Building Communities of Knowledge
Ideas for More Effective Use of Knowledge in Education Reform

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Introduction

The notion that data and research should be used to improve education policy and practice is now almost a cliché. But until the 1970s, policymakers in the education realm rarely thought of themselves as consumers of research. Around this point, the United States began experimenting with a number of dissemination and knowledge utilization projects that were designed to help schools improve and innovate, and developed an elaborate infrastructure, modeled after that created for agriculture, to disseminate research with the assumption that it would lead to effective knowledge utilization and, ultimately, improved policy and practice. This assumption has proven incorrect, as the “technocratic” model of knowledge use has led to fragmented policy and inconsistent application among practitioners (Seashore Louis, 2003).

Over the last few decades there have been significant attempts to improve the use of knowledge in creating education policy and improving education practice, but these attempts have focused on disseminating findings from research rather than using knowledge and have resulted in a series of uncoordinated activities (Seashore Louis, 2003). More recently, the standards and accountability movement has both directly and indirectly pushed the concept of knowledge utilization back into the awareness of educators, administrators, policymakers, external technical assistance providers, and researchers. The term “knowledge utilization” generally refers to the systematic application of professional wisdom and findings of high-quality research to improve educational outcomes for students. Knowledge utilization activities are typically dynamic and structured interactions among key stakeholders, including researchers, developers, disseminators, technical assistance providers, practitioners, and policymakers.

The standards and accountability movement’s direct impact on the emergence of knowledge utilization is a result of the federal government requiring, most notably through the No Child Left Behind Act, schools to use “scientifically based” programs and practices in areas such as reading instruction and professional development for teachers. In recent years, the federal government has also attempted to encourage practitioners to apply research by trying to upgrade the quality of educational research through the prioritization of funding for randomized trials and by creating the “What Works Clearinghouse,” established in 2002 by the U.S. Department of Education’s Institute of Education Sciences, which seeks to “provide educators, policymakers, researchers, and the public with a central and trusted source of scientific evidence of what works in education” (www.whatworks.ed.gov/whoweare/overview.html).
The standards and accountability movement has also had an indirect impact on educators’, administrators’, and policymakers’ use of knowledge to improve policy, programs, and practice. By requiring schools and districts to test all students and demonstrate adequate yearly progress in the percentage of subgroups of students who are proficient in reading, math, and science (soon), NCLB and state accountability systems have made available to districts and schools large amounts of student performance data. Districts and schools are increasingly using these data to, among other things, identify and tutor low-performing students, streamline curriculum, and improve the quality of professional development activities (Center on Education Policy, 2005).

The literature on effective schools and organizations suggest that the increasing emphasis on using data and research to improve policy, programs, and practice will have a positive impact on student outcomes (Supovitz and Klein, 2003). The literature and experience also suggest, however, that the field of education has a long way to go before data and research are used systematically and effectively to develop policies, programs, and practices that have a significant, wide-scale, and long-lasting impact on students (Hood, 2003).

What is a model of using knowledge—generated through research, data, and experience—that complements the standards and accountability movement and is most likely to have a significant, wide-scale, and long-lasting impact on student outcomes? This paper explores this question, starting with a simplified description of the model most frequently used today, proposing a more effective model based on the notion of communities of practice, and concluding with a discussion of some of the barriers to using such a model.

**Current Practice**

Knowledge utilization is often viewed as essentially a linear process, in which research generates information; educators implement policies, programs, and practices that are based on that information; and student achievement improves (see Figure A). However, it is the one-way nature of this model that keeps research from benefiting student learning to the extent that it should. What is missing is a give and take between researchers on the one hand and educators and policymakers on the other hand that would allow research to be better tailored to meet educators’ and, ultimately, students’ needs.

As it is now, private and government sponsors typically support research or evaluations that are proposed by scholars, perhaps in response to requests for proposals targeted at particular research areas. These projects may or may not address actual problems that have been articulated by teachers and school administrators. Researchers do frequently reach out to practitioners to gain access to data and information, to conduct interviews with and observations of practitioners, and to collect data in other ways. However, it is rare that teachers, administrators, or even policymakers have the opportunity to shape studies so that they can provide specific help to them in improving school quality or educational practice.
Practitioners can and do have access to research findings and can adapt them in improving policies, programs, and practices, but this happens only sporadically. Few systems are in place to encourage practitioners to engage with research, and those that exist are often fractured and poorly developed. Most practitioners get exposed to some research in their training to become teachers or principals. In addition, some teachers and administrators read about applicable research in the popular press or a trade journal such as Education Week. Others learn about research that can be adapted to the classroom or school setting through continuing education and recertification programs and professional development activities. Finally, some teachers and school administrators learn about research that could inform their practice through informal networks of colleagues. Many practitioners, however, infrequently use research to improve their programs or practices. Indeed, there is little incentive for them to do so except when it is explicitly required by state and federal accountability systems (Helmsley-Brown and Sharp, 2003).

A more frequent way for research to influence practice is through programs developed by external service providers, such as a software developer or textbook publishers, or district and state administrators. Vendors or school system staff often use available research to create products or programs intended for use by teachers and principals. They may draw on available research in developing curricula, professional development activities, or plans for turning around schools identified as needing improvement. These products and programs might benefit schools and their students, but the intermediary—whether commercial vendor or district or state staff—places a barrier between the knowledge producer and the knowledge user. Thus practitioners are passive and indirect recipients of knowledge, and they are therefore less likely to internalize the knowledge and make effective use of the research-based programs and practices (Cross City Campaign for Urban School Reform, 2005). As a result, students are less likely to benefit significantly or for any sustained period of time.
A close look at the way the linear model for using knowledge to improve student performance operates reveals that it fails to allow for the critical role of two important and related factors. First, the linear model focuses exclusively on what is called explicit knowledge—formalized, systematic, and usually quantifiable—and completely ignores the critical role played by tacit knowledge (Nonaka, 1998):

Tacit knowledge consists partly of technical skills—the kind of informal, hard-to-pin-down skills captured in the term ‘know-how.’ . . At the same time, tacit knowledge has an important cognitive dimension. It consists of mental models, beliefs, and perspectives so ingrained that we take them for granted, and therefore cannot easily articulate them. For this very reason, these implicit models profoundly shape how we perceive the world around us (page 28).

Second, the linear model fails to acknowledge the important role played by the intellectual communities in which practitioners do their work in improving outcomes for students. Peter Senge (1990) addressed this point in his book The Fifth Discipline. He described the importance of “learning communities,” places “where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together” (cited in Garvin, 1998, page 49).
Senge was not the first to stress that practitioners cannot accomplish all that is asked of them on their own. Ideally, it is the school that constitutes the primary learning community and provides practitioners with the stimulation and support they need to constantly improve their practice. To foster success, schools themselves need to constantly improve, finding new ways to have a continuous and significant impact on student achievement. But before schools can improve their capacity to help students learn, they first must become “learning organizations”—skilled at creating, acquiring, and transferring knowledge, and at modifying [their] behavior to reflect new knowledge and insights” (Garvin, 1998, page 51).

For research to have a significant and long lasting impact on student achievement, then, an alternative to the linear model is needed. If the plan for knowledge utilization encompasses both the site level (schools and district administration) as well as the policy level (district school boards and the state and federal governments), the result should be both richer research and more direct impact on student learning. The model depicted in Figure B represents a system by which research and practice are integrated and each influences the other and delineates roles and means of interactions for each participant in the system. The model begins with the notion that practitioners at the site level must be actively and continuously engaged in the development and application of research. Specifically, practitioners can contribute by:

- working collaboratively in networks to identify the barriers to higher student achievement;
- collecting and analyzing data and external research that helps them effectively define the barriers and generate strategies for overcoming them;
- generating the knowledge for doing so; implementing the strategies and evaluating their effectiveness; and, when appropriate,
- bringing to scale the strategies shown to improve student outcomes.

Throughout the process, practitioners should be engaged in evaluating both the impact of their policies, programs, and practices as well as the process for creating and implementing them (Brown, 1998).

At the same time, districts and state and federal governments—charged with supporting schools and holding them accountable—would go through a similar process. Under this model, schools and the policymaking organizations would also be contributing to the research base by disseminating the results of the evaluations of their own efforts.
Figure B: A Dynamic Model of Knowledge Utilization: Educators, Administrators, and Policymakers Working Collaboratively to Identify Problems and Develop and Implement Solutions
Strengths of the Model

This dynamic model for developing and applying knowledge has at least three advantages over the linear model of knowledge utilization. First, it empowers teachers and principals, as well as policymakers and administrators, to identify and solve problems in a way that draws on external research but also requires them to engage actively in generating an understanding of the problems as well as considering alternative solutions.

Second, the model provides for the importance of tacit knowledge. High-quality research is critical for helping practitioners and policymakers understand the problems they have identified and generate solutions to those problems. However, there is no way that research can address all the problems faced by educators and policymakers. Even if it could, there are insufficient incentives or opportunities for teachers and administrators to keep up to date on new research and consistently apply it to increasing student achievement (Helmsley-Brown and Sharp, 2003).

Application of the dynamic model will create demand for research that is both practical and of high quality as teachers, administrators, and policymakers look to the literature for guidance in understanding and ultimately solving problems they have identified. Application of the model also will create incentives for researchers to work more closely with schools to ensure the relevance of their work.

Having access to and using external research, however, is a necessary but not sufficient condition for practitioners and policymakers to improve the quality of schools. Although it provides knowledge about the experiences and outcomes of others and a theoretical base for the hard work of school reform, research rarely can address the tacit knowledge that is critical for successful school reform. Yet effective application of the “explicit knowledge” derived from external research requires tacit knowledge. This process is not automatic—“sharing tacit knowledge requires interaction and informal learning processes such as storytelling, conversation, coaching, and apprenticeship of the kind that communities of practice provide (Wenger, McDermott, and Snyder, 2002).

Finally, the model takes into account the dynamic nature of school systems and of knowledge itself. The circles of the figure eight in Figure B represent the idea that problems are never completely solved: once an apparently effective policy, program, or practice has been implemented to address an identified problem, additional “problems”—such as imperfect implementation, unintended consequences, and sustainability—should be expected. A new process to identify and address the new problems should be an element of the plan.

The fact that the circles in Figure B are inter-connected represents the idea that the site and policy levels are dependent on and supportive of one another. As solutions to problems are implemented, teachers, administrators, and policymakers will find ways in which the new policy, program, or practice can be improved or integrated more effectively with existing ones. And, as a school learns from its successes and ongoing
challenges, it should be passing on information to its district and state, which in turn can learn from the school’s experience and build their capacity to support other schools.

Elements of the Model

The dynamic model of knowledge utilization in education is based on the premise that, to have a significant and sustainable impact on student achievement, schools and the district, state, and federal agencies that support them must create and nurture high-quality “communities of knowledge.” The concept of communities of knowledge is rooted firmly in the idea of communities of practice, which—according to Wenger, McDermott, and Snyder (2002)—“are groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis” (page 4).

The main distinction between communities of knowledge, as used in this model, and communities of practice is the responsibility for contributing to the “explicit” knowledge base. Whereas communities of practice draw from the research literature to understand and solve the problems they identify, they typically are not expected to contribute to the research literature. Communities of knowledge, on the other hand, both learn from external research and, when appropriate, contribute to the research literature in an effort to help inform other communities of knowledge wrestling with similar problems.

Communities of knowledge in schools can and do develop organically. That is, groups of teachers and administrators frequently come together—in the teachers’ lounge, after school, or during free periods—to discuss topics of interest and importance, such as improving instruction for low-performing students. To have significant and long-lasting impact on student achievement, however, school leadership must encourage and facilitate the development and ongoing work of such communities. Ideally, depending on the size of the school, two to five communities of knowledge consisting of five to ten members should be created, each with a different focus. For example, one community might decide to focus on math achievement in the school, another on safety, and a third on teacher morale.

The leadership in the school, including the principal, should provide support to the communities—by giving teachers time during the school day to meet, data and research related to their topic, suggestions, and perhaps a small budget—but should not try to control the topic or process, which is described below.

Identify Problem

Once a topic has been selected for the community of knowledge to focus on, the group needs to specify the problem. Problem identification should be focused on narrowing the

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1 Throughout the discussion of the elements of the model, examples are given at the site level. Similar examples at the policy level could also be given.
topic that has been selected in a way that can be described, understood, and ultimately addressed. For example, rather than defining a problem as low student achievement, the team should try to isolate the causes of that problem. Is the problem in all subjects or are most students having particular problems in math? Are all students having the problem or only students whose first language is not English? Even if the problem is widespread, the team should focus on a narrow piece of the overarching problem, and the school should not attempt to address more than a few problems, or parts of the problem, at any one time.

Collect Data/Research

Once a problem has been identified, the community of knowledge must take on the task of collecting data and external research that will help develop understanding about the nature of the problem and generate possible solutions. Communities might review existing data, such as test scores and lists of students who have had disciplinary problems, but they might also identify data that need to be collected. For example, a team focused on the school’s high absentee rate among special education students might decide that it needs to interview or survey the students and their families. A team focused on low scores on the fourth grade assessment might choose to analyze the alignment between the fourth-grade curriculum and the assessment and between third and fourth-grade curricula.

External research will likely help to shed some light on the problem that has been identified, and it should be collected at this stage. For example, what does the literature say about improving math achievement among elementary school students? Are there any schools or districts in the area that have increased math scores? If so, how did they do it? Are there any math programs that have been shown using randomized trials to have a positive impact on student achievement?

Cull Information

A community of knowledge needs to cull the information from the collected data and research that is applicable to the specific problem it has identified. During this stage, members of the community will also discuss their own understanding of the problem—tacit knowledge—with other members.

At this stage, the community might also find that it needs to revise its problem definition slightly based on the data and research collected. For example, a community of knowledge that has identified a problem of low math achievement among African American students might discover after analyzing the data that the real problem is that all fourth graders are having trouble answering problems about measurement and probability.

Generate Knowledge

Although an essential step, culling information from collected data and research will not enable the community of knowledge to begin formulating solutions to its identified
problem. Another step is required as information “only becomes valuable in a social context” (Fullan, 2001). Petrides and Guiney (2002) note the important transition of information to knowledge: “It is within the process of accumulating, synthesizing, and sense making of information that knowledge, the intangible commodity of all educational institutions, is created.”

The relationship between information and knowledge is similar to that between potential and kinetic energy. “Essentially,” write Petrides and Nodine (2003), “knowledge is the application of information to decisionmaking or action.” In order for information to become knowledge, then, community members need to discuss the problem and information, identify gaps in their understanding, communicate what they’ve learned to people outside their community, and, ultimately propose hypotheses about how the identified problem could be solved. In this way, members not only arrive at a better understanding of the problem, they begin to take ownership for solving the problem. This willingness to own the problem and its solution stands in stark contrast to the predictable failure of teachers to take individual or collective responsibility under a linear model because the problem and a “research-based” solution have been identified for them.

In general, the process of identifying a problem, collecting data and research, culling information, and generating knowledge serves at least two important purposes (Wenger, McDermott, and Snyder, 2002). First, it helps the school improve by identifying barriers to student success and proposing solutions that have wide-scale buy-in. Second, the process helps practitioners improve by facilitating a process that helps them become reflective about their practice, strategic in their actions, and accountable for their results.

**Develop Policies, Programs, and Practices**

Once members of the community of knowledge have generated hypotheses for how to solve the identified problem, they will develop or select a policy, program, or practice that they believe will address the problem most effectively. For example, a community of knowledge in a middle school might hypothesize that explicitly teaching reading comprehension strategies during math class will help improve students’ ability to solve word problems. The group would then develop instructional strategies or identify those used in another school for math teachers to teach reading comprehension in a way that helps their students solve word problems more effectively.

The community of knowledge, with support from the school leadership, would then ask a sample of teachers to implement the instructional strategies, allowing other teachers and administrators to observe and evaluate. Based on the observations and feedback from participating teachers and school leadership, the new instructional strategies will likely be revised somewhat and tried again in the sample of classrooms.

Effectively using knowledge to inform policy or a practice such as teaching reading comprehension during math class necessarily requires adaptation of research or professional wisdom to address contextual factors at the site level (Hargreaves, 1998). Indeed, a key concept that emerges from the research on the implementation of education
reforms is that practitioners change reforms as much as the reforms are trying to change the practitioners (Cuban, 1998) and that adaptation occurs even when knowledge-based practices or policies are highly specified (Datnow and Stringfield, 2000). Adaptation is necessary for any intervention or reform to be successful (McLaughlin, 1987), however, the act of adapting can undermine the very effectiveness of a practice, program, or policy. Therefore, practitioners and policymakers must take great care and, ideally, receive technical support and evaluate their progress when adapting research, policy, program, or practice for implementation in their own setting.

Implement and Sustain the Policy, Program, or Practice

Once the policy, program, or practice has been revised and retested, the community of knowledge, with support from the school leadership, will implement it across the entire school. At this point, members of the community of knowledge, perhaps with support from external technical assistance providers, will serve as trainers for all those who must take responsibility for implementation.

Evaluate and Research

In addition to serving as trainers and technical assistance providers, members of the community will also take the lead in evaluating the implementation and impact of the new policy, program, or practice. Not only should evaluation examine the question of whether the problem identified in the school is being addressed effectively, it should also allow members to provide feedback to educators implementing the new policy, program, or practice, and to make adjustments as necessary.

Second, members should determine whether their experiences would be of interest to other educators. It is at this point that the community of knowledge distinguishes itself from a community of practice. A community of knowledge may decide that it can contribute to the literature base on a given topic, thereby helping educators in schools across the country address similar problems more effectively. If so, members of the community of knowledge may choose to work with external researchers to help with the evaluation, documentation, and dissemination processes.

Interactions Between the Site and the System

The examples discussed so far have focused on the school level. Districts, states, the federal government, and funders (foundations and corporations), however, are also expected to develop and nurture their own communities of knowledge that would engage in the same process as educators at the school level, although working on different types of problems and implementing different types of policies, programs, and practices to address those problems.

In addition to identifying and addressing problems of importance to students and their schools, districts, states, the federal government, and funders have responsibility as well for identifying and disseminating effective practices and programs. Their roles include funding high-quality research and duplication research, creating incentives for teachers to
learn about and apply existing research, creating incentives for researchers to work closely with schools and districts, and leading by example by using data and information systematically to generate knowledge and make decisions based on that knowledge.

Most important, the policy level should help to foster the conditions that enable the site level to create and nurture communities of knowledge. For example, districts should help schools create schedules that allow teachers to collaborate, hire and train coaches who provide research based professional development, use information generated by one school to provide assistance to other schools, and help schools to evaluate the effectiveness of major programs and practices.

Role of External Intermediaries

External intermediaries play a critical role in the dynamic model of knowledge utilization, as they are necessary to both the input and output of the system. First, professional researchers can provide input to both the site and policy levels by providing data and information about the strategies of schools, districts, and states from across the country and the effectiveness of the strategies. In addition, technical assistance providers could provide input by helping to facilitate the community of knowledge process. Such assistance might include working with the organization (school, district or state or federal government) to create the communities of practice, develop their processes, offer advice about managing them, and help to gather and analyze information and data.

Another important potential role for the technical assistance provider is to support the implementation of policies, programs, and practices developed or identified by a community of knowledge. Perhaps the most consistent and ubiquitous finding in the literature on knowledge use and application is the importance of practitioners having frequent and direct contact with a respected and knowledgeable support person (National Center for the Dissemination of Disability Research, 1996). To use knowledge to improve educational practice and student outcomes, then, schools and districts might decide to hire instructional coaches or an individual responsible for facilitating the school or district change process.

External intermediaries in general, and researchers in particular, can also help the site and policy levels with the “output” functions of communities of knowledge. As was discussed above, one of the main distinctions between a community of knowledge and community of practice is the responsibility held by the community of knowledge to not only evaluate the implementation and impact of their policies, programs, and practices as communities of practice must do, but to do so in a way that potentially builds the capacity of other communities across the world. To do so, communities of knowledge must publish and disseminate significant findings and lessons learned, tasks to which most schools, districts, and state and federal agencies are not accustomed.

To help communities of knowledge fulfill this important responsibility, researchers must change the way they do business. Specifically, researchers need to stop the practice of tearing down research for its own sake and focus instead on helping practitioners and policymakers evaluate the effectiveness of their policies, programs, and practices;
determine whether existing research findings are replicable; and work closely with practitioners and policymakers to ensure that research conducted is practical and important.

Conclusion

Communities of knowledge and the dynamic model of knowledge utilization are not new ideas. Schools and districts across the county effectively apply the principles outlined in this paper everyday. And some school reform models, including the Accelerated Schools model (which has been used in over 1,500 schools), are based on these principles. Moreover, many of the active elements of a dynamic model exist but they are not systematically connected in terms of infrastructure.

That is not to say, however, that implementing the dynamic model of knowledge utilization on a wide scale will be easy. Indeed, there are several barriers that must be overcome including, but not limited to, the following:

- Many school schedules are not structured to give practitioners time during the day to participate in communities of knowledge.

- Sites often have limited control over their own resources, preventing them from implementing solutions to identified problems, and teacher contracts often limit the hours that teachers can be available to participate in community of knowledge activities.

- Many stakeholders expect immediate results, and communities of knowledge are structured to be deliberate.

- There are a limited number of policies, programs, and practices determined effective by high-quality research.

- Practitioners and policymakers may lack the capacity to use data and research to make decisions and to evaluate the policies, programs, and practices they put in place.

- Many educators do not trust or believe in the validity of their data, sometimes with good reason.

- Schools, districts, and state and federal government agencies lack the leadership necessary to develop and sustain communities of knowledge.

- Data systems are frequently incomplete and not integrated.

These barriers, although significant, can and must be overcome if schools, districts, states, the federal government, and funders are to generate and apply knowledge in a way that will have a significant and long-term impact on student achievement. Programs that
train our future teachers and administrators must do a much better job of teaching practitioners to collect, analyze, and apply data, information, and research. Districts and state and federal governments must help schools by serving as community-of-knowledge models and giving practitioners training and resources to implement the dynamic model of knowledge utilization effectively. Funders should provide incentives to encourage schools, policymakers, researchers, and technical assistance providers to act in a way that is consistent with the model. Leaders at all levels in the education system must help to create and nurture communities and practice. Indeed, the main job of managers in the knowledge-creating organization is to orient chaos toward purposeful knowledge creation (Nonaka, 1998).

Above all, what is needed is a change of culture among education systems. Such a culture would value all forms of knowledge—not only that measured by an achievement test or summarized in a peer-reviewed journal—and recognize the importance of creating and applying that knowledge in a collaborative, systematic way. Only then can this country expect to realize fully the vast potential of all its students.

References


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