Assessing the Impact of the MSPs: K–8 Science (AIM: K–8 Science)

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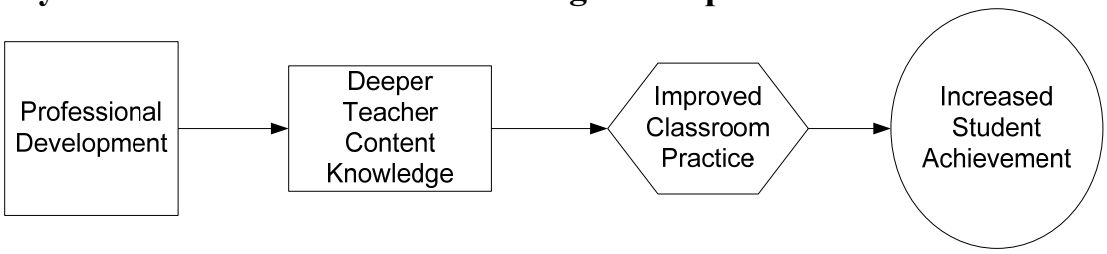
Overview

"Assessing the Impact of the MSPs: K–8 Science" is a three-year RETA led by Horizon Research, Inc. to study the impact of NSF's Math and Science Partnership (MSP) program on teacher content knowledge, classroom practice, and student achievement. AIM is developing content-specific instruments in six topics to use in a cross-site study. The study is examining the relationship between the nature of teachers' professional development experiences and both teacher and student outcomes across a number of MSP projects. The study is also documenting details on the professional development offered to teachers (i.e., the interventions), as well as measuring teacher content knowledge, teacher beliefs about teaching and learning, classroom practices, and student learning using common instruments across participating MSPs.

MSP Theory of Action and Instruments Being Developed



▪ PD-provider log ▪ PD observation protocol	▪ Teacher disciplinary content knowledge assessments	▪ Questionnaire scales ▪ Classroom observation protocol	▪ Student disciplinary content knowledge assessments

Primary Research Questions

1. What is the relative impact of different kinds of MSP professional development experiences on teacher disciplinary content knowledge?
2. What are the relationships among teacher disciplinary content knowledge, beliefs about teaching and learning, and classroom practices?
3. To what extent do teacher disciplinary content knowledge, teacher beliefs, and classroom practices impact student achievement? Do impacts vary for different sub-groups of students (e.g., race/ethnic groups)?

Content Areas Selected from the National Assessment of Educational Progress (NAEP) Framework

Physical Science
- Forces and Motion
- Forms of Energy
- Properties of and Changes in Matter

Life Science
- Populations and Ecosystems (i.e., Interdependence)
- Evolution and Diversity

Earth Science
- Climate and Weather

Timeline

Data collection will begin Summer 2010 in the areas of Forces and Motion and Populations and Ecosystems. Additional content areas will be added in Summer 2011.

Participation in the AIM Study

Opportunities are available for interested MSPs to participate in the AIM: K–8 Science study. There are two components of the study with expectations varying based on the component.

Component 1

The first component of the study examines the impact of the MSPs on teacher content knowledge and investigates the relative impacts of different professional development approaches.

Required:

- Complete daily PD-provider logs for relevant PD
- Provide teacher participation data
- Administer content assessment to teachers pre- and post-PD.
- Have PD observed

Optional:

- Administer content assessment to teachers after they teach the targeted topic

Component 2

The second component extends the work to explore the relationships among teacher content knowledge, classroom practices, and student achievement. The study is also examining which MSP approaches appear most promising for closing historic achievement gaps.

Required:

- Administer content assessment to teachers before they teach their unit on the targeted topic
- Administer student content assessment at the beginning and end of the unit on the targeted topic
- Administer teacher questionnaire

Benefits to Partner Projects

Additional Data for Project Studies:

- PD-provider log data
- PD observation data
- Teacher content assessment data
- Teacher beliefs and instructional practices questionnaire data
- Student assessment data

Additional Capacity:

- Observation training
- Item-writing training

Technical Assistance in the Design, Analysis, and Reporting of MSP Studies Related to Teacher Content Knowledge

Anticipated Challenges

- Developing content assessments that are broad enough to align to the differing needs of partner MSP projects but specific enough to be sensitive to instruction
- Developing valid and reliable self-report classroom practice instruments that measure student opportunity to learn
- Large-scale, multi-site data collection

Indicators of Success

- Creation of instruments with strong validity and reliability
- Data that further our understanding of the impacts of different approaches of PD on teachers, teaching, and student learning

Opportunities for Collaboration

- If your MSP is interested in participating in the AIM: K-8 Science study, please contact us.
- AIM is interested in learning about approaches other projects have taken to documenting the quality of professional development through methods other than observation.

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