

Maine Physical Sciences Partnership

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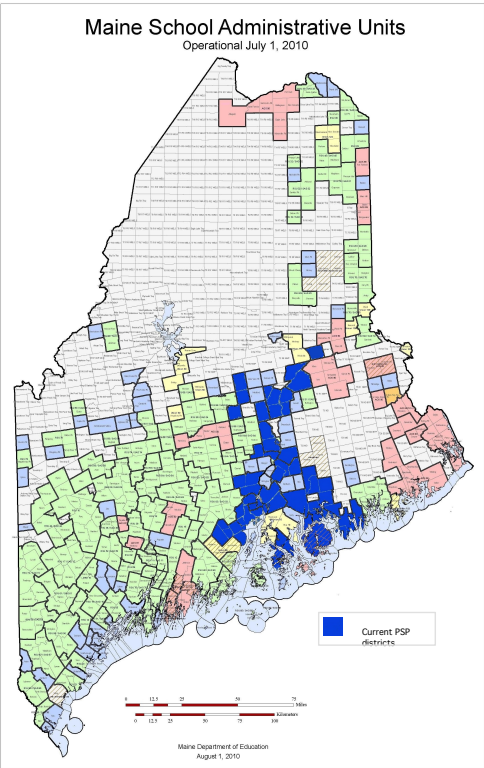
Defining Student Success

- Assumptions:** Student success arises from...
- Research-supported and validated teaching materials
 - Strong learning communities supporting professional advancement for teachers, teacher candidates, and faculty

Measures of success for our three defined populations of students

Student Population	Measures of Success
Grade 6-9 Students in participating middle and high schools	<ul style="list-style-type: none">• Maine Educational Assessment (MEA) and other learning assessments• Learning aspirations• Science courses taken
Teacher Candidates at the University of Maine (undergraduate and master's students)	<ul style="list-style-type: none">• Gains in content knowledge• Gains in pedagogical content knowledge (PCK)
Student Researchers at the University of Maine (master's and PhD students)	<ul style="list-style-type: none">• Publications• Degrees and theses• Research-supported materials

Project Overview: The Maine Physical Sciences Partnership is a collaboration between the University of Maine Center for Research in STEM Education (the RiSE Center) and 48 middle and high schools from the downeast, midcoast, and Penobscot River regions, along with the SERC Institute, the Institute for Broadening Participation, the Maine Department of Education, and the Maine Mathematics and Science Alliance.



Research Design

Consistent with our assumptions, research should address teachers' content knowledge and pedagogical content knowledge (PCK), the community support structures for teachers, and the use of materials in the classroom. Our research design will incorporate the following measures.

- Measure teacher content knowledge and pedagogical content knowledge (PCK), particularly knowledge of student ideas (KSI), using:
 - Assessments from the common curriculum
 - Classroom observations
 - Discussions during collaboratives
- Measure growth in professional community by:
 - Describing social networks among teachers, especially in online systems
 - Observing changes in participation at partnership collaboratives
- Measure impact of materials and professional development on student performance, using:
 - Assessments from the common curriculum
 - Maine Educational Assessment (MEA)
- Measure improvements in student aspirations, using:
 - Maine Educational Assessment (School level)
 - Enrollment in teacher preparation programs (University level)

Challenges

Challenges we've encountered so far:

- Partnership activities in a "flat community"
 - Research in a flat community (gathering data on certain participants without breaking the non-hierarchical tenets of the partnership)
 - Collaboration and evaluation – university organization of activities that affects teachers and schools
- Rural nature of the schools
 - Distance between partners
 - Communication between stakeholders
 - Many middle schools feeding into single high schools
- Format for curriculum development and professional development
- Short time frame
- Culture of local control

How we are addressing these challenges:

- Created a system for ongoing formative feedback
- Created an evaluation task force involving the teachers
- Developed regular collaborative meetings in three zones
- Built an online community
- Maintained focus on trust-building among partners

Partner Roles

Partner	Role
School level (teachers, curriculum coordinators, districts)	<ul style="list-style-type: none">• Curriculum design, implementation, and evaluation• Participation and feedback on professional development• Leadership and mentoring
University Level (Faculty, post-docs, staff)	<ul style="list-style-type: none">• Research• Curriculum design and evaluation• Professional development leadership
Schoodic Education and Research Center Institute (SERC)	<ul style="list-style-type: none">• Communication• Research
Maine Department of Education	<ul style="list-style-type: none">• Leadership training• Advocacy• Data access (MEA)
Institute for Broadening Participation (IBP)	<ul style="list-style-type: none">• Recruitment• Mentoring
Maine Mathematics and Science Alliance (MMSA)	<ul style="list-style-type: none">• Leadership training
PSP Advisory Board	<ul style="list-style-type: none">• Feedback• Advocacy
Inverness Research	<ul style="list-style-type: none">• External Evaluation