About the Project

❖*PRIME* =
Promoting Reflective Inquiry in Mathematics Education

❖A partnership of Rapid City (South Dakota) Area Schools, Black Hills State University, Technology and Innovation in Education, and Inverness Research Associates

❖Project began in Fall 2002; now in Year 8

Project Goals

❖Improve mathematics instruction, K-12

❖Reduce achievement gap between Native American and non-Native American students

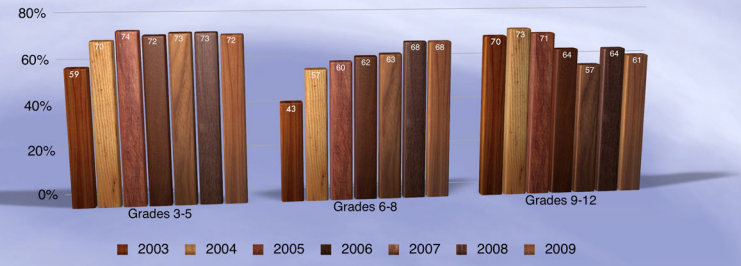
❖Improve pre-service preparation at BHSU

"...At Black Hills State University in Spearfish, South Dakota, Project PRIME, a partnership with the Rapid City Schools, uses school-based math coaches and graduate level courses for teachers to successfully boost math achievement among Native American students. I cite all these examples to point out that, with courage and commitment, our teacher preparation programs absolutely can provide dynamic and effective teacher preparation for the 21st century..."

Secretary Arne Duncan, in remarks made at Columbia University on October 22, 2009

Indicators of Success

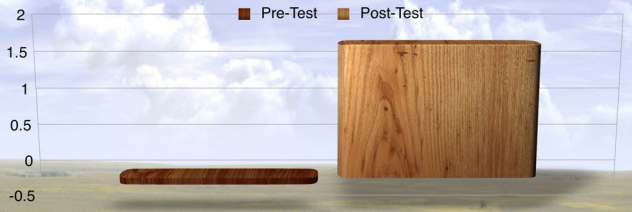
Rapid City Area Schools Dakota STEP - Mathematics



DSTEP Achievement Gap: White - Native American

RCAS Grades 3 - 8 Dakota Step Mathematics Test

Growth in Content & Pedagogical Content Knowledge



Challenges

Mathematics Teaching and Learning: Elementary Level

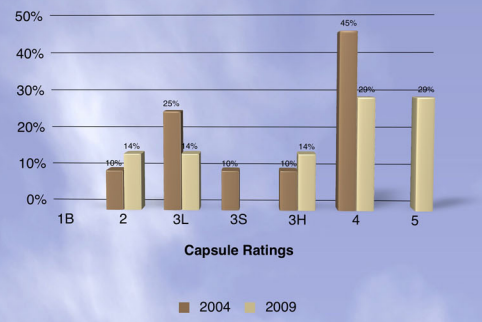
2004 Characteristics

- Range of instruction
- Mix and uneven use of instructional materials
- Range of school contexts and supports
- Less emphasis on student thinking and conceptual development
- Some engagement in meaningful work
- Some opportunity for students to clarify and articulate their mathematical thinking

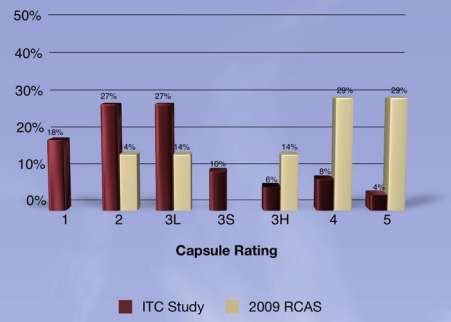
2009 Characteristics

- Consistent, effective, purposeful instruction
- Strong implementation of *Investigations*
- Students actively engaged in content and problem solving
- Students demonstrating conceptual understanding, number skill, fluency
- Sophisticated problem solvers

Mathematics Teaching and Learning:
Elementary Classroom Observation Ratings
Elementary Ratings Comparisons 2004 to 2009



Comparison Ratings:
RCAS Elementary Ratings Compared to Inside the Classroom Study, 2003 (National Sample)



Mathematics Teaching and Learning: Secondary Level

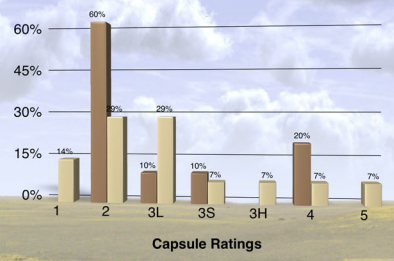
2004 Characteristics

- Range in lesson quality
- Some attempts at more student centered classrooms
- Mostly teacher-centered instruction and student worksheets as a central component of the lessons

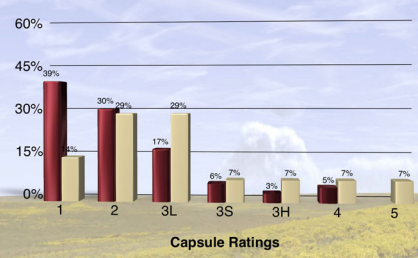
2009 Characteristics

- Range in lesson quality
- More instances of students working in groups and focus on student thinking
- Increased use of Standards-based instructional materials
- Sophisticated problem solvers

Mathematics Teaching and Learning:
Secondary Classroom Observation Ratings
Secondary Ratings Comparisons 2005 to 2009



Comparison Ratings:
RCAS Secondary Ratings Compared to Inside the Classroom Study



We'd like to learn. . .

1. How can we replicate our Elementary success in the Middle School and High School levels?

2. How can we impact the College of Education and the College of Arts & Sciences so that their mathematics teaching and learning reflect an inquiry approach?

Rapid City Area Schools

TIE Technology & Innovation in Education

Black Hills State University