

RM-MSMSP Research Management Plan

Math and Science Standards	RM-MSMSP Goals	Research Question	Research Design	Outcome(s) Construct to be Measured	Instrumentation	Data Collection, Timing, & Personnel
Research Questions Associated with Teacher Change						
Professional development that fosters understanding of central mathematics and science content and practices	Enhanced teacher quality: Growth in learning math and science content	What is the effect on teachers' (1) content knowledge and (2) confidence in their content knowledge as a result of participating in the RM-MSMSP course sequence?	(1) One group time series design (2) Posttest only time series design	(1) Teacher content knowledge (2) Propositional knowledge sub-questions in RTOP and post course and post SFU surveys	(1) Teacher Content Inventory (TCI) (2) RTOP and surveys	(1) Use only content areas where existing TCI's whose psychometric properties have been established. Pretest, post-course posttest, and post SFU posttest. (2) Post course and during SFU
Classroom instruction and assessment that supports learning central mathematics and science content and practices.	Enhanced teacher quality: Growth in pedagogical content knowledge and skills	(1) How does teacher behavior change with varying intensities of RM-MSMSP professional development intervention (i.e. one course, multiple courses, one course plus SFU, multiple courses plus SFU)? (2) What is the effect on teachers' confidence in their pedagogical skills knowledge as a result of participating in the RM-MSMSP course sequence?	(1) Multi-group posttest only design – groups are participants who take only one course, who take one course plus an SFU, who take multiple courses without SFU, and multiple courses plus SFU (2) Posttest only time series design	(1) Lesson Design and Implementation Content: Propositional Pedagogic Knowledge Content: Procedural Pedagogic Knowledge Classroom Culture: Communicative Interactions Classroom Culture: Student/teacher Relationships (2) Teacher self-efficacy	(1) Reformed Teacher Observation Protocol (RTOP) (2) Teacher Self-Efficacy Inventory Year 1 Pre- Post-n=7 Yr 2 G1: Summer Academies only G1: SA and SFU one year G2 SA and SFU multiple years 20-30/group Follow-up for 2 yrs	(1) Observational measurement of teaching behavior after completion of each “benchmark” activity (i.e. course or SFU) – sorting into groups will be done post hoc based on teacher self-selection into courses and SFUs (2) Post course and during pre- post- SFU

Math and Science Standards	RM-MSMSP Goals	Research Question	Research Design	Outcome(s) Construct to be Measured	Instrumentation	Data Collection, Timing, & Personnel
		With what level of complexity (depth) do teachers trained in the full scope of RM-MSMSP professional development programs implement what they have learned in those programs?	One group time series design – interview measures at several intervals after receiving SFU	Depth of content of RM-MSMSP professional development	Interviews developed through the use of the Levels of Use interview protocol (LoU)	Year 2 End of First Quarter
		<p>(1) How does depth (level) of implementation of new knowledge and skills relate to demonstration of reformed teaching practice?</p> <p>(2) How does this relationship vary for participants who receive varying doses of new knowledge and skills (one course, multiple courses, SFUs)?</p>	<p>(1) Correlational</p> <p>(2) Correlational</p>		LoU and RTOP data collected from earlier research questions	<p>In the last year of the grant we look for “prototypes” – participants who completed the grant activity as it was intended – and do a final LoU and correlate the results with most recent RTOP results. Or maybe just the most recent LoU judgment</p> <p>Collect RTOP data immediately after summer academy, and collect second RTOP after a prescribed time after the SFU</p>

Math and Science Standards	RM-MSMSP Goals	Research Question	Research Design	Outcome(s) Construct to be Measured	Instrumentation	Data Collection, Timing, & Personnel
Research Questions Associated with Student Change						
The development of students' understanding of central mathematics and science content and practices	Access to challenging curriculum: growth in learning math and science	What is the effect on middle school students' math and science CSAP test results of their teachers' participation in the RM-MSMSP professional development programs?	Regression-discontinuity design; mixed quasi-experimental design (pretest-posttest alternative treatment design; HLM, other as appropriate	Achievement in mathematics and science	CSAP overall scaled scores in mathematics (aggregated to the teacher level); other localized measures, particularly in science	Bring all 7 district IT people in the same room at the same time and use Bush's Automated Exchange protocol to aggregated it Also building a plan to identify alternative achievement data in the districts (i.e. ITBS, Levels, MAPS) and what we need and how to get it
		Is participation in summer camp a predictor of student achievement?	Regression with independent variable grade point average or CSAP score in math/science	Challenging Courses Attitude Efficacy	End of camp survey Student Self-Efficacy Instrument Student Schedule Grades/CSAP	Assess students before and after camp Track through district records after camp
Research Questions Associated with Higher Education Instructional/Professional Practice Change						
Organizational capacity that is required to support the professional development and emerging instructional practices	Enhanced Teacher Pipeline: institutional change	How does being an instructor in the grant impact professional practice? How does their levels of concern vary over time?	Observational; case study	Changes in instructional/professional practice	Focus group, observation, and Interview data; RTOP; SoC	Interviews once a year; on line survey which includes SoC questions; RTOP once per year