MSP Knowledge Management and Dissemination Project

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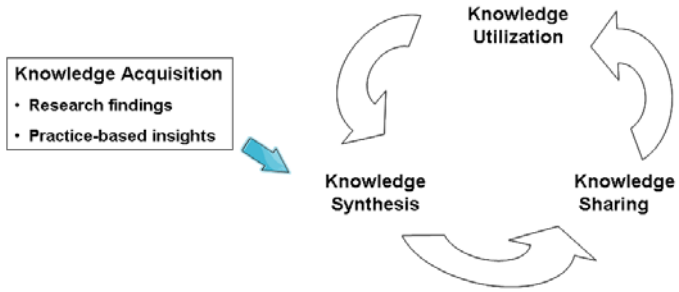
Overview

Math and Science Partnership (MSP) Knowledge Management and Dissemination (KMD) was funded as an MSP Research, Evaluation, and Technical Assistance (RETA) project to support knowledge management within the MSP program and to disseminate information to the broader mathematics and science education community. A partnership of Horizon Research, Inc., Education Development Center, and WestEd, the overall goal of the KMD project is to synthesize findings in the K–12 arena in a small number of important areas, articulating the contribution of the MSP program to the knowledge base and identifying "gaps" and promising practices/strategies for further investigation. In this way, MSPs and the field at large can benefit from MSPs' research and development efforts.

The KMD project collects, evaluates, codifies and disseminates MSP-relevant knowledge to current and future MSP awardees and others. A knowledge acquisition component includes both empirical research findings and practice-based insights. KMD locates existing research relevant to MSP projects; analyzes empirical research studies (quantitative and/or qualitative) to identify methodologically-sound findings; and describes the apparent generalizability of these findings. Practice-based insights are collected via interviews and online panels. The results are shared in forms that are accessible to current and future MSP awardees. The results of this work are useful to MSP projects and the broader field.

Knowledge Management Framework



Adapted from Nevis, E.C., DiBella, A.J., & Gould, J.M. (1995). Understanding organizations as learning systems. *Sloan Management Review, 36*(2), 73–86.

Standards of Evidence

The KMD project developed a Standards of Evidence review process to determine the strengths and contributions of various empirical research studies. The Standards of Evidence review includes six major categories with indicators for each category. The six categories are:

- Adequate Documentation of Project Activities
- Internal Validity
- Analytic Precision
- Generalizability/External Validity Determination
- Overall Fit
- Warrants for Claims

For more detailed information about Standards of Evidence please refer to the paper " Applying Standards of Evidence to Empirical Research Findings: Examples from Research on Deepening Teachers' Content Knowledge and Teachers' Intellectual Leadership in Mathematics and Science" prepared for the March 2008 meeting of the American Educational Research Association and available on the KMD website.

Online Practitioner Panels

In order to collect, interpret, and analyze practice-based insights, the KMD project used a modified Delphi Panel method. The project assembled a panel of MSP project leaders and other experts with experience and expertise related to topics that the project was investigating. These experts responded to up to four rounds of questions and statements about a particular topic.

Through an iterative process, responses to questions and statements were analyzed in order to formulate the next round of questions. Insights, based on practice, resulted from the panels and can be found in Knowledge Reviews on the KMD website.

- Through multiple rounds, experts were asked to:
- Reflect on a statement about a practice;
- Identify important conditions for achieving the purpose of a practice; and
- Formulate advice to the field about a practice.

For more detailed information about the Online Practitioner Panels please refer to the paper "What Do We Know and How Well Do We Know It?: Identifying Practice-Based Insights" prepared for the March 2008 meeting of the American Educational Research Association and available on the KMD website.

KMD Website

The MSP KMD project website is **www.mspkmd.net** and contains the following.

Knowledge Reviews

Based on findings from research and insights from practice, knowledge reviews provide guidance to practitioners in the areas of deepening teacher content knowledge, teacher leadership preparation and practice, and the involvement of STEM disciplinary faculty in the work of deepening teacher/teacher leader content knowledge. Each knowledge review offers opportunities to react to the practice-based insights described, provide additional insights in the particular topic area, and share examples of practice. Knowledge Reviews:

- Deepening Teacher Content Knowledge (N=11)
- Developing and Supporting Teacher Leaders (N=10)
- Involving STEM Disciplinary Faculty in the Work of Deepening Teacher/Teacher Leader Content Knowledge (N=5)

Database of Measures of Teachers' Content Knowledge

The Instrument database provides researchers and practitioners with information about measures of teacher content knowledge used in empirical research, including research conducted by MSP projects. There are currently 144 instruments in the database. Instruments can be searched by:

- Subject
- Type of knowledge (disciplinary, pedagogical content, ways of knowing)
- Nature of assessment items (selected response, constructed response, other)
- Grade levels of teachers studied

Database includes:

- Descriptions of instruments (but not the instruments themselves) and their availability;
- Scoring information; and
- Validity and reliability information (when available).

Presentations and Papers

Presentations and papers related to the work of the MSP KMD project can be accessed on the website. Topics include applying standards of evidence to research-based findings, identifying practice-based insights, and utilizing what is known from research and practice.

Successes

- Generating knowledge through the use of both online practitioner panels and a system for conducting reviews of empirical research intended to ensure a transparent process with integrity and protections against bias in all phases
- Articulating the various perspectives on deepening teacher content knowledge (see KMD website for a Knowledge Review on the Perspectives on Deepening Teacher Content Knowledge)
- Documenting use of credible, replicable, and useful processes for knowledge generation in mathematics and science education (e.g., practitioner panels, standards of evidence reviews)
- Disseminating products with evidence of quality: Knowledge Reviews and Teacher Content Knowledge Instrument Database

Challenges

- Empirical research tends to be scattershot and focused more on program evaluation, limiting what is known about the relative contributions of specific approaches/ interventions.
- The web-based KMD products are not being used as widely as we had hoped. How can KMD disseminate what is known about teacher content knowledge and developing and supporting teacher leaders to both MSPs and the broader field?
- The KMD processes are replicable and useful, but the resources to delve into just one area are great. Are there ways to streamline the process without sacrificing quality?

Contribute to KMD

- Add insights and examples from your MSP experiences online at http://www.mspkmd.net/blasts.
- Submit an instrument for the database of measures of teachers' mathematics/science content knowledge by emailing msp-kmd@mspkmd.net.
- Share your research on deepening teacher content knowledge and developing teacher leaders by emailing us at msp-kmd@mspkmd.net

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