The Partnership for Reform in Science and Mathematics

Partners

15 school systems: Atlanta, Bryan, Bulloch, Camden, Candler, Chatham, Clarke, Effingham, Evans, Glynn, Jackson, Oconee, Screven, Toombs, & Vidalia City • 7 IHEs: Armstrong Atlantic State University, College of Coastal Georgia, Georgia Perimeter College, Georgia Southern University, Georgia State University, Georgia Institute of Technology's Center for Education Integrating Science, Mathematics & Computing (CEISMC), and the University of Georgia • 2 state partners: University System of Georgia and the Georgia Department of Education

Definition of Student Success

SHORT TERM:

Teacher Behaviors Leading to Increased Student Learning

- Participation in PRISM sponsored professional learning – over 17,000 participants
- Increased use of inquiry and standards based teaching and learning by teachers who participated in PRISM learning communities - participants in PRISM Learning Communities reported higher use of inquiry based and standards based teaching and learning than those who did not
- Increased number of teacher leaders – 350 teachers were trained to serve as PRISM Lead Teachers and 25 were trained to be PRISM Teacher Leaders through the MSP Noyce Teacher Leader Program
- K- 5 Endorsements earned in mathematics – 1,158 Georgia K-5 teachers earned the math endorsement

LONG TERM:

Student Change

- Increased rigorous course taking - Georgia Performance Standards revised to include more rigor in science and mathematics for students in grades K-12, New Graduation Rule passed requiring one diploma and four years of mathematics and science for all.
- Student success on Georgia Assessments – Percent of students meeting or exceeding standards on the CRCT in science and mathematics for K-8 students increased, 13 of 15 PRISM districts improved their pass rate on the high school graduation test in mathematics (the two that did not improve still had above a 90% pass rate), and all 15 improved their pass rate in science.
- High school graduates ready to enter college: 100% of PRISM districts improved their graduation rate and PRISM institutions had a smaller percentage of students in learning support when compared to the University System (15.8% compared to 23.1%)
- Improved grades in intro college courses: The A,B, C rates improved for PRISM universities and colleges in Math Modeling, College Algebra, and Pre-Calculus

Research Design

PRISM is an extremely complex initiative with 10 strategies including regional and state strategies and policy and implementation strategies. Mixed-method research designs using quantitative and qualitative methods were used to conduct research for PRISM.

	Research Questions	Research Design	Instruments/data gathering procedures	Participants/Sample
Input	Who participated in the professional development? To what extent?	Document Analysis	Rosters of participants; Attendance rosters; Participant logs; Course rosters; course completion rates; IHE participants	All participating P-12 teachers in the four regions Participating college faculty
	What was the nature of the PD?	Document Analysis	PD/LC reading lists, agendas, etc.; Course syllabi; Participant logs.	All participating P-12 teachers in the four regions Participating college faculty
		Qualitative Methods	Interviews	Purposeful sample of teachers selected in each of the four regions. Sample balanced across grade level, subject (SM), school & student characteristics.
			Observation	Professional Develop Workshop delivers and participants.
Short term Outcomes	Did the participants acquire the intended knowledge and skills?	Pretest Posttest Design	Content Knowledge Instruments for P-5 math and science teachers; 6-8 math and science teachers; developed using publicly released TIMSS and NAEP items	All P-8 teachers participating in the endorsement courses Select professional development activities focusing on improved teacher content knowledge for P-8 teachers
		Quasi-Experimental Design Using Matched Control Group	*Inventory of Teaching and Learning (ITAL)*- Science and Mathematics.	All P-12 teachers in participating districts who teach mathematics and science to compare participants vs. non-participants IHE faculty who participate in the institute.
		Qualitative Methods	Interviews (See above)	(See above)
	Did the participants use the acquired knowledge and skills in the classroom?	Qualitative Methods	*Reformed Teaching Observation Protocol* (RTCP)	Random sample P-12 teachers and college faculty from each region. Sample to be balanced across grade level, subject (SM), school and student characteristics (Years 2-4 only)
		Quasi-Experimental	*ITAL* (see above)	(See above)
Long-term Outcomes	Did P-12 student achievement in SM improve?	Pretest Posttest Design using Cross-Sectional Data Quasi-experimental Design	Classroom, school and district level achievement tests (*Georgia CRCTs* in M grades 1-8; S in grades 3-8 and *Georgia High School Graduation* in SM)	Students of all P-12 teachers who participated in PD. Comparison group scores for demographically matched schools in non-participating regions of the state.
		Descriptive Methods	Student course taking, grades and pass rates in high school "challenging" SM courses	All students in state (state strategy to improve SM curriculum
	Did college student achievement in SM improve?	Pretest Posttest Design	Student grades and pass rates in core curriculum SM courses.	Students of all college faculty who participated in Institute & LC

Challenges

1. **Development of the Integrated Mathematics Curriculum** – the curriculum/standards development began immediately prior to the implementation of PRISM. At that time, IHE faculty were not as involved in the process. PRISM helped gather information to provide to the Department of Education (DOE), and the curriculum process was changed to ensure IHE was at the table every step of the way. PRISM also supported the development of additional resources for the implementation of the new curriculum.

2. **Requiring four years of science for graduation** – Georgia K-12 requirements included three years of science for graduation, PRISM staff sat on the DOE Graduation Task Force and initiated the inclusion of a fourth year of science.

3. **Changes in the curriculum meant changes in state-wide assessments** – comparing test scores from baseline year to the final year became difficult due to curriculum changes. PRISM had to create a new baseline using the first year of testing under the new curriculum.

Role of PRISM Partners

- **PRISM Leadership Team:** provide opportunity for partnership development and engagement
- **STEM Faculty:** provide professional learning for K-12 teachers, participate in professional learning communities, study their own teaching and learning, learn more about K-12 culture
- **K-12 districts:** support implementation of PRISM Strategies
- **K-12 teachers:** participate in PRISM Learning Communities, take PRISM supported professional learning courses, study the data to make informed decisions, learn more about IHE culture
- **Students:** understand the importance of taking rigorous science and mathematics courses