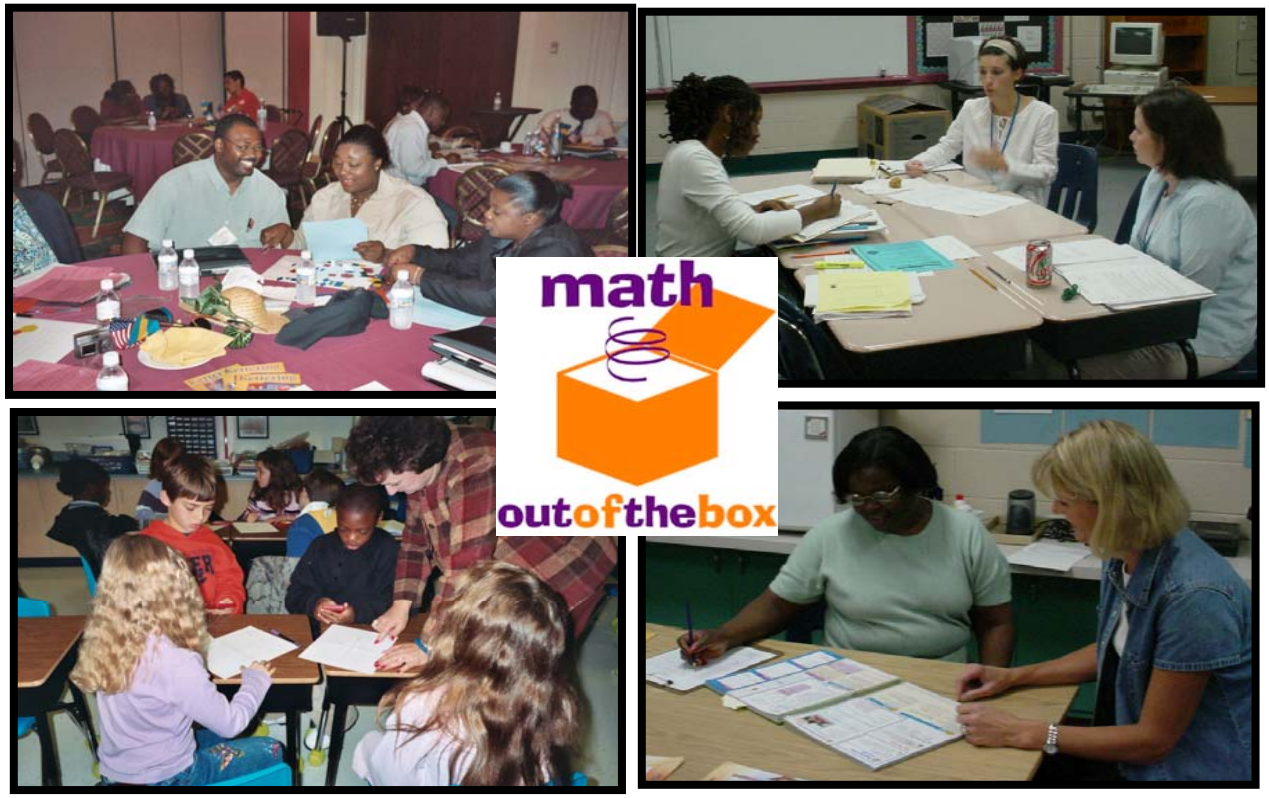
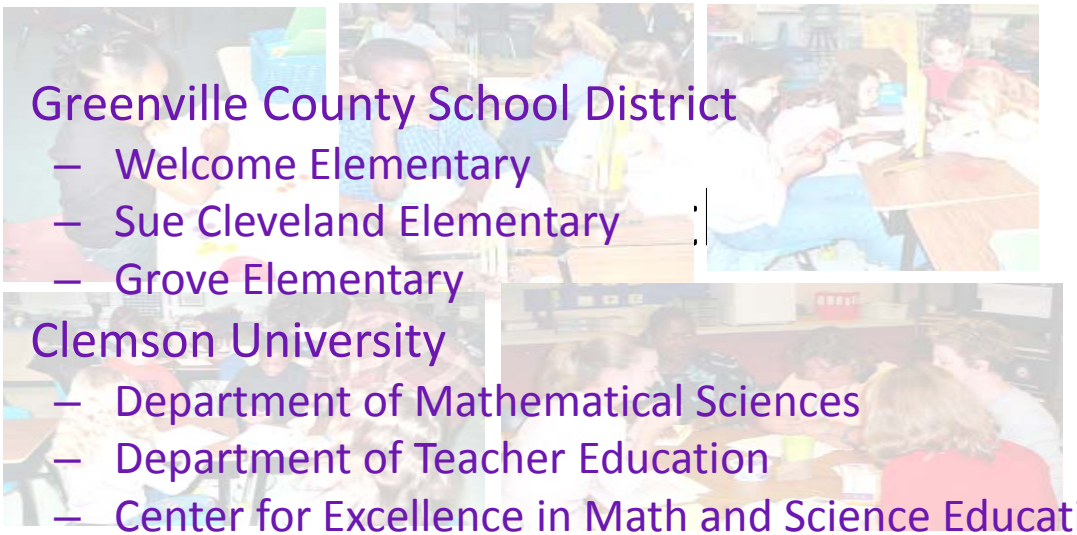
Professional Development through Curriculum Implementation



Building a Mathematical Learning Community



- Greenville County School District
  - Welcome Elementary
  - Sue Cleveland Elementary
  - Grove Elementary
- Clemson University
  - Department of Mathematical Sciences
  - Department of Teacher Education
  - Center for Excellence in Math and Science Education

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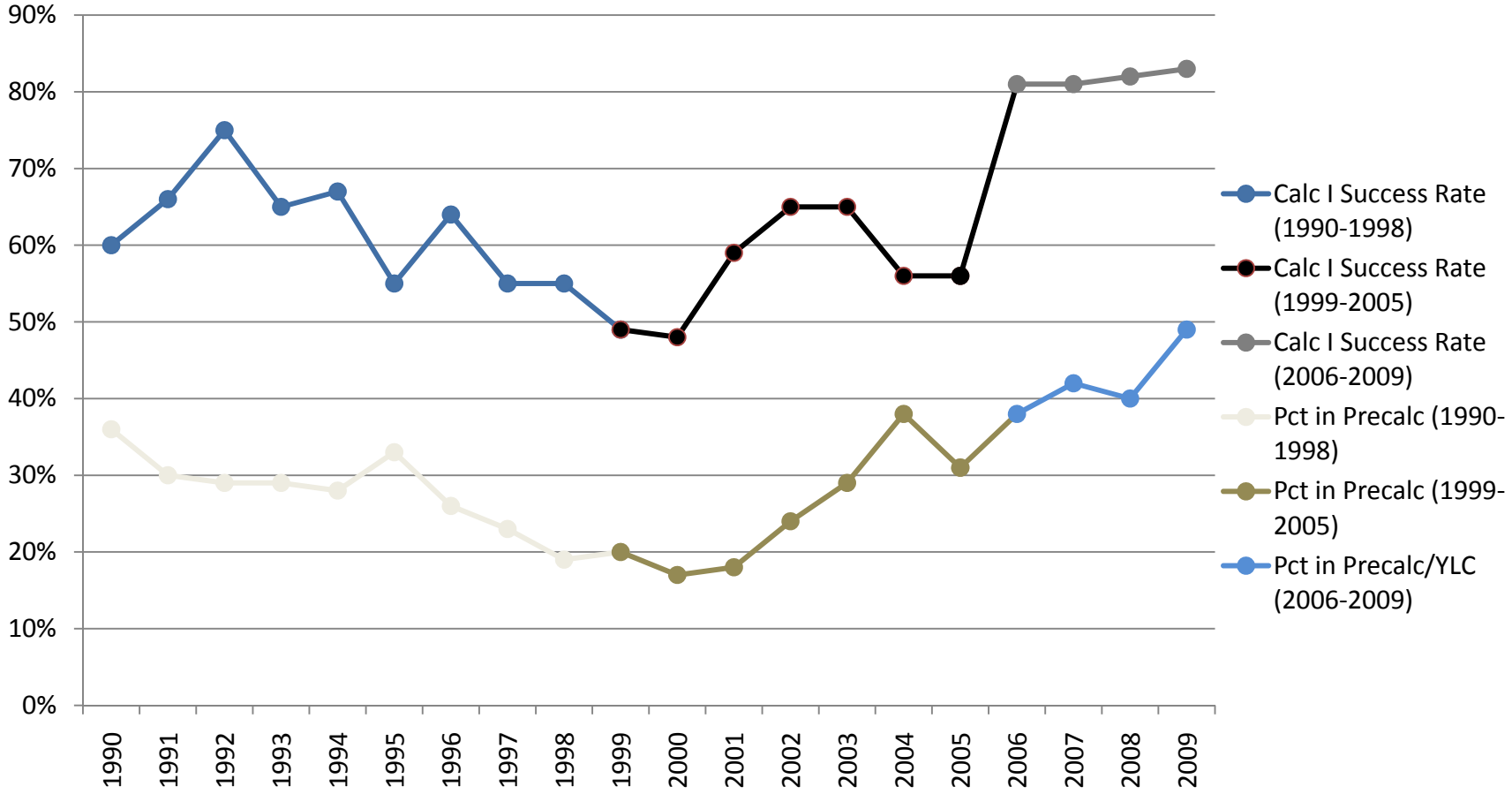
Current Issues

- Calculus and Transfer Students
- Annual Calculus Challenge
- Upstate of South Carolina Math Teachers' Circle

Calculus I Success Rates and % of Calculus I and Pre-calculus/Year-Long Calculus Students Who Are in Pre-calculus/Year-Long Calculus



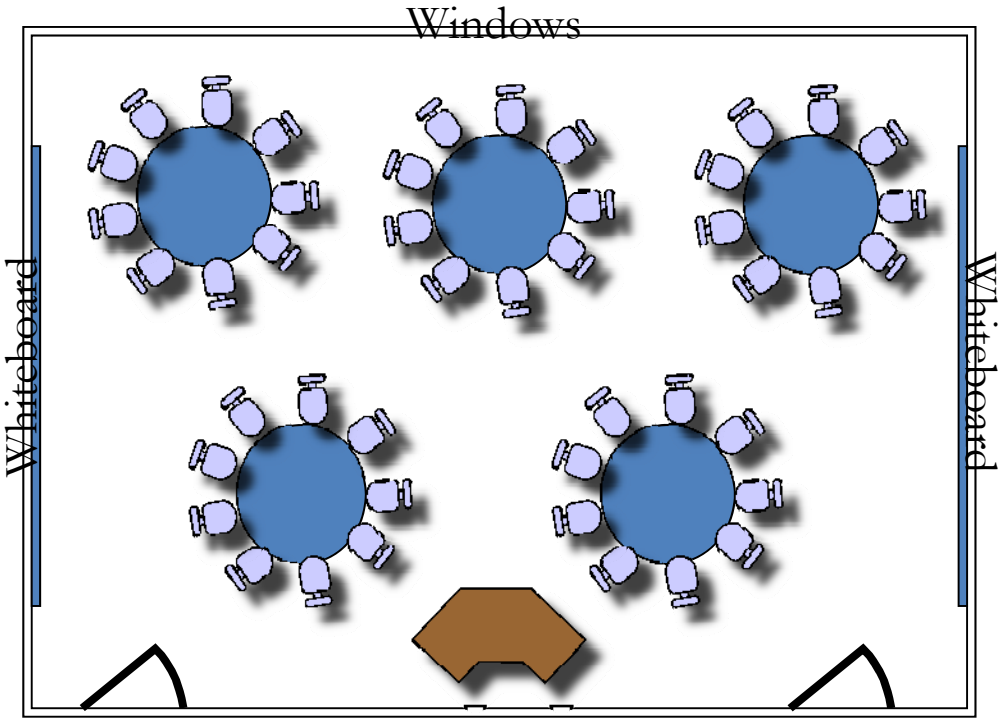
"SCALE-UP"

- **S**tudent-**C**entered **A**ctivities for **L**arge **E**nrollment **U**ndergraduate **P**rograms

- Originated at North Carolina State University in the Physics Education Research and Development Group.

- Originally designed for a class size of 72 students. Because of room size, the SCALE-UP version in Clemson's Math Sciences Department targets a class size of 45 students.

SCALE-UP Environment



- Each room contains five tables that seat nine students each
- Each table has wiring for internet and power.
- Professor lectures from a behind a table, with a “Sympodium,” and notes are projected onto two screens.

Current Center Activities at the Undergraduate level

- **S**TEM **T**alent **E**xpansion **P**rogram.
- Organic Pad: A Tablet PC Based Interactivity Tool for Organic Chemistry.
- NSF Calculus Strategies Assessment.