Current Models for Evaluating Effectiveness of Teacher Professional Development

Recommendations to State Leaders from Leading Experts
Current Models for Evaluating Effectiveness of Teacher Professional Development

Recommendations to State Leaders from Leading Experts

Summary Report of a CCSSO Conference

Rolf K. Blank
Nina de las Alas

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Council of Chief State School Officers, Washington, DC. PI: Rolf K. Blank
rolfb@ccsso.org; 202 336-7044
Council of Chief State School Officers
The Council of Chief State School Officers (CCSSO) is a nonpartisan, nationwide, nonprofit organization of public officials who head departments of elementary and secondary education in the states, the District of Columbia, the Department of Defense Education Activity, and five U.S. extra-state jurisdictions. CCSSO provides leadership, advocacy, and technical assistance on major educational issues. The Council seeks member consensus on major educational issues and expresses their views to civic and professional organizations, federal agencies, Congress, and the public.

State Education Indicators
The Council is a strong advocate for improving the quality and comparability of assessments and data systems to produce accurate indicators of the progress of our elementary and secondary schools. The CCSSO education indicators project is providing leadership in developing a system of state-by-state indicators of the condition of K–12 education. Indicators activities include collecting and reporting statistical indicators by state, tracking state policy changes, assisting with accountability systems, and conducting analyses of trends in education.

CCSSO also works with states on studies and reports to analyze effects of state education policies and programs. This study is conducted under a grant to the Council of Chief State School Officers from National Science Foundation, Grant # REC 0438359. This CCSSO study is also possible because of the excellent cooperation and coordination by staff in each participating state department of education.

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Council of Chief State School Officers
Rick Melmer (South Dakota), President
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Council of Chief State School Officers
Attn: Publications
One Massachusetts Ave., NW, Suite 700
Washington, DC 20001
202-336-7016
Fax: 202-408-8072
www.ccsso.org

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Table of Contents

Rationale ........................................................................................................................................... 1

Presentations on Models .................................................................................................................. 1
Determining the Effectiveness of Professional Development: Substantive and Methodological
Findings and Challenges, with Implications for Evaluations
Laura Desimone ................................................................................................................................. 2

Using Experimental Designs to Evaluate the Impact of Professional Development
Michael Garet ........................................................................................................................................ 3

Improving State Management of Evaluations for Teacher Professional Development
Stephen Pruitt ........................................................................................................................................... 4

Models for Evaluating MSP Projects
Norman L. Webb .................................................................................................................................. 5

School-Based Learning and Development
Stephanie Hirsh and Joellen Killion ..................................................................................................... 6

Using the Surveys of Enacted Curriculum to Measure Changes in Teacher Practice and Content
Coverage
John Smithson ......................................................................................................................................... 7

Development and Use of Content-Specific Assessments of Teacher Knowledge
− or − How Do You Know If They’re Learning What You Want Them to Learn?
Sean Smith ............................................................................................................................................. 8

Using Longitudinal Data Systems for Evaluating School Improvement and Teacher Initiatives
Gary Cook ................................................................................................................................................. 9

Cross-State Analysis of Program Evaluation Findings
Rolf Blank and Nina de las Alas ........................................................................................................... 10

Breakout Discussion Questions .......................................................................................................... 11
Breakout Session I ............................................................................................................................... 11
Breakout Session II ............................................................................................................................. 11

Appendix - Participant List .................................................................................................................. 13
Rationale
In April 2008 CCSSO invited 10 leaders in the field of research and evaluation of teacher professional development to meet with state education program managers and evaluators to present and discuss models for evaluating effects of professional development. Recent developments with state data systems, use of experimental designs in education research, and use of surveys and assessments has provided the tools for improved methods of evaluating professional development. The two-day conference provided an opportunity for leaders from states to learn how they can apply the models in their state programs. CCSSO had three objectives for the conference:

- provide guidance for state leaders on recent research and evaluation models and how to use findings from research to develop quality, effective professional development programs for teachers
- identify sources of assistance to states for evaluation designs, data collection tools, and use of evaluations
- disseminate information and materials on recent products, materials, and reports useful to program managers and evaluators of professional development

States have responsibility for setting policies and making decisions on the kinds of professional development that will be supported and implemented under various funding sources. States also can take leadership in evaluating current professional development programs so that funds and program designs are based on evidence of what is working to improve teacher knowledge and skills and advance the quality of teaching in science and mathematics. CCSSO received a grant from the National Science Foundation to plan and conduct a meeting that would bring together research and evaluation experts and state leaders for professional development in mathematics and science education. The following summary of presentations and discussions from the April conference are intended to provide a wider audience with information about its recommendations and results. Please refer to the appendix for a list of participants. More information about the CCSSO work on improving evaluation of professional development and information about the April 2008 conference are available on the CCSSO website here.

Presentations on Models
Each of the sessions from the conference included a presentation by the invited expert, followed by a discussion with state leaders. Each session focused on a different approach to research and evaluation of teacher professional development.
Determining the Effectiveness of Professional Development: Substantive and Methodological Findings and Challenges, with Implications for Evaluations
Laura Desimone, University of Pennsylvania

What do we know about what works in professional development? And what does not? What makes professional development effective? How can we use that information to improve evaluation of professional development? These are the questions that Laura Desimone sought to answer with her presentation. First, based on her own research, including the National Study of the Eisenhower Teacher Professional Development program, and a review of findings from other recent research on effective professional development for teachers, Desimone listed the characteristics of high-quality professional development:

- offered for a longer duration and greater frequency
- involves teachers directly for more hours in active, engaged learning activities and environments
- focused on a particular content area, such as geometry or astrophysics, and allows teachers to gain knowledge on how to teach the content to their students
- coherent to teachers’ needs and circumstances
- involves teachers learning from their peers through collective participation

She also described how effective management and implementation of professional development programs and activities insure that high-quality professional development will work with sufficient supports in a sustained manner with the maximum of effect on teachers. Putting what research has defined as the characteristics of high-quality professional development together with research findings on effective education reform models, Desimone offered six suggestions for improving evaluations of professional development:

- Use inclusive definitions of professional development and measure the quality of teacher learning experiences.
- Design or participate in multi-method longitudinal and impact studies with mediating outcomes.
- Include a focus on subject-matter content.
- Use a conceptual framework.
- Account for state and district policy.
- Use self-report surveys that are focused on specific teacher behaviors, activities, and practices.

The full presentation is available at http://www.ccsso.org/content/pdfs/FindingsfromRecentResearch-Desimone.pdf
Using Experimental Designs to Evaluate the Impact of Professional Development

*Michael Garet, American Institutes for Research*

A research team composed of five partner organizations (American Institutes for Research, MDRC, REDA International, Inc., Sopris West, and Core) is currently conducting a five-year study that examines the impact of professional development on elementary schools and teachers. The use of an experimental design in this study was presented by Mike Garet, and he discussed with state participants when this kind of study is appropriate and important. The professional development initiative worked with school teams composed of second grade teachers, school reading specialists and special education teachers, and principal or vice principal. The design featured measurement of effects for two versions of professional development. The table below reveals the research design for the study.

<table>
<thead>
<tr>
<th></th>
<th>Treatment Group A</th>
<th>Treatment Group B</th>
<th>Control Group C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td>Institutes &amp; seminars only</td>
<td>Institutes &amp; seminars + coaching</td>
<td>“business as usual,” professional development provided by district</td>
</tr>
<tr>
<td><strong>Treatment assignment</strong></td>
<td>Randomly assigned schools to treatment conditions separately within each of the 6 participating districts</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong># of schools</strong></td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td><strong>Context</strong></td>
<td>Schools of districts using <em>Open Court</em> or Houghton Mifflin’s <em>Nation’s Choice</em> or <em>Legacy of Literacy</em>; excluded districts with substantial coaching programs, and excluded schools participating in Reading First</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>School characteristics</strong></td>
<td>Focused on high-poverty schools (&gt; 50% of students eligible for free lunch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unit of analysis</strong></td>
<td>School</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The research questions examine the difference among the three groups:

- What is the impact of institutes and seminars on teacher knowledge, classroom instruction, and student achievement? (compare Group A to Group C)
- What is the added value of coaching in improving teacher knowledge, classroom instruction, and student achievement? (compare Group B to Group A)
- What is the impact of the combination of institutes and seminars plus coaching? (compare Group B to Group C)
- Does the impact of professional development differ for teachers with lower or higher knowledge as measured at baseline?
- Do teacher knowledge and classroom instruction mediate the impact of professional development on student achievement?
Sharing lessons learned from the ongoing study, Dr. Garet offered the following suggestions to program evaluators:

- Increase the precision of the underlying theory of instruction and the specificity and intensity of the intervention, thus improving the alignment of measures and increasing the chance of getting large effect on proximal mediators.
- Conduct the study in contexts in which the curricular fit and support for the professional development are high, reducing mixed messages.
- Consider the effect size for teacher knowledge or practice needed to obtain the desired impact on achievement.
- Develop “packages” of related measures of teacher knowledge, instructional practice, and achievement.

More information about the study is available from the presentation http://www.ccsso.org/content/pdfs/UsingExperimentalDesigns_Garet.pdf

**Improving State Management of Evaluations for Teacher Professional Development**

*Stephen Pruitt, Georgia Department of Education*

As the director of academic standards at the Georgia Department of Education, Stephen Pruitt was directly responsible for providing the means for the state to meet its [15-point mission](http://www.ccsso.org/content/pdfs/ImprovingStateMngmtofEvals_Pruitt.pdf): to “lead the nation in improving student achievement by functioning as a service-oriented and policy-driven agency that meets the needs of all local school systems as they go about the business of preparing all students for a college or career….,” His presentation zeroed in on Goal 8: “significantly improve math and science achievement of middle and high school students.” Using three levers at his disposal—Math Science Partnership grants, Science Mentor programs, and [School Keys: Unlocking Excellence through the Georgia School Standards](http://www.ccsso.org/content/pdfs/UsingExperimentalDesigns_Garet.pdf)—Mr. Pruitt demonstrated how he was able to standardize the requests for professional development funding support and set implementation and evaluation requirements and procedures. As an example he pointed out the use of a [standard Math and Science Partnership (MSP) project observation report](http://www.ccsso.org/content/pdfs/ImprovingStateMngmtofEvals_Pruitt.pdf) for site visits and a [partnership rubric](http://www.ccsso.org/content/pdfs/ImprovingStateMngmtofEvals_Pruitt.pdf) for ensuring that the partnership remains viable and on-track toward its mission.

The School Keys are the foundation for Georgia’s comprehensive, data-driven system of school improvement and support. Correlated to several well-known and respected research frameworks, the School Keys describe what Georgia school staffs need to know, understand, and be able to do, in the same manner that the Georgia Performance Standards describe what Georgia’s students need to know, understand, and be able to do. In particular, the School Keys provide standards for professional learning.

For more information on the Georgia model, see the full presentation [http://www.ccsso.org/content/pdfs/ImprovingStateMngmtofEvals_Pruitt.pdf](http://www.ccsso.org/content/pdfs/ImprovingStateMngmtofEvals_Pruitt.pdf)
Models for Evaluating MSP Projects

Norman L. Webb, University of Wisconsin-Madison

Using the life-cycle stages of a program (planning, implementation, impact), Norman Webb raised the corresponding evaluation design considerations. For example, at the planning stage of a program, one should consider overall the compatibility between the program design and evaluation design. Specifically in the selection of teachers and schools (all, volunteers, purposeful) to receive the program, one should consider how that would match with evaluation designs that are experimental or quasi-experimental—considered the “gold” and “silver” standards of research design. At the implementation stage, Dr. Webb points to Thomas Guskey’s five critical levels of evaluating professional development and his recommendations for the kinds of measures for each level that record linkages between the professional development and intermediate and ultimate outcomes:

1. participants’ reactions
2. participants’ learning
3. organization support for change
4. participants’ use of new knowledge and skills
5. student learning outcomes

Dr. Webb offered several issues to consider when evaluating the design and evaluation of professional development, including

- time frame
- proof-of-concept studies
- breadth vs. depth
- formative studies
- aligned measurement instruments
- living with imperfection
- analytic horizon mismatch with funding

More of Dr. Webb’s presentation is available at http://www.ccsso.org/content/pdfs/AnalyzingStateAchievementData_Webb.pdf
School-Based Learning and Development  
*Stephanie Hirsh and Joellen Killion, National Staff Development Council*

The National Staff Development Council has established five characteristics of effective professional learning in the Standards for Staff Development produced by this large professional organization:

- **Results-driven**: Clear expectations for what students are expected to know and do, for what educators must know and be able to do to ensure student success, and for what professional development must offer to enable educators to develop the knowledge and skills to develop drive students to achieve.
- **Standards-based**: NSDC standards address the content and pedagogical knowledge and skills educators must learn, but also speak to the process that supports adult learning and the context in which educators learn.
- **Content-rich**: Professional development is grounded in content-specific pedagogy.
- **School-centered**: Learning is taking place within the school through professional learning communities.
- **Job embedded**: Professional learning activities are ingrained into the day-to-day lives of teachers.

More information about NSDC’s standards is available at [http://www.nsdc.org/standards/index.cfm](http://www.nsdc.org/standards/index.cfm)

Ms. Hirsh and Ms. Killion recommended that evaluation of staff development use multiple sources of information to guide improvement and demonstrate its impact. Among the dependent variables evaluators might consider are teacher knowledge, skill, disposition, and instructional practice/behavior, as well as student learning in the form of knowledge, skill, disposition, and behavior. They noted that the greatest challenge is unlocking the respective black boxes of teacher and student interpretation and utilization of available understandings and skills.

To view their presentation, go to [http://www.ccsso.org/content/pdfs/School-basedLearningandDev_NSDC.pdf](http://www.ccsso.org/content/pdfs/School-basedLearningandDev_NSDC.pdf)
The Surveys of Enacted Curriculum (SEC) collects data on instructional content, instructional activities, teacher professional development, and teacher characteristics, opinions, and beliefs from teachers in K-12 mathematics, science, English language arts & reading, and social studies. Data generated from the SEC allow for teacher reflection on his/her own practices, establishes a platform for teacher collaboration and planning, and provides comparable data on classroom instruction in relation to state standards. The curriculum data can be combined with other data sources, such as student achievement, to provide a rich resource for research and evaluation with professional development initiatives.

One example was presented showing the use of data from the online SEC system to examine changes in teacher instruction and their relationship to the quality of professional development. Teachers in the treatment group who were participating in the Missouri PRISM (MSP project) were compared to non-MSP teachers in the same districts.

The teacher groups were compared over time using the following key measures:

- number of hours of participation in formal coursework and institutes
- indicators of quality professional development (e.g., active engagement in professional development, content-focused material, collective participation)
- instructional practice (e.g., use of educational technology, students analyze information, synthesize/integrate information)

To access John Smithson’s presentation, go to http://www.ccsso.org/content/pdfs/UsingSECtoMeasureTeacherPractice_Smithson.pdf. For more information about the Surveys of Enacted Curriculum, go to http://www.secsurvey.org
Sean Smith directly addressed the question of how researchers and educators can determine the program impact on teacher content knowledge. Often, evaluators are challenged with how to assess teacher learning because of (1) the lack of well-established instruments to measure teacher content knowledge, (2) a professional culture that is adverse to measuring teacher knowledge, and (3) a lack of agreement in the education community on what “it” is —what teacher phenomenon they are attempting to capture. Dr. Smith outlined six domains of teacher knowledge, including

- disciplinary content knowledge
- representing ideas
- student thinking about the content
- strategies to diagnose the thinking of a particular group of students
- sequencing ideas for students
- content-specific strategies that move students’ thinking forward

Smith highlighted a number of assessments on teacher knowledge in math and science, including Learning Mathematics for Teaching (LMT), Diagnostic Teacher Assessments in Mathematics and Science (DTAMS), Knowledge of Algebra for Teaching (KAT), and Misconception Oriented Standards-based Assessment Resource for Teachers (MOSART). During the question-answer session, conference participants who had used or reviewed teacher assessments discussed appropriate use of the assessments and their limitations, and a need was identified for improved assessments for high school teachers.

Dr. Smith’s complete presentation is available at [http://www.ccsso.org/content/pdfs/DevandUseofTeacherAssessments_Smith.pdf](http://www.ccsso.org/content/pdfs/DevandUseofTeacherAssessments_Smith.pdf). CCSSO has profiled a number of tools and instruments for evaluation, including assessments of teacher knowledge, which are available [here](http://www.ccsso.org/content/pdfs/DevandUseofTeacherAssessments_Smith.pdf) on the CCSSO project’s website under “Evaluation Tools for Professional Development.”
Using Longitudinal Data Systems for Evaluating School Improvement and Teacher Initiatives  
Gary Cook, Wisconsin Center for Education Research

Gary Cook provided an overview of longitudinal data systems, explaining what they are, what kinds of data and data systems are necessary to have longitudinal data, and examples of their use in research or program evaluation. Key to making any links between teacher initiative and student outcomes is a data system that matches data using unique student identifiers with unique teacher identifiers, as specified by the Data Quality Campaign, http://www.dataqualitycampaign.org/.

Dr. Cook then cited three studies as illustrative of the promises and challenges in using longitudinal data.

One study design had attempted to compare effects of traditional and nontraditional teacher preparation programs on student achievement, but the researchers were challenged by the lack of essential data elements to characterize the teacher programs. Therefore, they could not answer the research question, “Are gains in student reading/math scores related to differences in how teachers are prepared for teaching?”

In another study, the researchers were investigating the nature of ELL students’ growth in English as measured by state ELP assessments. They were able to conduct the analyses, but there were gaps in the information available (e.g., state data sets had no identifiers for poverty at the student level). Several key ideas in preparation and planning were discussed. Although longitudinal data analyses are very powerful, they require thoughtful planning of questions, measures, data preparation, and management. Longitudinal data studies generally require partnering with those with expertise and access to the systems, but the returns on the investment can be worthwhile in that more specific questions can be addressed and more nuanced analyses are possible.

See more of Gary Cook’s presentation at http://www.cesso.org/content/pdfs/UsingLDSforSIEval_Cook.pdf
Cross-State Analysis of Program Evaluation Findings
Rolf Blank and Nina de las Alas, CCSSO

Rolf Blank and Nina de las Alas presented the latest findings from a two-year study that reviewed and analyzed results from evaluations of 25 teacher professional development initiatives in 14 states. The study was conducted in two phases, to answer the following questions:

- **Phase I**: How can quality of professional development be compared across programs and states? What is the extent of variation in quality found in a voluntary sample of programs highly rated within their states?
- **Phase II**: What are the evaluation designs and tools being used across programs and states? What are the effects that are reported from professional development as measured by teacher knowledge gains, change in instructional practices, or improvements in student achievement?

A detailed account of the study’s methodology for analysis of quality of programs is available in the 2007 report. Of particular note are the Program Review Rubric and its corresponding guide that reviewers used to analyze the documents. Findings from the second phase of the study showed that about one-third of program evaluations reported measurable effects of teacher professional development, and seven reports documented measurable results on student outcomes.

A paper summarizing study findings and recommendations for state leaders is available at [http://www.ccsso.org/content/pdfs/cross-state_study_rpt_final.pdf](http://www.ccsso.org/content/pdfs/cross-state_study_rpt_final.pdf).
**Breakout Discussion Questions**

**Breakout Session I**

The Tuesday afternoon breakout session focused on how states could apply experimental research designs to evaluate professional development impact. Specifically, states gathered around tables to reflect and share in response to the following questions:

- What kinds of evaluation models are used in your state to measure the outcomes of PD?
- How do the evaluations in your state compare to the experimental design described in Dr. Garet’s presentation?
- How do evaluations of PD in your state measure teacher practice?
- How do evaluation of PD in your state measure student achievement?
- Do you have plans to change the expectation for evaluation of PD in your state?
- What challenges and issues must be faced for your state to improve the evaluation of PD?

Through these questions, participants discussed the current and past professional development evaluation models in their states or projects. For the most part, states had some promising evaluations, with a few that have attempted or are attempting to gauge impact of professional development on student outcomes. However, the school-based experimental design presented by Dr. Garet is still a model that states and districts hope to aspire to, given the limited resources states have, the challenges of recruiting whole schools to a study, and the data requirements that must be met in order to make any linkages to professional development possible.

**Breakout Session II**

The Wednesday morning breakout session took the workshop’s presentations as a whole and raised the following items for consideration:

- what was the most useful information gleaned from the workshop
- comparisons of past and current evaluations of professional development conducted in states against the evaluations presented at the workshop
- rating data collection systems (with individual student- and teacher-level data) in the states
- areas that CCSSO can follow up and assist states in applying effective models for evaluation of professional development

Generally, participants found all the information provided at the workshop to be very useful, given that states continue to struggle with having high-quality professional development programs available to teachers statewide and with having strong evaluations designs that would produce measurable outcomes on teachers and students. States look to the gold standard of experimental designs as the goal for evaluations. Among the challenges that states face is having data collection systems that could support experimental and quasi-experimental evaluation designs. Participants look to CCSSO to
• continue to champion better reporting practices
• assist in garnering resources for improved data collection systems that support better evaluations and for better tools to measure teacher and student changes
• raise awareness of better practices and policies that support high-quality professional development and their evaluations

Details about the breakout sessions are available at
http://www.cesso.org/content/pdfs/DiscussionQuestions0408.pdf
Appendix - Participant List

ARKANSAS
University of Arkansas
Calli Johnson
Research Associate
346 North West Ave.
Fayetteville, AR 72701
479-575-5593 phone
479-575-5185 fax
cajohns@uark.edu email

University of Arkansas
Charles Stegman
Professor
346 North West Ave.
Fayetteville, AR 72701
479-575-5593 phone
479-575-5185 fax
cstegman@uark.edu email

COLORADO
RMC Research Corporation
John Sutton
Senior Research Associate
1512 Larimer St.
Denver, CO 80202
800-922-3636 phone
303-825-1626 fax
sutton@rmcdenver.com email

ARIZONA
Arizona Dept. of Education
Mary Knuck
Deputy Associate Superintendent
1535 W. Jefferson St.
Phoenix, AZ 85007
602-364-2353 phone
602-364-0902 fax
Mary.Knuck@azed.gov email

CONNECTICUT
Connecticut State Dept. of Education
Elizabeth Buttner
MSP State Coordinator-Science
Bureau of Curriculum & Instruction
Hartford, CT 06145
860-713-6849 phone
860-713-7018 fax
elizabeth.buttner@ct.gov email

CALIFORNIA
California Dept. of Education
James Greco
Administrator, Math & Science Leadership
Sacramento, CA 95814
916-323-6189 phone
916-323-2833 fax
jgreco@cde.ca.gov email

FLORIDA
University of Southern Florida
Gladis Kersaint
Associate Professor, Mathematics Education
4202 E. Fowler Ave, EDU162
Tampa, Fl, FL 33620
813-974-1644 phone
813-974-3383 fax
kersaint@coedu.usf.edu email

ILLINOIS
Center for Science and Mathematics Education
Rachel Shefner
Associate Director
Loyola University Chicago
Chicago, IL 60626
773-508-8335 phone
773-508-3506 fax
rshefne@luc.edu email
Illinois State Board of Education
Gwen Pollock
Principal Education Consultant
100 North First
Springfield, IL 62777
217-557-7323 phone
217-782-7937 fax
gpollock@isbe.net email

KENTUCKY
Kentucky Dept. of Education
Karen Kidwell
Science Consultant
500 Mero Street
Frankfort, KY 40601
502-564-2106 phone
502-564-9848 fax
karen.kidwell@education.ky.gov email

Kentucky Science and Technology Corporation
Stephen Henderson
Vice President for Education Programs
PNC Bank Plaza
Lexington, KY 20507
859-255-3511 phone
859-259-0986 fax
shenderson@kstc.com email

LOUISIANA
Louisiana Dept. of Education
Jean May-Brett
MSP Program Coordinator
1201 N. Third Street
Baton Rouge, LA 70802
225-342-8993 phone
225-342-9891 fax
jean.may-brett@la.gov email

MARYLAND
Maryland State Dept. of Education
Nancy Carey
Coordinator of Professional Development
200 West Baltimore Street
Baltimore, MD 21201
410-767-0441 phone
410-333-2369 fax
ncarey@msde.state.md.us email

NEVADA
University of Nevada
Jacque Ewing-Taylor
Project Director, STEM Education
Mail Stop 432
Reno, NV 89557
775-784-7784 phone
775-327-2016 fax
jacque@unr.edu email

NEW MEXICO
New Mexico Public Education Department
Pascal Buser
Research Analyst
300 Don Gaspar
Santa Fe, NM 87501
505-400-3416 phone
505-827-1784 fax
pascal@unm.edu email

NEW YORK
New York State Education Department
Connie Centrello
Associate
89 Washington Avenue, Rm. 320 EB
Albany, NY 12234
518-474-5922 phone
518-473-4884 fax
ccentrel@mail.nysed.gov email
NORTH CAROLINA
Compass Consulting Group
Anne D'Agostino
Evaluator
5726 Fayetteville Road
Durham, NC 27713
919-544-9004 phone
919-321-6997 fax
anne-d@mindspring.com email

North Carolina State University
Bernice Campbell
Coordinator
1890 Main Campus Drive
Raleigh, NC 27606
919-513-8541 phone
919-851-7512 fax
bernice_campbell@ncsu.edu email

NORTH DAKOTA
North Dakota Dept. of Public Instruction
Linda Paluck
Program Director - School Approval & Accreditation
600 E. Boulevard Ave., Dept 201
Bismarck, ND 58505-0440
701-328-2488 phone
701-328-4770 fax
lpaluck@nd.gov email

Roughrider Education Services Program
Lois Myran
Executive Director
444 4th St. West
Dickinson, ND 58601
701-456-0002 phone
701-456-0035 fax
lois.myran@sendit.nodak.edu email

OREGON
Northwest Regional Educational Laboratory
Edith Gummer
Director
101 SW Main Ste 500
Portland, OR 97204-3297
503-275-9168 phone
503-275-0445 fax
gummere@nwrel.org email

Public Works Inc.
Mikala Rahn
President
90 N. Daisy Ave.
Pasadena, CA 91107
626-564-9890 phone
626-564-0657 fax
mikala@publicworksinc.org email

RHODE ISLAND
The Education Alliance at Brown University
Elise Arruda
Research and Evaluation Specialist
222 Richmond St
Providence, RI 02903
800-521-9520 phone
401-421-7650 fax
elise_arruda@brown.edu email

Rhode Island Dept. of Education
Judith Keeley
Education Specialist, Mathematics
8 Indigo Farm Road
Harrisville, RI 02830
401-222-8452 phone
401-222-6033 fax
Judith.Keeley@ride.ri.gov email

Rhode Island Dept. of Education
Diane Schaefer
Director, Office of Instruction
255 Westminster Street
Providence, RI 2903
401-222-8436 phone
401-222-6033 fax
diane.schaefer@ride.ri.gov email