


Advanced Search

MSPnet Hub

Welcome, the Hub connects all projects

The Math and Science Partnership Network

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Improving Teacher Content Knowledge



MSPnet is an electronic learning community for the Math and Science Partnership Program. With the MSP program, the National Science Foundation implemented an important facet of the President's No Child Left Behind (NCLB) vision for K-12 education. A major research and development effort, the MSP program responds to concern over the performance of the nation's children in mathematics and science. Institutions of higher education partner with K-12 districts and others to effect deep, lasting improvement in K-12 mathematics and science education.

LOG IN

 Email
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ABOUT MSPnet

MSPnet is created and facilitated by the Center for School Reform at TERC. This site is supported by the National Science Foundation. Opinions expressed on this site


NEW MSP PAPER

MSP of Greater Philadelphia: A Longitudinal Analysis of Institution of Higher Education Faculty Engagement in a Math and Science Partnership Project,
N. Rui, J. Feldman, Annual Meeting of American Educational Research Association, May 3, 2010.

MSPnet LIBRARY

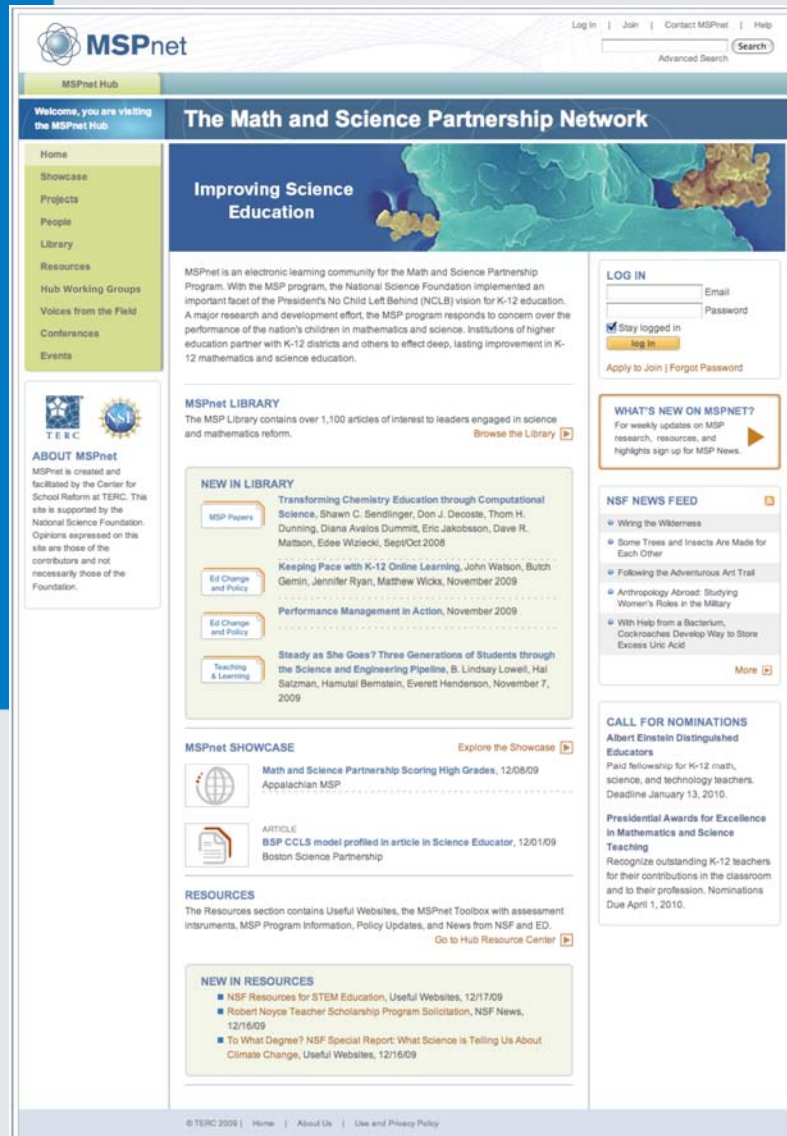
The MSP Library contains over 1,100 articles of interest to leaders engaged in science and

WHAT'S NEW ON MSPNET?

For weekly updates on MSP research, resources, and highlights sign up for MSP News. 

ANNOUNCEMENTS

NEW! MSP Program Solicitation
Full Request Guidelines



The screenshot shows the MSPnet.org website. At the top, there is a navigation bar with links for 'Log In', 'Join', 'Contact MSPnet', and 'Help'. Below this is a search bar. The main header reads 'The Math and Science Partnership Network' and 'Improving Science Education'. A sidebar on the left contains a menu with items like 'Home', 'Showcase', 'Projects', 'People', 'Library', 'Resources', 'Hub Working Groups', 'Voices from the Field', 'Conferences', and 'Events'. The main content area features a 'NEW IN LIBRARY' section with several article listings, an 'MSPnet SHOWCASE' section, and a 'RESOURCES' section. There are also sections for 'LOG IN', 'WHAT'S NEW ON MSPNET?', and 'NSF NEWS FEED'.

MSPnet.org

- Professional learning community serving NSF's Math and Science Partnership Program (MSP)
- Over 2,500 Registered Guests
- Over 5,500 MSP Project Members
- Collection of STEM Resources carefully gathered and catalogued since 2004.
- Valuable resources for professional developers → available without log-in

MSPnet Library

Over 1,100 freely available papers and articles related to STEM education. Search areas of interest, find articles by leaders in the field, and discover findings from MSP project work.

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Library

The library contains over 1100 articles of interest to leaders engaged in K-12 science and mathematics education reform. Browse the library by the themes listed below or locate an article by standard search.

MSP Papers (244 items) ▶

These papers are authored by or about MSP projects

[MSP Papers](#)

MSP Key Features (411 items) ▶

Keywords within this theme:

Partnership-Driven | Teacher Quality, Quantity and Diversity | Challenging Courses and Curricula | Evidence-Based Design and Outcomes | Institutional Change and Sustainability

Ed Change & Policy (918 items) ▶

Keywords within this theme:

Systemic Change | Mathematics | Science | Technology | Equity | International/TIMSS | Standards | Evaluation | School Culture | Public Engagement

Teaching and Learning (577 items) ▶

Keywords within this theme:

Science | Mathematics | Student Support | Technology | Pedagogy | Assessment

Prof. Dev. (418 items) ▶


Keywords within this theme:

Promoting Change | Leadership | Content Knowledge | Careers | Pre-service | Curriculum | Teacher PD | Administrator PD

Higher Ed (184 items) ▶

Keywords within this theme:

Policy | STEM Teaching & Learning | Preservice Teacher Ed



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FEATURED ARTICLE

Professional Development

The Mathematics and Science Teacher Shortage: Fact and Myth ▶

*Contemporary educational thought holds that one of the pivotal causes



OPTIONS

Post a New Article ▶

Search in Library ▶

NEW IN LIBRARY

The Mathematics and Science Teacher Shortage: Fact and Myth

By Richard Ingersoll, David Perda, CPRE Research Report.

Teachers' Use of Educational Technology in U.S. Public Schools: 2009

By Lucinda Gray, Nina Thomas, Laurie Lewis, National Center for Education Statistics.

Learning Progressions in Science: An Evidence-based Approach to Reform

By Tom Corcoran, Frederic Mosher, Aaron Rogat, CPRE Research Report.

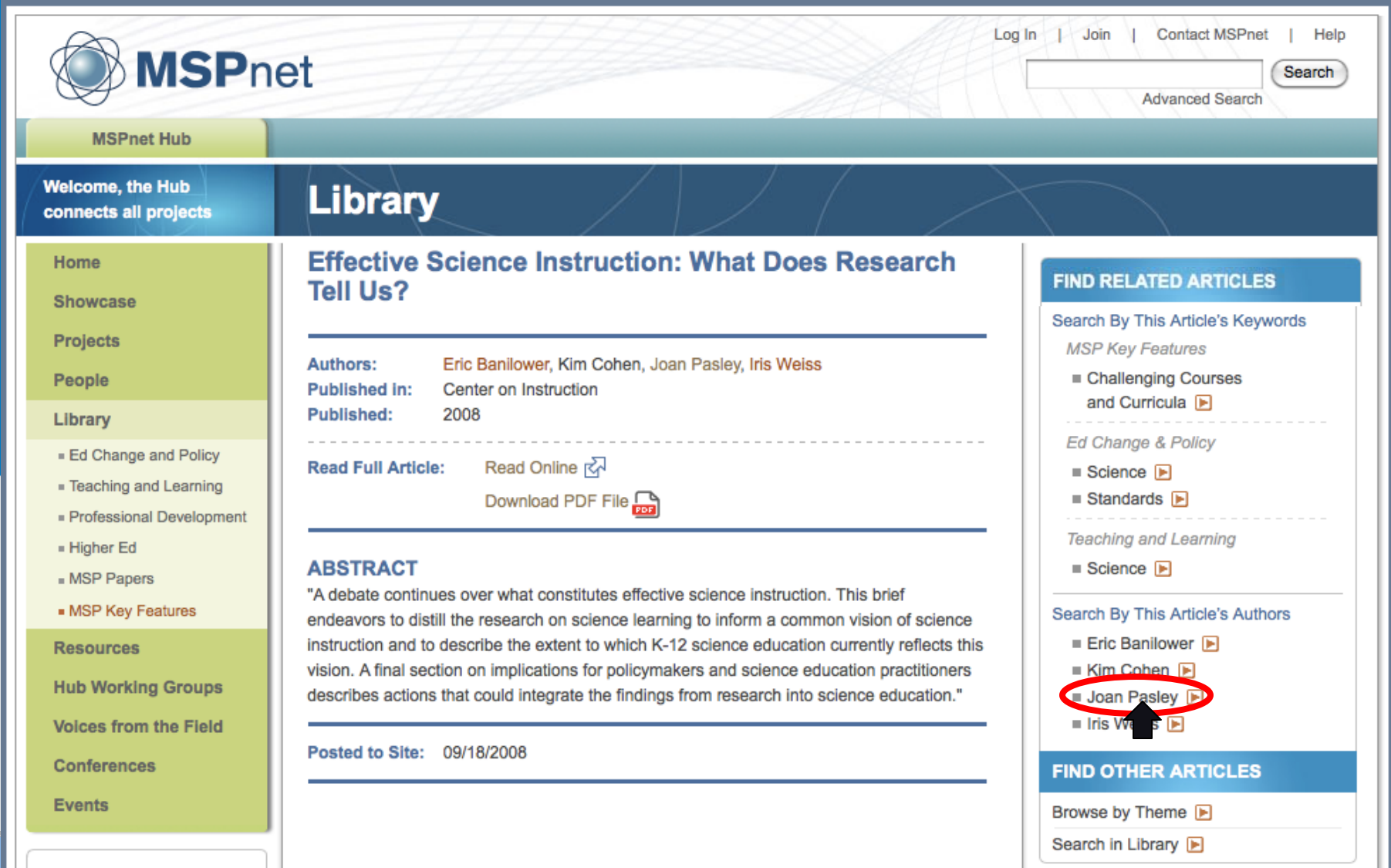
Understanding NSF Grantees' Engagement

By Deborah Pomeroy, Ning Rui, AERA.

Synergistic Interactions of K-16 Partnership Work, Research, and Teaching

...

MSPnet Library: Many ways to find articles of interest



The screenshot shows the MSPnet Library website interface. At the top, there is a navigation bar with the MSPnet logo, a search bar, and links for Log In, Join, Contact MSPnet, and Help. Below the navigation bar is a header section with 'MSPnet Hub' and 'Welcome, the Hub connects all projects'. The main content area is divided into a left sidebar, a central article, and a right sidebar.



MSPnet Hub

Welcome, the Hub connects all projects

Library

Effective Science Instruction: What Does Research Tell Us?

Authors: Eric Banilower, Kim Cohen, Joan Pasley, Iris Weiss
Published In: Center on Instruction
Published: 2008

Read Full Article: [Read Online](#)  [Download PDF File](#) 





ABSTRACT

"A debate continues over what constitutes effective science instruction. This brief endeavors to distill the research on science learning to inform a common vision of science instruction and to describe the extent to which K-12 science education currently reflects this vision. A final section on implications for policymakers and science education practitioners describes actions that could integrate the findings from research into science education."





Posted to Site: 09/18/2008

FIND RELATED ARTICLES



Search By This Article's Keywords

- MSP Key Features
 - Challenging Courses and Curricula 
- Ed Change & Policy
 - Science 
 - Standards 
- Teaching and Learning
 - Science 

Search By This Article's Authors

- Eric Banilower 
- Kim Cohen 
- Joan Pasley **
- Iris Weiss 

FIND OTHER ARTICLES

- Browse by Theme 
- Search in Library 

MSPnet Library: Find Related Research

[MSPnet Hub](#)
[TERC MSPnet](#)
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- ▀ Ed Change and Policy

- ▀ Teaching and Learning

- ▀ Professional Development

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- ▀ MSP Papers

- ▀ MSP Key Features

[Resources](#)
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Library Search

Author: "Joan D. Pasley"

Your search yielded: **4 results**

Posted	Title	Author	In / At	Pub Date	Comments	Vis
9/18/08	Effective Science Instruction: What Does Research Tell Us?	Eric Banilower, Kim Cohen, Joan Pasley, Iris Weiss	Center on Instruction	2008		Public
3/07/06	Lessons from a Decade of Mathematics and Science Reform: A Milestone Report for the Local Systemic Change Through Teacher Enhancement Initiative	Eric R. Banilower, Sally E. Boyd, Joan D. Pasley, Iris R. Weiss	Horizon Research	2006		Public
6/02/04	Looking Inside the Classroom: A Study of K-12 Mathematics and Science Education in the United States	Iris R. Weiss, Joan D. Pasley, P. Sean Smith, Eric R. Banilower, Daniel J. Heck	Horizon Research	2003		Public
6/02/04	What is High-Quality Instruction?	Iris R. Weiss, Joan D. Pasley	Ed. Leadership	2004	1	Public

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ABOUT MSPnet

MSPnet is created and

Lessons from a Decade of Mathematics Reform: A Capstone Report for the Local Systemic Change Through Teacher Enhancement Initiative

Authors: Eric R. Banilower, Sally E. Boyd, Joan D. Pasley, Iris R. Weiss
Published In: Horizon Research, Inc.
Published: February 2006

Read Full Article: [Download PDF File](#) 

ABSTRACT

"Lessons from a Decade of Mathematics and Science Reform: The Local Systemic Change Through Teacher Enhancement Initiative (LSC) presents the findings of a study of the content-focused teacher professional development. Results are based upon ten years of data, including questionnaires, observations, and interviews with teachers of science, mathematics, and/or technology engaged in the National Science Foundation-supported Local Systemic Change through Teacher Enhancement Initiative (LSC)."

Posted to Site: 03/07/2006

Lessons from a Decade of Mathematics and Science Reform

A Capstone Report for the Local Systemic Change through Teacher Enhancement Initiative

Eric R. Banilower
Sally E. Boyd
Joan D. Pasley
Iris R. Weiss

December 2006

Prepared For: The National Science Foundation
4201 Wilson Boulevard
Arlington, VA 22230

Prepared By: Horizon Research, Inc.
326 Cloister Court
Chapel Hill, NC 27514

Teaching and Learning

- Science

Search By This Article's Authors

- Eric Banilower
- Kim Cohen
- Joan Pasley
- Iris Weiss

FIND OTHER ARTICLES

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on

MSPnet Resources

The MSPnet Resource Center contains links to useful websites, MSP program information, policy updates, NSF and ED news, and the MSP Toolbox.

Welcome, the Hub connects all projects

Resources

MSPnet's Resource Center contains useful websites, materials, and news.

[Search for Resources](#)

Useful Websites (326)

Websites are divided into categories to assist you in finding helpful online resources. Please add to this rich collection by posting your own favorites for others to share.

- Organizations (99 items)
- Databases (21 items)
- Math Resources (101 items)
- Science Resources (180 items)
- Technology (57 items)
- Prof. Dev. (62 items)
- Standards (29 items)
- Assessment (22 items)
- Equity (25 items)
- Public Engagement (46 items)

MSP Toolbox (37)

Tools related to assessment, evaluation, and professional development are posted here. We encourage projects to share tools they have developed.

MSP Program Information

Essential notes and resources pertaining to the MSP program, as well as links directly to the MSP websites hosted by NSF and the Department of Education.

Policy Updates (28)

MSP Program policy updates are provided here.

NSF News (55)

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- Useful Websites
- MSP Toolbox Materials
- MSP Program Info
- Policy Updates
- NSF News
- ED News

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ABOUT MSPnet

MSPnet Resources



The screenshot shows the MSPnet website interface. At the top, there is a navigation bar with 'MSPnet Hub', 'TERC MSPnet', and 'My MSPnet'. Below this is a header for 'MSP Toolbox / Materials'. A sidebar on the left lists navigation options: Home, Showcase, Projects, People, Library, and Resources. The Resources section is expanded, showing a list of links: Useful Websites, MSP Toolbox Materials (highlighted), MSP Program Info, Policy Updates, NSF News, and ED News. The main content area displays a list of resources with columns for 'Posted' and 'Title'.

Posted	Title
2/24/10	Analyzing Change and Sustainability: Exercising MSP Projects
12/10/09	Modern Science Modules
8/05/09	STEM Research and Modeling Network (SRM)
5/21/09	LMT Mathematical Knowledge for Teaching (LMT)
4/07/09	Lesson Study Guides, Tools, and Resources
4/07/09	Database of Measures of Teachers' Mathematics Content Knowledge
4/01/09	Science Classroom Observation Protocol - Reference Edition
4/01/09	Professional Learning Community Observation Reference Edition
4/01/09	Supporting Student Success Guide
4/01/09	District Action Planning Tool: Improving Science and Teaching

MSP Toolbox & Materials Contains Resources useful for Professional Development, including:

Protocols, rubrics, measurement tools, assessment guides, and many other resources developed by the MSP community.

MSPnet: Voices from the Field



The screenshot shows the MSPnet website interface. At the top left is the MSPnet logo. To the right are navigation links: Log Out, Join, Contact MSPnet, and Help. Below these is a search bar with a 'Search' button and the text 'Advanced Search'. A horizontal menu contains 'MSPnet Hub', 'TERC MSPnet', and 'My MSPnet'. The main header area features the text 'Shay, the Hub connects all projects' and a large 'Speaker Hall' title. On the left side, there is a vertical navigation menu with categories: Home, Showcase, Projects, People, Library, Resources, Hub Working Groups, Voices from the Field (with sub-items for Speaker Hall and Poster Hall), Conferences, and Events. Below this menu is a section for 'ABOUT MSPnet' with logos for TERC and NSF, and a paragraph explaining the site's purpose. The main content area is titled 'Speaker Hall' and contains a descriptive paragraph: 'In the Speaker Hall, invited speakers and panelists offer video and audio presentations to the MSPnet community. Send us your suggestions for future topics or articles that you would like to see discussed.' Below this is a list of presentations, each with a small portrait of the speaker, the title, the speaker's name, and the event details. The presentations listed are: 'The Case for Ed Schools, and the Challenge' by Dr. Deborah Ball; 'Keynote Address' by Dr. Freeman A. Hrabowski III; 'Keynote Address' by Dr. Diana Natalicio; 'Just Like Pastrami' by Dr. Lee Shulman; 'Knowing and Using Mathematics in Teaching' by Dr. Deborah Ball; 'The Interaction Between the Science Content Knowledge of Teachers and Their Students' by Dr. Phillip Sadler; and 'Improvement Of Teaching At Scale' by Dr. Richard Elmore. On the right side of the Speaker Hall section, there is an image of a microphone in a lecture hall and a blue box with the text 'OPTIONS' and a 'Suggest a Speaker' button with a play icon.

MSPnet's Speaker Hall offers presentations from leaders in the field.

MSP Conferences Archive

Explore MSPnet's rich archive from 7 years of MSP Conferences.



MSPnet Hub

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MSP LNC 2010

MSP Learning Network Conference 2010

MSP: An Intergenerational Learning Network
 January 24-26, 2010
 Renaissance Washington Hotel
 999 Ninth Street NW, Washington, D.C.

OPTIONS

- Conference Information
- Conference Proceedings
- Video Archive
- Poster Hall
- Paper Session Presentations

Navigation Menu:

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- Conferences
 - MSP Conferences
 - RETA Workshops
 - STEM Conferences
- Events


The archive includes video of key speakers, slide presentations, transcripts, virtual poster halls, and breakout session summaries.


MSP LNC 2010

2010 MSP Learning Network Conference - Video Archive


Dates: January 24-26, 2010
Location: Washington, DC

Monday, January 25th 2010

 **Keynote: Embedding Math and Science Partnerships in Community Collaborations**
 Nancy Zimpher, Chancellor, State University of New York System

 **Keynote Panel: STEM - Delivering on the Promise**
 Moderator: Patricia OConnell Johnson
 Panelists: Michael Lach, James Shelton

Tuesday, January 26th 2010

 **MSP Program: A Research and Development Effort**

MSP News

MSPnet's weekly newsletter brings you recent research in the field of STEM education, and keeps you up-to-date on the latest news from the MSP program.

MSP News

April 29, 2010

Dear Emma Speenet,
This weekly newsletter is sent to you by MSPnet.org, the online learning network and resource center funded by NSF to serve all MSP programs.



NEWS IN BRIEF

1. NEW IN LIBRARY

A. "[Breaking the Cycle: An International Comparison of U.S. Mathematics Teacher Preparation](#)," The Center for Research In Math And Science Education Michigan State University, 2010.

B. "[Improving State Need Assessments of Secondary Science and Mathematics Teachers: Challenges, Possibilities, and Recommendations](#)," Michael B. Allen, Science and Mathematics Teacher Imperative, Association of Public and Land-Grant Universities, March 2010.

C. "[The Cost of New Higher Quality Assessments: A Comprehensive Analysis of the Potential Costs for Future State Assessments](#)," Barry Topol, John Olson, Ed Roeber, Stanford Center for Opportunity Policy in Education, 2010.

2. PROJECT NEWS

A. MSP-KMD: [UPDATED Knowledge Reviews](#)

The MSP-Knowledge Management and Dissemination (KMD) project announces the publication of updated Knowledge Reviews on developing and supporting teacher leaders. See details below.

We Welcome Your Participation...

MSPnet Guest Membership

Visit <http://mspnet.org> to sign up for the weekly *MSP News* e-mail.

Members of MSP Projects

For log-in help, send email to contact@mspnet.org.

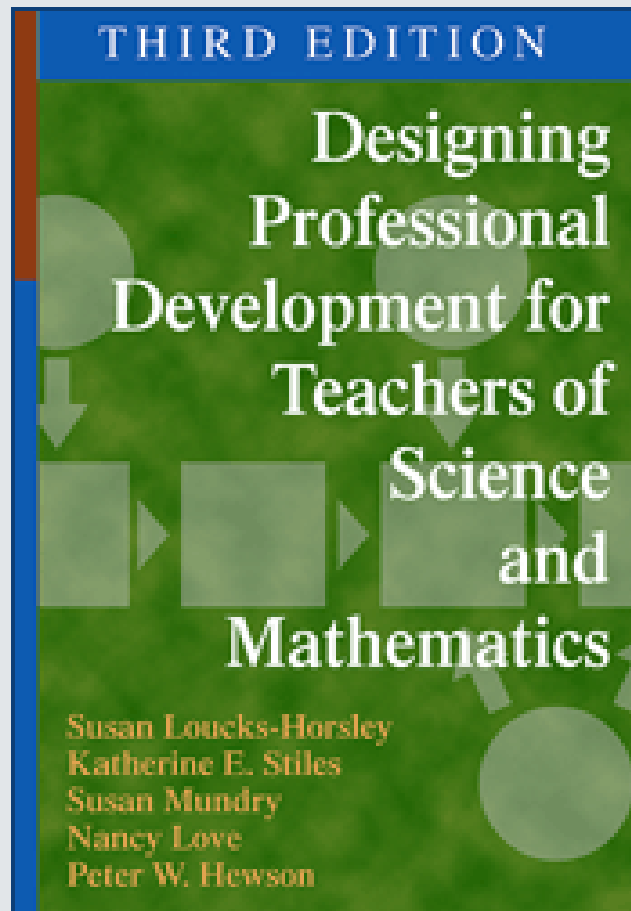
Contact Us

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Shay_Pokress@terc.edu

Resources

Resources



- Includes a planning framework
- Describes a variety of professional development strategies

Loucks-Horsley, S., Love, N., Stiles, K. E., Mundry, S., & Hewson, P. W. (2009) *Designing professional development for teachers of science and mathematics*. (3rd ed.). Thousand Oaks, CA: Corwin Press.

MSP KMD Cases

- Perspectives on deepening teacher content knowledge
- Sustained impact
 - **Focus on teacher content knowledge**
 - **Focus on teacher leadership**

Strategic Leadership Handbook

- Precursor to MSP KMD project
- Addresses
 - Designing interventions
 - Garnering stakeholder support
 - Aligning policy
 - Developing capacity for scale up

Weiss, I. R., Miller, B. A., Heck, D. J., & Cress, K. (2004). *Handbook for enhancing strategic leadership in the math and science partnerships*. Chapel Hill, NC: Horizon Research, Inc.

TE-MAT

- Conceptual framework highlights key elements critical to the design and implementation of effective PD programs
- Searchable database of reviews of PD materials

TE-MAT

Searchable by:

- Grade level
- Purpose: (e.g., deepening teacher content knowledge, understanding student thinking)
- Format (e.g., print, software, video)
- Topic (e.g., chemistry, pre-algebra)

Key Take-Away Ideas

Understand the system you are trying to change

- Every system is perfectly designed to get the results it gets. (Michael Patton)
- To change the results, you need to change the system, i.e., the guidance and/or incentives for teachers, administrators, STEM faculty.

Patton, M. Q. (2005, September). *Evidence-based evaluation findings using systems change and complexity science frameworks and ways of thinking*. Paper presented at the MSP Evaluation Summit: Evidence-Based Findings from the MSPs, Minneapolis, MN.

Make your theory of action explicit

- Be clear about how your plan is expected to make a difference
- Include outcomes you expect the PD to have in the short term **and** how those fit into a plan for on-going improvement.

Recognize that you can't do it all

...At least not all at once

- Be strategic in deciding what to do first, second, and third.
- But be willing to redesign to get around obstacles and take advantage of opportunities that arise.

Consider how you will reach all teachers

- Need to go beyond the “institute junkies” so that all students will benefit.
- But don’t want to sink resources into trying to change teachers who are committed to not changing.
- And need to consider how to deal with teacher (and administrator) turnover.

Don't let form trump substance

- Choose PD strategies that will help achieve your purposes, rather than choosing the latest strategies and seeking purposes for them.

Be realistic

- Choose PD strategies that fit the resources and capacity you have (or can develop) to provide high quality professional development

Avoid reinventing the wheel

- Use existing high quality professional development materials if available.
- More available in mathematics than in science.

Design PD to facilitate transfer to the classroom

- Point out connections between what teachers are learning and what they are expected to teach.
- Help teachers apply what they are learning to their classrooms, with opportunities for practice and feedback.

Trust but verify

- Program designers need to monitor to see if the PD is being implemented as designed, especially during scale up.

Base decisions on the best evidence available

- Base your initial design on evidence of likely impact in your context.
- Use evidence to assess progress and determine if changes are needed to the design and/or the implementation.
- Use evidence of impact to help get buy-in for on-going PD.

Finally...

- Please complete the conference evaluation.