What Do We Know and How Well Do We Know It?: Identifying Practice-Based Insights

For the AERA symposium: What Do We Know and How Well Do We Know It?: Methodology for Synthesizing Knowledge

Barbara Miller
Education Development Center

Acknowledgments

This report represents the efforts of several individuals and organizations. In addition to the authors of this report, many Knowledge Management and Dissemination staff at Horizon Research, Inc., Education Development Center, Inc., and WestEd were responsible for various tasks essential to the production of this paper.

Introduction

In an era where the persistent call is for research-based strategies, evidence-based outcomes and data-driven decision-making, it is easy to equate research, evidence and data with a certain kind of knowledge: empirical knowledge. Yet, more often than not, some of the most important decisions made in educational settings and some of the most persuasive evidence for reform are drawn from practice. This paper takes seriously the pervasiveness and the power of knowledge derived from practice and discusses a methodology by which practice-based insights might be systematically collected, analyzed, and interpreted, so that they can be credibly held next to what is known from empirical research.

As a field, education has long held that knowledge derived from practice is valuable. Indeed, some have argued that craft knowledge (Barth, 2006) or professional knowledge (Shulman, 2004) – what we describe as knowledge from practice – constitutes the bulk of knowledge in education, and to demean or dismiss such knowledge would leave the field with a very weak knowledge base. Shulman (1987, 2004) refers to the "wisdom of practice" within education, as knowledge grounded in the action of teaching and learning, and distinguishes it from educational research and scholarship. Shulman credits Hawkins (1966) with the term "wisdom of practice". Shulman noted that Hawkins "argued that there are times in human history when there is much more wisdom in practice than in the academy, when gamblers know more about probability than statisticians, and when sailors know more about the heavens than astronomers [Hawkins, 1966, 3-12]. He claimed, and I think correctly, that we are probably at a time in the history of education when there is more, and indeed a distinctive, wisdom about teaching among practicing teachers than there is among academic educators" (Shulman, 2004, 505).

Despite the prevalence in education of "wisdom of practice" or what we understand as practice-based knowledge, this kind of knowledge is not typically treated with the same kind of rigor as empirical or educational research, with regards to how that practice-based knowledge is collected, analyzed and interpreted. Or, practice-based knowledge is held to the same standards as empirical research and, as a result, consistently found lacking.

We argue that the issue is articulating a systematic methodology for practice-based knowledge. In doing so, we situate that methodology in qualitative research paradigms. Many have described and advocated for qualitative research paradigms as appropriate for "naturalist" research (Wolcott, 1982) of a "field" situation, with the goal of gaining a "holistic" overview of the context under study, where a central task is to "explicate the ways in which people in particular settings come to understand, account for, take action and otherwise manage" their situation (Miles & Huberman, 1994, 5-7). This means studying things "in their natural settings, attempting to make sense of, or interpret, phenomena in

terms of the meanings people bring to them" (Denzin & Lincoln, 1998, 3). This would include causal explanations (Maxwell, 2004). Collecting, analyzing and interpreting practice-based insights means understanding the significance, meaning, and causal explanations that practitioners bring to their experience, so as to make it accessible and useful to others as knowledge.

Central to a qualitative research paradigm is systematic data analysis, so that a clear and rigorous process is used in the analysis of qualitative data. This involves the use of both categorizing and connecting strategies (Maxwell & Miller, 2008). Practitioners' practice-based knowledge has significance because of the similarities and difference that can be discerned among data from various practitioners (i.e., using categorizing strategies, such as coding and sorting). It also has significance because of the contiguity-based relationships that "emphasize connections between things" (462) by "identifying key relationships that tie the data together into a narrative or sequence and eliminating information that is not germane to those relationships" (467).

Moreover, there are increasing calls for attention to "problems of practice" within education, so that the objects of inquiry are closer to the work of educators. While it is certainly true that empirical research can focus on problems of practice, we believe that it is both possible and informative to make careful use of knowledge from practice – or what we call practice-based insights – to understand and resolve problems of practice.

Thus, we argue in this paper that there is value and need for practice-based knowledge to answer questions of importance in the field, as well as value and need for a systematic methodology for collecting and analyzing that practice-based knowledge so that it will be understood as credible and valid.

The MSP Knowledge Management and Dissemination Project

The methodology for collecting, analyzing and interpreting practice-based insights was developed as part of the Mathematics and Science Partnership Knowledge Management and Dissemination (KMD) project. This project is funded by the National Science Foundation through its Mathematics and Science Partnership (MSP) initiative, which brings together institutions of higher education, school districts and other partners for the purpose of improving K-16 mathematics and science education. The KMD project was funded to support knowledge management within the MSP program and to disseminate information to the broader mathematics and science education community. The overall goal of the KMD project is to synthesize findings from MSP work and integrate them into the larger knowledge base for education reform.

The KMD project is investigating a set of topics that are of importance to the MSP community, as well as to the broader mathematics and science community

and both communities would be the sources of knowledge on these topics. The topics include deepening teacher content knowledge and developing and using teachers as intellectual leaders. The discussion in this paper draws upon project work in these topics.

The charge of the KMD project is to identify what is known for each of these topics, and assess the confidence and depth to which that knowledge is held. While empirical research knowledge about each topic is clearly important and valuable, we also wanted to attend to what we know from practice. To do that, though, we needed a systematic methodology.

Methodology

As discussed elsewhere (Heck, 2008), we articulated, tested, and utilized an explicit and rigorous process for collecting and analyzing empirical research findings from published studies. We saw that similar explicitness and rigor could be applied to a process for collecting and analyzing practice-based knowledge – what we call practice-based insights – from experienced practitioners. To that end, we articulated a methodology that specified sampling, data collection strategies and a data analysis framework, as well as threats to validity and measures taken to address those threats.

A primary strategy for collecting and analyzing knowledge from practice that we used in the KMD project was online practitioner panels. These were supplemented by interviews from key MSP leader and by examples and input from practitioners through on-line discussion boards and focus group reflections, allowing for data triangulation. Discussion in this paper, however, will be limited to the online practitioner panels as a robust strategy by which to systematically collect and analyze knowledge from practice.

Practitioner panels are not a unique data collection strategy. Delphi panels have been used in many fields to elicit knowledge from expert practitioners, particularly in circumstances where there is uncertainty around the nature of a problem or its potential outcomes. Delphi panels are used (e.g., Kingsley & Waschak, 2005; Hauck, 2007; Wen & Shin, 2008) to create recommendations for responses in particular situations. The online practitioner panels used in the KMD project are a variation of the Delphi panel strategy. While sharing several similarities with Delphi panels, such as the use of experts and multiple rounds, with the practitioner panels in the KMD project we were less focused with identifying the most likely outcome in certain situations as with identifying those conditions and features tied to the efficacy of particular strategies. We found the practitioner panel to be both efficient and effective in terms of gathering knowledge about a topic of interest.

<u>Illustration</u>   Before discussing the methodology in detail, we want to provide an illustration of an online practitioner panel used in investigating one of the topics of interest in the KMD project: teacher leadership. Nine practitioners comprised the first teacher leadership practitioner panel. These practitioners had extensive experience in design, implementation and/or support of teacher leader programs; research into teacher leadership in multiple settings; and/or evaluation of teacher leadership programs or efforts in multiple settings. Each panelist responded individually, in writing, to a set of questions and statements about teacher leadership. The responses of all panelists were analyzed, and the results used to frame the next round of questions and statements to the panelists. This process continued for a total of four, iterative rounds of questions and statements.   Over the course of four rounds of questions, project staff had the opportunity to test out emerging consensus with panelists, clarify areas of apparent disagreement, articulate agreed-upon meanings and illustrations for particular phenomenon, and probe for the extent of the panel's shared knowledge, derived from their experiences, about different aspects of teacher leadership.

This, and other practitioner panels, were more efficient than focus groups for eliciting and testing out agreement around ideas, more effective than individual interviews in building consensus across a sample of practitioners, and more useful than surveys in situating and illustrating experience in particular examples. The results of the KMD practitioner panels for teacher leadership and teacher content knowledge were a set of insights about particular aspects of each topic, qualified with regards to the limits of what is known or where additional work is needed to achieve greater consensus, and accompanied by practitioners' examples.

Sampling

There is a vast population of practitioners with experience relative to the topics that we were investigating in the KMD project, thus it was imperative that we have a clear sampling strategy and that we know the limits of that sampling strategy. Part of the appeal of practice-based knowledge is that it is so widespread, held by various kinds of practitioners and derived from different kinds of experience. This is also part of what makes it challenging to collect practice-based knowledge systematically.

<u>Sampling strategy</u>
We used purposive sampling to construct the practitioner panels, based on potential panelists' prior experiences with the topic. We identified panelists who had different kinds of experience (as evaluators, as researchers, as designers or implementers of work in these areas) and attempted to balance the sample with regard to the different perspectives or nature of experience these practitioners would bring. In selecting panelists, we focused on practitioners who had both

experience and expertise, using a distinction made by Elmore (2002) that "while expertise exists, matters, and can be improved, it is not true that experience equals expertise" (17). One might have extensive experience, but may not have had the opportunity to articulate it as expertise, or knowledge derived from that experience.

In the panels constructed for investigation of teacher leadership and teacher content knowledge, we constructed a sample of those who design for, work with, evaluate and/or research programs of teacher leadership or teacher content knowledge. We saw these individuals as those who would have both experience and expertise. A different kind of panel would consist of classroom teachers, or those who were the participants of programs of teacher leadership or professional development to deepen teacher content knowledge. By being clear about the purposeful way in which a panel was constructed, we can then consider how and in what way claims made from this sample are warranted. Moreover, it means that subsequent panels (or other data samples) could be constructed differently or systematically varied.

In the investigation of teacher leadership, as seen in the illustration above, we identified panelists who had extensive experience in teacher leadership. By extensive, we meant either experience in multiple settings (i.e., experience with teacher leadership in more than four schools, districts or programs) or in multiple iterations (i.e., experience with teacher leadership in more than four versions or manifestations in a single setting, like a district). We tried to balance the sample with regard to the nature of experience (i.e., from research, evaluation, design/implementation/support of teacher leadership), across content area and grade levels. See table 1.

The same kind of sampling criteria were used in the practitioner panel for teacher content knowledge. For these panels, the attempt was to balance the panel with regard to the perspective held on deepening teacher content knowledge in mathematics or science. For example, some people believe that disciplinary content knowledge needs to come first for teachers, arguing that teachers need to know the content before it makes sense to engage them in thinking about classroom applications of that knowledge. Others argue that it is important to start by focusing on classroom applications, e.g., engaging teachers in the analysis of student work, so teachers have a context for, and understand the importance of, deepening their disciplinary content knowledge.

In the initial round of the panel, panelists were asked to provide data about the quantity, nature and focus of their experiences, both in terms of quantifying their experiences (e.g., number of experiences working with different teacher leadership programs), characterizing their experiences (e.g., at which grade levels, in particular settings), and offering multiple examples of their experience. This allowed us to test our assumptions about the kind of experience panelists would bring to the panel. The great majority of panelists reported having the

breadth and depth of experience that we had expected that they would bring, when they were invited to be part of a panel.

Keeping the sample "honest"
In addition, panelists were asked to indicate the extent of their experience with the statements that were put in front of them, and not to respond to questions or prompts if they did not have direct and relevant experience. While one could argue that practitioners with rich experience could extrapolate to situations in which they didn't have direct experience, we wanted panelists to respond from their experience and not their opinions. In this way, the number of panelists responding to a particular question or statement was not the same across the entire set of questions in a panel round. If 40% or more of panelists reported no direct experience with a question or statement, then that question or statement and any data collected thus far was set aside.

For both teacher leadership and teacher content knowledge, two different panels were used in investigating each topic, allowing for triangulation of data across panels. This meant that the sample for each panel could be constructed somewhat differently, testing out in the second panel whether insights gathered in the first still held. At the end of all rounds for given panel, the panelists received a stipend for their participation.

Data Collection

Practice-based knowledge is rooted in and derived from experience, and this poses particular challenges for data collection. Typically, practice-based knowledge is shared informally among practitioners, or organized idiosyncratically, depending on who is reflecting on and communicating the knowledge. Practice-based knowledge is often associated with what an individual knows, in a particular context. While an individual practitioner may draw conclusions from his/her experience and generalize to other contexts, rarely is there the effort made to accumulate and test out practice-based knowledge across practitioners and contexts.

Panel structure and process
Panelists were asked to respond online to iterative rounds of questions posted using survey software. Each panelist submitted responses individually without knowledge of the other panelists' responses during that round. This meant that a panelist could respond from his/her own experiences, without framing responses to speak to or anticipate the ideas of other panelists. The panel operated asynchronously, so that a panelist could respond at a time that was best for him/her, presumably with sufficient time for reflection. Based on information provided by panelists, each round of questions took a panelist an average of four hours to complete, and most panelists reported that they completed the questions in more than one sitting. Each round of questions was available online

to panelists for an average of 17 days, and the majority of panelists submitted their responses within that window of time. The remainder submitted responses within an additional two to three days.

If a panelist was unable to complete a round, even with an additional few days, the panelist (and data acquired to date) was removed from the panel, so that analysis of data in between panel rounds could proceed. In each of the two teacher leadership panels, one panelist dropped out during the first round; no panelists dropped out of the teacher content knowledge panels. After the first round, there was no further attrition from any of the panels.

Panelists did not know each other's identity, so as to minimize the influence on others which a panelist's reputation or prior work might bring, and to limit the amount of extrapolation a panelist might ascribe to other panelists' comments when played back in later rounds. The identity of all panelists was shared after the conclusion of the rounds of the panel, although the specific comments or examples were not identified as belonging to a specific panelist.

A panelist was given a password to enter and work within the system, and had access to his/her responses from previous rounds. While panelists were given the option of downloading the round of questions and submitting it to KMD staff as a word file with their responses, all panelists after the first round of the panel completed the questions on-line.

Two different panels were conducted for each topic investigated. For the teacher leadership topic, the first panel ran for four rounds; the second panel for two rounds. The second panel explored a small number of new topics, compared to the first panel, and was primarily focused on confirming or extending the insights gathered from the first panel and providing illustrative examples. A similar strategy was used for two panels for the teacher content knowledge topic.

Item types
The items that panelists responded to in each round were a mix of closed response survey items, open-ended survey items, and open-ended interview questions. These items were grouped within each round, to address a particular aspect of the topic. With teacher leadership, three major areas were pursued: teacher leader selection, teacher leader preparation and support, and teacher leader practice. Each of these areas was broken into a number of specific items for panelists. The greatest variety of items, across these three areas, was presented in the first round; in subsequent rounds, fewer aspects of teacher leadership were pursued, but in greater depth.

The responses to each round of questions were analyzed by project staff, with subsequent rounds of questions informed in part by emerging themes and ideas from panelists' data.   Panelists were asked to provide examples from his/her experience to illustrate their responses to questions. These included positive

examples (e.g., where a strategy was effective) and negative or counter examples (e.g., where a strategy did not work).

Across the rounds of the practitioner panel, three strategies were used to elicit and test insights about promising practices:
1. Panelist reflects on a *statement* about a particular practice by indicating the extent to which a stated purpose for that practice was evident in situations in which s/he has experience; giving his/her hunch about why this practice worked/didn't work for the stated purpose in various settings; and providing an example if s/he has seen this practice implemented (successfully and/or unsuccessfully).
2. Panelist reflects on a set of *conditions* (elicited from the first strategy) most often noted as important by rating each condition as essential, helpful, or not helpful in achieving the purpose of the practice; commenting on each condition; and suggesting additional conditions that appear to influence the effectiveness of the specified practice.
3. Panelist reflects on a summary (elicited from the second strategy) about the extent to which various conditions are essential in order to realize a particular purpose for a practice by commenting on the summary in the form of *advice to the field*; and responding to additional conditions that might get added to the advice to the field.

The movement from panelists' reflections on a statement in one round, to reflections on a set of conditions in a next round, to reflections on a summary framed as advice to the field in a third round, is seen in Figures 1-3. As seen in Figure 1, a panelist reflects on a particular statement (here, item 10a, regarding the particular practice of demonstration lessons used by a teacher leader to provide support to a classroom teacher). The reflection is framed around a series of prompts, beginning with the panelist assessment of the extent of his/her experience with the particular practice. This is part of keeping the sample "honest", so that a panelist is drawing on his/her direct experience. Other prompts ask the panelist to reflect on why the practice works, and examples of successful and unsuccessful use of the practice. These reflections provide data from which to elicit conditions for the practice. In this case, each panelist was reflecting on reasons why, illustrated with examples from his/her own experience, the practice of demonstration lessons worked for the purpose of improving instruction.

In the next round of the panel, the second strategy of panelists reflecting on a set of conditions, was used. These conditions were constructed from the responses of individual panelists. As seen in Figure 2 (again, continuing with the particular practice of demonstration lessons), a panelist sees how the original statement was reframed and which conditions are emerging as essential for the practice of demonstration lessons. The panelist is asked to respond to a series of prompts, beginning with an assessment of his/her experience with demonstration lessons, and then proceeding to consideration of each of eight conditions. The panelist is

asked to rate the importance of the condition and to comment on the condition. Panelists typically offered comments on conditions, particularly if the condition were rated "helpful, but not essential" or "not helpful".

In the next round of the panel, the third strategy of panelists reflecting on a summary, framed as recommendations or "advice to the field", was used. This advice was constructed from the ratings and comments on conditions. As seen in Figure 3 (still continuing the particular practice of demonstration lessons), a panelist sees the advice to the field in its entirety, with the extent of agreement among the panel represented in terms of conditions considered essential as opposed to helpful. Not all conditions from the prior round are in the advice to the field, based on the input of the panelists about which were essential, helpful or not helpful. Where there was still disagreement about whether a condition was essential or not, or where it was unclear about the meaning ascribed by particular panelists to a condition, panelists were asked to reflect on potential additions to the advice to the field.

This process of moving from reflections on a statement to identification of conditions to advice to the field meant that a panelist had multiple opportunities to reflect, extend, and challenge his/her experience or the experiences of other panelists (as represented in items in subsequent rounds). In playing back responses in subsequent rounds, we noted the extent of emerging agreement and highlighted ideas around which there was disagreement or divergent experience held by more than 25% of the sample.

In investigating teacher leadership, the panels explored a total of twenty one teacher leadership statements, one of which was the demonstration lesson statement shown in figure 1. Some statements did not move beyond the first strategy (i.e., reflections on a statement), because there was insufficient experience with the topic among panelists or because panelists did not find the topic to be critical or compelling. Between the two practitioner panels investigating teacher leadership, we pursued thirteen statements through each of the three strategies, resulting in practice-based insights articulated as advice to the field. See table 2 for the summary of statements initiated followed through to advice to the field. A comparable number of topics were pursued in the investigation of teacher content knowledge.

Data Analysis

The meaning and significance of practice-based knowledge does not necessarily travel hand-in-hand with the accumulation of experience by practitioners. Many practitioners, highly skilled and knowledgeable, act from a rich experiential base to shape their actions. They may not, though, be able to analyze and interpret that knowledge, for themselves much less with and for others. The process of data analysis, during the course of data collection, was a critical part of this

methodology, in that ongoing analysis supported practitioners in reflecting on and responding to themes, emerging consensus and persistent differences.

Analytic framework
Analysis of data and, indeed, the content of the items put in front of panelists, are grounded in a conceptual framework about the topics under investigation. In the teacher leadership panels, this framework speaks to the relationship between the selection, preparation and practice of teacher leaders. See figure 4. While these can (and often are) treated as discrete activities, the power of teacher leadership to effect change or improvement in teachers' practice (which we would claim is central in teacher leadership programs) comes from the ways in which each of these domains are related.

Teacher leadership selection involves consideration of the qualities and experience desired in candidates as well as what the pool of potential candidates might be. How teacher leader practice is conceived, in terms of the kinds of practices teacher leaders are expected to carry out and the outcomes desired, influences teacher leader selection in terms of framing the particular qualities or experience that is sought. How teacher leaders are prepared, in terms of training before or at the outset of their practice or as ongoing support and development during their practice, influences teacher leader selection in terms of distinguishing between what teacher leader candidates should bring to their work versus what they can learn once they have been selected. The relationship between teacher leader selection, preparation and practice was present in the items presented to panelists, and in the analysis of data collected from panelists in each round of the panels.

In the teacher content knowledge panels, different perspectives on the meaning of teacher content knowledge framed the items put in front of panelists and structured the analysis. The relative importance people place on teachers having disciplinary content knowledge, pedagogical content knowledge, and understanding of ways of knowing in the discipline influences particular practices that are used to deepen teacher content knowledge and shape desired outcomes. Use of these perspectives as lenses was particularly important in the analysis of panelists' responses.

The iterative rounds of data collection and analysis provided opportunities – with panels for both teacher leadership and teacher content knowledge – to test out whether differences among panelists were due to different perspectives, different experiences, or both, and to distinguish among these differences. Asking for clarification or extension of ideas allowed us to test whether differences were due to misunderstandings or different interpretations.

Analysis strategies
Data analysis was ongoing during the data collection period. Analysis of the first round of panel responses was done in order to frame the second round of

questions and statements, an iterative process that continued through all rounds of a panel. Use of the three strategies (reflecting on a statement, reflecting on conditions, reflecting on advice to the field) led to a purposeful accumulation of data and vetting of emerging themes. The goal in data analysis was to identify and verify those ideas that could hold up among panelists as advice to the field, meaning that they were ideas that panelists largely agreed were important for the practice under discussion.

In each round of the panel, each item produced a data set that was analyzed. For example, as seen in figures 1, 2 and 3, data about demonstration lessons as a particular teacher leader practice was analyzed. This was done primarily through coding as a form of data reduction, looking for similarities and differences across panelists. Project staff constructed a simple thematic coding scheme for analysis of each item in each round, as well as tracking the sample size (based on the number of panelists with experience around an item) for each item and the strength of agreement (e.g., the ratings that panelists provided for an item). In addition to the reflections that panelists offered in comment boxes in each round of the panel, the examples that panelists provided were treated as data to be coded. In addition, these examples were analyzed as short narratives of particular practices in terms of the relationships illustrated or explicated. Connecting strategies (Maxwell & Miller, 2008) were identified, in terms of conditions that related to one another. This was particular important in order to arrive at advice to the field. While the advice to the field could be read as discrete features of, for example, use of demonstration lessons by teacher leaders, there is meaning in how these features related to one another as an overall discussion of the practice of demonstration lessons.

Currently, the KMD project is sharing the results of the efforts to systematically collect, analyze and interpret practice-based insights, drawn primarily from on-line practitioner panels, in the form of knowledge reviews for the MSP community. While these knowledge reviews also contain what is known from empirical research, it is the display of practice-based insights for a particular topic that is of relevance to this paper. For example, the KMD knowledge review of teacher leaders providing classroom support to teachers through demonstration lessons or modeling (Miller, Schiavo & Busey, 2008) shows advice to the field organized as discrete features, but with references to the relationship between features.

<u>Analytic precision</u>
Data from each round of panel responses were coded by project staff. Agreement on a coding scheme was determined prior to data analysis (or after analysis of small set of data), with one staff responsible for coding all data for an item and another staff reviewing and checking the coding and interpretations drawn. Responsibility for coding was shared among project staff (i.e., one staff would code half the data, and act as reviewer on the remainder of the data coded by the other staff member). Inter-coder reliability was not established for the

coding schema, but inconsistencies in coding or interpretation were identified and resolved among project staff. Construction of the advice to the field (the final strategy used in this methodology) was done by one staff member, with review by another staff member with access to the data used to construct the advice to the field. Cut points were established to distinguish among essential versus helpful conditions for a particular practice. Typically, we looked for at least 75% of the panelists to concur that a condition was essential or helpful, though many conditions had greater agreement among panelists.

We gave careful consideration to differences among panelists in each data set. These differences were usually presented back to panelists, to check on meaning ascribed and extent of support. Differences that persisted, even after successive rounds of data collection and analysis, were presented as part of the advice to the field and highlighted as areas meriting additional attention.

Validity threats and generalizability

Any methodology has validity threats, and this is particularly true with a new methodology where the intention is to be systematic with regard to sampling, data collection and data analysis. With this methodology, we identified and addressed three specific validity threats, and carefully considered the limits of generalizability of these data.

Validity threat 1: the persuasiveness of a well-argued response
In collecting and analyzing practitioner knowledge, expressed in written form, we were mindful that a small number of well-argued and well-supported responses from only a few panelists could carry more weight in a data set. Guarding against drawing generalizations about the experience of all panelists regarding a particular practice based on the cogency of responses from a few, we coded responses by panelist and tracked the extent of agreement on small units of data (e.g., agreement around a particular condition for the practice of demonstration lesson) across panelists. If a particular response was held only by a minority of panelists, we would offer it the entire panel in a subsequent round to assess whether others concurred. While we made use of a well-argued and well-supported response for illustrative purposes, we were careful to track the extent of support among the entire panel.

Validity threat 2: accounting for disagreement
In collecting and analyzing data from panelists with a variety of experiences, we were mindful of when we concluded that there was disagreement among responses or labeled data as divergent (i.e., a response that was idiosyncratic). Our purpose was to understand and explicate practitioners' knowledge, and disagreement (particularly strongly expressed disagreement) represented data to be taken seriously. Through analysis and iterative rounds of data collection we were working to identify agreement among the panel, rather than create

agreement, either by abstracting an idea until consensus could be reached or setting aside ideas where there was disagreement. Thus, we held on to responses which disagreed with what others had to say for more than one round of data collection and analysis. While data from one round was analyzed to construct the next round of items, we often returned to data from prior rounds during analysis. For example, data from responses to a statement about demonstration lessons (using the first strategy discussed above) would be reviewed again, along with data from responses to conditions about demonstration lessons (using the second strategy discussed above), if a single panelist's responses were different from other panelists.

In reflecting upon the successful use of demonstration lessons by teacher leaders, for example, a panelist may have identified three conditions that other panelists did not identify. One or more of these conditions may be included in the set of conditions put in front of the entire panel, testing whether other panelists would agree to the importance of specific conditions, since what might have been understood as a different response could also be understood as a response that was held, but not yet voiced, by other panelists. In some cases, if the panelist was the only one who identified a condition, it was significantly different from those identified by other panelists, and it was not strongly advocated by the panelist, it was not included in the set of conditions put in front of the entire panel. However, all panelists were also asked to add to the set of conditions for a practice, meaning that this panelist could again identify a condition s/he noted in the earlier round. If this happened, we re-evaluated whether such a condition should be treated as divergent data. Ultimately, we did set aside some data (i.e., it was not represented in advice to the field) where there were differences or an idea held only by a single panelist, but this action was not taken without consideration in more than one round of data collection and analysis. More likely, though, was that the disagreement would be reflected in the advice to the field.

Validity threat 3: translating language
In collecting and analyzing practitioners' experience, we were mindful of the imprecision of language used by panelists regarding teacher leadership and teacher content knowledge, particularly when panelists provided individual written responses. Therefore, we used subsequent panel rounds to ask for clarification or elaboration of ideas offered, specifically focusing panelists on terms used which we believed held different meanings to different panel members. We also provided provisional definitions of terms used by panelists for their review and comment. Finally, by consistently asking for comments with the conditions and the advice to the field strategy, we were able to identify, clarify and check among panelists for agreement on terms used.

Generalizability
We do not claim that, based on the two practitioner panels that we used in investigating teacher leadership and teacher content knowledge, we have

practice-based insights that should be generalized to all contexts or populations. Rather, we identified the samples from which the practice-based insights were derived and the limits of generalizabilty that we think are warranted. Moreover, by conducting two practitioner panels for each topic (e.g., teacher leadership), we were able to vary the samples as well as test out how well insights gathered from one sample held with a second sample.

In addition, we built into our methodology some safeguards by which panelists themselves limited the extent to which they generalized from their experiences. One was by asking them to respond to items only when they had direct experience and to provide evidence, in the form of examples, of that experience. This helped us to focus on items where there was sufficient experience among the panelists in the sample to speak to a particular practice and the conditions under which it was successful, rather than building practice-based insights on the back of unsubstantiated opinions of the panelists. A second safeguard was asking panelists themselves to identify the contexts in which an insight might hold, derived from their experience. For example, panelists were asked to consider whether advice to the field might apply in different content areas or different grade levels, and to be explicit about the context of their own experience. In analysis, we also monitored the sources of experiences reported by panelists, and considered whether or how experiences across grade levels, in different content areas, or in different contexts might speak to the extent of generalizability of the practice-based insights gathered.

Conclusion

In the KMD project, we articulated and used a systematic methodology for collecting, analyzing and interpreting knowledge derived from expert practitioners. In order to draw upon practice-based knowledge, we needed to be specific in terms of what we meant by practice-based insights, systematic in terms of how we addressed sampling, data collection and data analysis, and purposeful in addressing validity threats.

We believe that the effort to capture, represent and, therefore, learn from the knowledge of expert practitioners is worth the effort, because what we know about teacher leadership and teacher content knowledge is greatly enhanced when we include knowledge derived from practice. By putting in place a methodology through which insights can be vetted and tested, our confidence in what we learn from practitioner panels is increased. As a methodology that has been applied in two different topics, by different project staff, we have evidence that suggests it can be replicated as an efficient and effective means to identify important practice-based knowledge.

Table 1   Sample for Teacher Leadership Panels

Panel	Prior Experience				Content Area			Grade Level		
	Designer/Instructor	Acted as a Teacher Leader	Supervisor of Teacher Leaders	Researcher/Evaluator	Math	Science	Other	K-5	6-8	9-12
Panel 1 (n=9)	9/9	6/9	3/9	3/9	7/9	4/9	2/9	8/9	8/9	6/9
Panel 2 (n=6)	6/6	4/6	4/6	3/6	5/6	3/6	1/6	6/6	6/6	5/6

Figure 1   Strategy 1: Reflecting on a statement[1]

SECTION THREE
In this section, you are presented with four statements about teacher leader practice, focusing on teacher leaders' efforts in classrooms with teachers. Our plan is to present you with more statements about other kinds of teacher leader practice in round 3. Note that we have grouped what we understand to be related practices together in a single item. You do not have to have experience with every strategy in the item to respond to the item. Feel free to draw on your round 1 responses (copy and paste), including the examples you used in round 1.

We have gathered here the four statements about teacher leader practice so that you can review them as a set before responding to items 10-13. These are a subset of practices that a teacher leader may engage in; you will see more statements about teacher leader practices in round 3.

- o A teacher leader provides support to a teacher in the classroom by modeling a strategy, doing a demonstration lesson or piloting a new assessment. The teacher leader, through his/her own teaching in a colleague's classroom, provides support to that teacher.
- o A teacher leader provides support to a teacher leader in the classroom by observing the teacher and offering feedback on what was observed. The teacher leader, through his/her capacity to watch and listen critically to a colleague teaching in his/her classroom and frame a discussion about teaching practice provides support to that teacher.
- o A teacher leader provides support to a teacher in the classroom by planning lessons, reviewing lesson plans, or analyzing lessons in terms of state or district standards with a teacher. The teacher leader, through his/her skills at lesson planning and analysis, provides support to that teacher.
- o A teacher leader provides support to a teacher in the classroom by working alongside the teacher by co-teaching (i.e., teaching part of a lesson), working with a group of students in the class, or functioning as part of a teaching team. The teacher leader, through his/her capacity to move in and out of the instructional "flow" of a lesson.

DIRECTIONS: As in round 1, please consider all of your experiences with teacher leaders and teacher leadership (as program designer, supervisor, evaluator, etc.) in responding to each of the statements below. Then,

- o (optional) revise the statement to better reflect your experiences;
- o indicate the extent to which you've experienced this teacher leader practice;
- o give your hunch about why this practice works;
- o if you have seen kind of teacher leader practice implemented successfully, provide an example; and
- o if you have seen this kind of teacher leader practice implemented unsuccessfully, provide an example.

Figure 1 cont.

---

[1] KMD teacher leadership panel 1, round 2, section three introduction and item 10a-e.

10a. A teacher leader provides support to a teacher leader in the classroom by modeling a strategy, doing a demonstration lesson or piloting a new assessment. The teacher leader, through his/her own teaching in a colleague's classroom, provides support to that teacher.

Optional statement revision:

```
```

10b. In your experience of teacher leadership, indicate the extent to which this practice was evident (note that you do not have to have experience with every strategy in the item).

◯ None of the situations in which I've experienced teacher leadership

◯ In a few of the situations in which I've experienced teacher leadership

◯ In most of the situations in which I've experienced teacher leadership

◯ In all of the situations in which I've experienced teacher leadership

10c. Thinking across all the situations/settings you've seen where this practice was evident, share any hunches you have about why this practice worked.

```
```

10d. Describe one example of a situation/setting where you've seen this practice implemented *successfully*, including the specific conditions that you believed were factors in successfully implementing this practice and any indicators to you that this practice was successfully implemented (i.e., any indicators that this practice worked in this setting).

```
```

10e. Describe one example of a situation/setting where you've seen this practice attempted and implemented *unsuccessfully*, including the specific conditions that you believed were factors in unsuccessfully implementing this practice and any indicators to you that this practice was unsuccessfully implemented (i.e., any indicators that this practice didn't work in this setting).

```
```

Figure 2   Strategy 2: Reflecting on conditions[2]

SECTION THREE
In round 2, we asked you to respond to four statements about *teacher leader practice*, focusing on teacher leaders' efforts in classrooms with teachers. (In the last section of this round, we ask you to respond to another four statements, about teacher leader practice beyond teacher leaders' efforts in classrooms with teachers.) We are working from the assumption that teacher leader practices are quite varied, but that there is some agreement for any single practice about the conditions necessary for that practice to be successful.

Based on analysis of responses from all panelists about teacher leader practices in classrooms with teachers, including your articulation of the conditions under which a particular practice was implemented successfully and unsuccessfully, we have selected a set of statements for round 3 that offered the greatest agreement or raised important differences among panelists. For each statement, we have summarized the conditions that were most often noted. We are asking you to react to each of these conditions for a small number of statements.

DIRECTIONS: Read each of the statements and then the summary of the conditions the panel noted as potentially important. Then, rate the importance of each of the listed conditions. Comment, if you choose, on the condition to elaborate or clarify.

In the second round, we asked you to consider the following statement:

A teacher leader provides support to a teacher in the classroom by modeling a strategy, doing a demonstration lesson or piloting a new assessment. The teacher leader, through his/her own teaching in a colleague's classroom, provides support to that teacher.

It was not clear that any panelists addressed piloting a new assessment, leading us to reword the statement as follows for this round:

A teacher leader provides support to a teacher leader in the classroom by modeling a strategy or doing a demonstration lesson. The teacher leader, through his/her own teaching in a colleague's classroom, provides support to that teacher.

In order for this teacher leader practice to be successful, panelists noted that the teacher leader should have sufficient preparation and knowledge to expertly teach the demonstration lesson or model a strategy. This is an opportunity to share good/effective practice, and the teacher leader needs to be competent in this regard. The demonstration lesson or modeling experience needs to occur in a "real" setting, with students that the teacher identifies with (such as the students that the teacher teaches). This adds to the teacher's engagement and can provide an "existence proof" that s/he could similarly teach the lesson or use the strategy. The demonstration lesson or modeling experience done by the teacher leader needs to be meaningful to the teacher, i.e., directly related to the teacher's practice or addressing questions that the teacher has. Teacher leaders need to work with teachers beforehand to frame a specific question or issue to guide the teacher's observation of a demonstration lesson or modeling experience, so that there is a clear

---

[2] KMD teacher leadership panel 1, round 3, section three introduction and item 7a-b (not including 7c-j).

Figure 2 cont.

focus. A few panelists noted that there needs to be shared expectations between the teacher leader and teacher about what constitutes good instruction. Many panelists noted that time was an important consideration. Time is needed before the demonstration lesson or modeling experience for the teacher leader and the teacher to review the lesson or strategy to be taught by the teacher leader. Time is needed after the demonstration lesson or modeling experience for the teacher leader and the teacher to debrief and discuss what the teacher is taking away from his/her observation. Finally, some panelists noted that demonstration lessons or modelling experiences should be used by teacher leaders early in their work with teachers, and then used less frequently as teacher leaders continue to work with teachers.

7a. Do you have experience with this teacher leader practice? (If no, skip to item 8)

☐ Yes

☐ No

How would you rate the importance of each of the following conditions for a teacher leader providing support to a teacher through a demonstration lesson or modeling of a strategy? Feel free to rewrite the condition. Please comment on your rating as appropriate.

7b. The teacher leader should have sufficient preparation and knowledge to expertly teach the demonstration lesson or model a strategy.

☐ Essential to achieve the purpose

☐ Helpful but not essential

☐ Not helpful

Comments:

Figure 3   Strategy 3: Reflecting on advice to the field[3]

SECTION ONE
A major goal of the previous rounds was to identify the conditions that panelists believe are necessary for successful teacher leader work. In this section of Round 4, we present those conditions in the form of advice to the field.

Looking across responses, we crafted the following paragraphs to try to represent the panel's views on two different teacher leader practices, and the necessary conditions for each. Please read and react to each set of paragraphs as a general recommendation to share with the field, and then respond to the specific statements that follow in which we are testing out the extent of agreement on additional advice to the field.

Advice to the Field: Teacher leader providing support to a teacher through a demonstration lesson or modeling of a strategy

Teacher leaders often engage in the practice of providing support to a teacher through a demonstration lesson or modeling of a strategy. [Note to panelists: This advice is framed in terms of a teacher leader and a single teacher. See item 1d below with regards to applicability of this advice for a teacher leader working with a group of teachers with this practice.] Sufficient preparation and knowledge to expertly teach the demonstration lesson is an essential condition for this practice. This doesn't necessarily mean that the lesson must proceed flawlessly, but that the teacher leader is sufficiently knowledgeable to adapt the lesson as needed and reflect with the teacher on any changes that may have been made. The teacher leaders' knowledge needs to be both about the mathematics or science content of the lesson as well as the pedagogy.

The demonstration lesson or modeling experience needs to occur in a classroom setting that is realistic and similar to the teacher's classroom. In some cases, the classroom setting may be the teacher's own classroom, with the teacher's students. In some cases, the classroom setting may be that of another teacher in the building, or a classroom that is seen on video. With any of these settings, the key is that the students be similar (or as similar as possible) in ability and disposition to those of the teacher observing the demonstration lesson or modeling experience. In this way, the demonstration or modeling offers an existence proof that such work is possible "with my kids".

It is essential that the demonstration lesson or modeling experience be "purposeful and relevant" to the teacher, in some way connected to the teacher's practice. This may be around something that the teacher is currently trying to do in his/her own classroom, something that the teacher anticipates doing, or something that the teacher is reluctant to do because of the challenge it poses. A demonstration lesson or modeling experience needs to have some meaning for the teacher; it must not be so far beyond his/her own practice or questions that it seems irrelevant.

Another essential condition is that a teacher's observation of a demonstration lesson or modeling experience, by a teacher leader, needs to be framed by a specific question or issue. This provides some focus to the observation by the teacher, and to the discussion after the observation between the teacher and teacher leader. Without a guiding question or issue, there will likely be too many

---

[3] KMD teacher leadership panel 1, round 4, section one introduction and item 1a-b (not including 1c-d).

Figure 3 cont.

things for a teacher to consider. While it is possible that other issues or questions may arise during the observation which provide fertile grounds for discussion, it is essential that there be some agreement prior to a demonstration lesson or modeling experience about a framing question or issue that can, minimally, shape the discussion. Consideration of an appropriate framing question may be part of a review of the lesson or strategy to be taught by the teacher leader, so that the teacher can be well-prepared for the observation.

At some point after the demonstration lesson or modeling experience, it is essential that there is time for the teacher and teacher leader to debrief and discuss what the teacher understood from his/her observation. This is the "making meaning" part of the experience, which is important in answering the framing question that the teacher brought to the observation. It is also the time when the teacher leader helps the teacher connect what was observed to his/her own classroom practice, in this way "making meaning" relevant to the teacher's own instruction. Thus, discussion time after the demonstration lesson or modeling experience is an opportunity both to discuss and analyze what was observed as well as to strategize about implications for application by the teacher.

1a. Do you agree with the above advice to the field?

☐ Yes

☐ No

If you have any particular concerns about any part of these recommendations, please describe them here.

Panelists had somewhat different ideas about other conditions for teacher leader efforts around a demonstration lesson or modeling experience. Please comment on the following paragraphs, as additional advice to the field.

Shared expectations between a teacher leader and a teacher about what constitutes good instruction is essential, but these shared expectations may precede a demonstration lesson (and be enacted in the lesson) or be articulated through reflection on a demonstration lesson. Moreover, the shared expectations about good instruction should not just be what is determined by a single teacher leader and a single teacher, but reflect a shared vision from the larger mathematics or science community about quality instruction.

1b. Please choose one of the following, and comment as appropriate:

☐ I agree with this paragraph as a general recommendation to be added to the previous paragraphs.

Figure 3 cont.

◻ I agree with parts of this paragraph as a recommendation to be added to the previous paragraphs. (Specify which parts you agree/disagree with, and why. If possible, offer an example to explain your thinking.)

◻ I disagree with this paragraph statement as a recommendation to be added to the previous paragraphs.

Comments:

```
```

Demonstration lessons or modeling experiences should be used purposefully, and teacher leaders should give consideration to when they are used with teachers. When a particular lesson or strategy is new to a teacher, demonstration or modeling is a useful way to develop the teacher's capacity to bring the lesson or strategy to his/her classroom. Often, this means that there is more need for demonstration lessons or modeling strategies when practices are new to a teacher, and less need for them as the teacher becomes more familiar with a particular strategy, pedagogy, or content. An essential condition is that teacher leaders are purposeful about when, and to what end, a demonstration lesson or modeling experience is used with a teacher.

1c. Please choose one of the following, and comment as appropriate:

◻ I agree with this paragraph as a general recommendation to be added to the previous paragraphs.

◻ I agree with parts of this paragraph as a recommendation to be added to the previous paragraphs. (Specify which parts you agree/disagree with, and why. If possible, offer an example to explain your thinking.)

◻ I disagree with this paragraph statement as a recommendation to be added to the previous paragraphs.

Comments:

```
```

Table 2   Display of items from teacher leadership panels: use of strategy 1, 2 and 3 [4]

Statements (strategy 1)	Conditions (strategy 2)	Advice to the field (strategy 3)
Teacher leader selection criteria	I	I and II
Teacher leader preparation: gaps/holes	I	I and II
Teacher leader preparation: culture of ongoing learning	I	I
Teacher leader preparation: skills for new roles	I	II
Teacher leader preparation: enhance prior experience	I	
Teacher leader preparation: teachers' learning agenda	I	
Teacher leader practice: support classroom practice	I	I and II
-demo lesson/modeling	I	I and II
-lesson planning	I	I and II
-observing/feedback	I	
-access to resources	I	
-co-teaching	I	
-combination of strategies		II*
Teacher leader practice: support implementation of materials	I	I and II
Teacher leader practice: design/facilitate professional development	I	I and II
Teacher leader practice: leadership to committees, etc.	I	I and II
Teacher leader practice: deepen teachers' content knowledge	I	
Teacher leader practice: influence policies	I	
Teacher leader selection/preparation/practice: relationship among all three		II*
Teacher leader selection/ preparation/practice: influence of no, part-time, full-time release		II*
Reflections on teacher leader perspectives and themes	I	

*While not presented to panelists strictly in the advice to the field format, panelists did have multiple opportunities within a single round to reflect on these ideas.

---

[4] The statements are grouped thematically (e.g., all statements about teacher leader practices are grouped together). I refers to the first teacher leadership panel; II to the second teacher leadership panel. See Appendices A and B for the full statements.

**Figure 4   Relationship between the selection, preparation, and practice
of teacher leaders**

Teacher Leader
Selection

Teacher Leader
Practice

Teacher Leader
Preparation
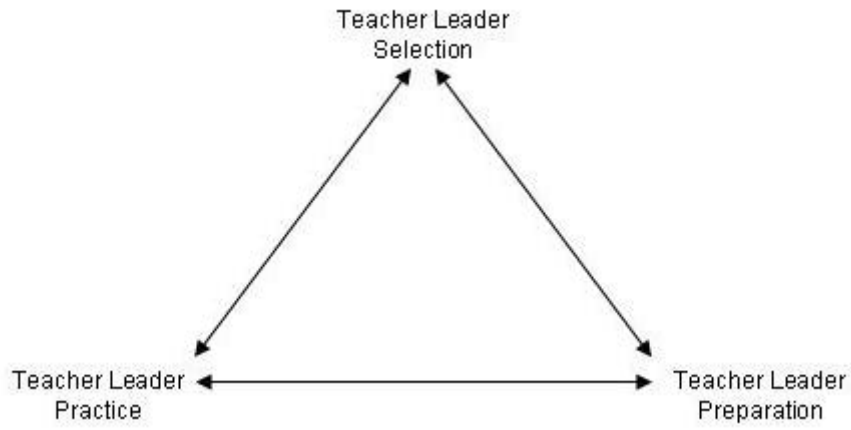
Reference

Barth, R. (2006). Improving relationships within the schoolhouse. *Education Leadership 63*(3), 8-13.

Denzin, N., & Lincoln, Y. (Eds.). (1998). *Strategies of qualitative inquiry*. Thousand Oaks, CA: Sage Publications.

Elmore, R. (2002). *Bridging the gap between standards and achievement: The imperative for professional development in education*. Washington, DC: Albert Shanker Institute.

Hauck, Y., (2007) Research priorities for parenting and child health: A Delphi study. *Journal Of Advanced Nursing, 59*(2), 129-39.

Hawkins, D. (1966). Learning the unteachable. In L.S. Schulman & E.R. Keislar (Eds.), *Learning by discovery: A critical appraisal* (5-8). Chicago: Rand McNally.

Heck, D. (2008). *Applying standards of evidence to empirical research findings: Examples from research on deepening teachers' content knowledge and teacher leaders' intellectual leadership in mathematics and science.* Paper presented at the annual meeting of the American Educational Research Association, New York, NY.

Kingsley, G. & M. Waschak (2005). *Finding value and meaning in the concept of partnerships.* Paper presented at the Evaluation Summit: Evidence-based findings from MSPs, Minneapolis, MN.

Maxwell, J. (2004). Casual explanation, qualitative research, and scientific inquiry in education. *Educational researcher, 33*(2), 3-11.

Maxwell, J., & Miller, B. (2008). Categorizing and connecting strategies in qualitative data analysis. In S. Hesse-Biber & P. Leavy (Eds.), *Handbook of emergent methods* (461-477). New York: Guilford Press.

Miles, M., & Huberman, A. (1994). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Miller, B., Schiavo, N., & Busey, A. (2008). *Teacher Leaders Providing Classroom Support to Teachers through Demonstration Lessons/Modeling*. Retrieved January 25, 2008, from *Math and Science Partnership Knowledge Management and Dissemination* Web site: http://www.mspkmd.net//index.php?page=03_1a.

Shulman, L. (2004). *The wisdom of practice: Essays on teaching, learning, and*

learning to teach. San Francisco: Jossey-Bass.

Shulman, L. (1987). Knowledge and teaching: Foundations of the new reform. *Harvard Educational Review, 57*(1), 1-22.

Wen, J.R., & Shih, W.L. (2008). Exploring the information literacy competence standards for elementary and high school teachers. *Computers & Education, 50*(3), 787-806.

Wolcott, H.F. (1982). Differing styles of on-site research, or, 'if it isn't ethnography, what is it?'. *The Review Journal of Philosophy and Social Science, 7*(1&2), 154-169.