

Chapter 7

FOSTERING INQUIRY AND ITS COLLATERAL LEARNING

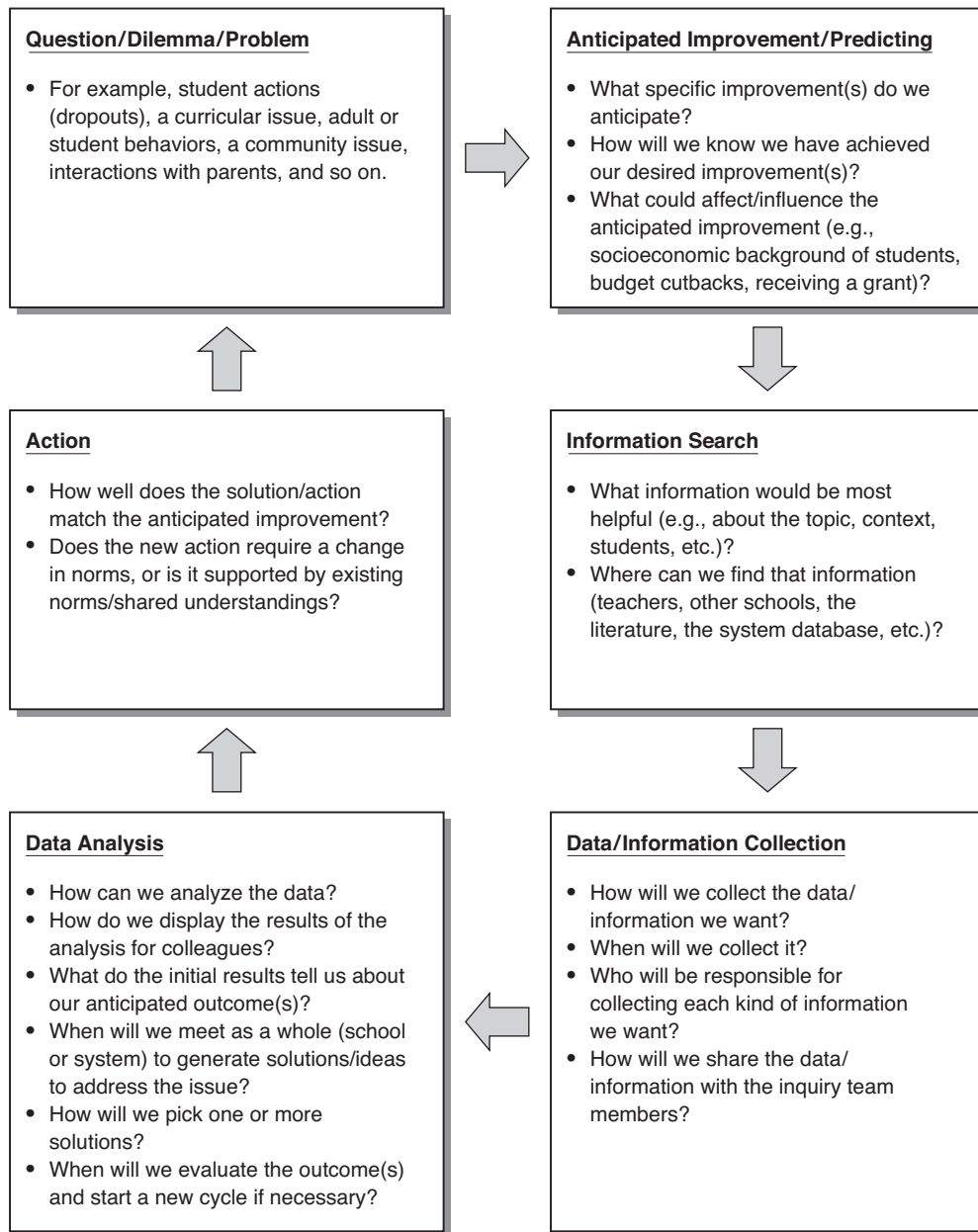
Why Is Inquiry Important for Organizational Learning?

The inquiry process encourages organizational members to detect and correct errors and access tacit knowledge. Without inquiry, members cannot learn about or from their assumptions or actions.

INQUIRY: A SPECIFIC KIND OF LEARNING

Ever since Aristotle recognized and articulated the importance of inquiry, it has continued to interest both theorists and philosophers. In much of the education and organizational learning literature, there is acceptance of the idea that inquiry is an important mechanism for learning. For example, Argyris and Schön (1996) viewed inquiry as error detection and correction, both of which are necessary for organizational learning. Whether inquiry is individual or collective, formal or informal, direct or indirect, it is fundamentally a specific kind of learning with specific purposes. Direct inquiry is the purposeful pursuit of feedback and testing of assumptions or claims, a necessary part of organizational learning (see Chapters 2, 3, and 4). Indirect inquiry is the purposeful surfacing of tacit knowledge (e.g., insights, ideas, perceptions) to understand or make sense of the environment and to stimulate innovation.

Practitioners, especially if they have pursued graduate studies, are likely familiar with the direct inquiry cycle (Figure 7.1). By its very nature, inquiry stems from curiosity, “the highest fuel for the engine of learning” (Kegan & Lahey, 2001, p. 83). It requires problem identification, data collection, analysis/interpretation, and action. The action(s) taken may then spawn new questions or problems, restarting the inquiry cycle and igniting further learning (Dewey, 1933/1960; also see Argyris & Schön, 1978). In addition, inquiry promotes “the mental elaboration of [an] idea,” “playing with concepts,” and “developing the relation of ideas to one another” (Dewey, 1933/1960, pp. 107, 182, 113).

Figure 7.1 Collective Inquiry Cycle

There is another kind of inquiry that is vital to organizational learning: indirect inquiry to surface members' tacit knowledge. This chapter discusses both direct and indirect inquiry, elaborating their roles in developing helpful attitudes and in encouraging innovations vital to organizational renewal.

Inquiry Case Study

Pinehurst faculty: Sandy, Alena, Tom (principal), Erin, Damian

Members of the visiting team: Jaime (superintendent), Lorie (principal), Sue, Ken

Jaime, the visiting superintendent, had barely sat down at the second session before saying to the Pinehurst teachers and principal, "You decided fairly quickly to engage in inquiry. Why did you start with that condition?" After a brief silence, Sandy said, "I'm not sure we actually intended to start with inquiry, but when we looked at Pinehurst's strengths and weaknesses, student learning emerged as a real concern. We also figured we would have the greatest teacher interest and participation if we started here. I mean, at that time, most of us were still pretty much focused on our kids and our classrooms. We really weren't thinking much about the school as a whole. Damian had mentioned that Pinehurst students had difficulty when they went to his old high school and that they were affecting the learning of incoming students from the other feeder schools. We—well, some of us here at Pinehurst—were also keenly aware that other middle schools were trying some really neat stuff with their students, so student learning was a high priority at the beginning."

Ken's puzzlement was clear. "So if you started with the learning condition, how did you get from there to the inquiry condition?" Alena tried to explain. "I think adults can't help but learn no matter which condition they work on, so in that sense, it sounds like the learning condition." She laughed as she turned to her colleagues. "We certainly had a steep learning curve with collective inquiry because only Tom and Damian were familiar with the inquiry cycle. Little did we know how much we would learn that year! And not much of it was happy news, like when we found out how poorly Pinehurst students were doing when they got to high school and how many dropped out of school. The problem was, we didn't know exactly what was or wasn't going on with student learning because even though we worked in the same building, we did our own thing in our own classrooms, and we didn't really talk much about student learning. We had to start an inquiry cycle to find out what was or was not going on. Damian can explain the process better than I can."

"Well," Damian said, "the topic of student learning was huge and pretty vague. I mean, topics are often too broad at first and have to be narrowed. They also have to be within our capacity to explore instead of being a wish list we can't control. But that doesn't mean that we don't have aims and ideals, so the first thing we did together as a faculty and staff was to brainstorm three things. Each of us pretended we were a student and wrote down what we thought great learning would be. Next, as teachers, we wrote down personal individual strengths we have concerning student learning. Finally, each of us thought of the greatest unit we've ever taught and wrote down why students liked it and why they really seemed to learn the concepts. We recorded our responses for those three pieces."

"We had a really hard time narrowing down our inquiry questions and somehow ended up with two questions instead of one: How do Pinehurst students do when they get to high school? How can we engage current students better at Pinehurst now? When we had our questions, Tom asked who would like to serve on the inquiry team for student learning. You're looking at those first brave members," Damian grinned as he pointed to the Pinehurst faculty members.

Damian paused to ask Tom to get copies of the collective inquiry cycle for the visitors (Figure 7.1) and then continued. "When the inquiry team first met, we used the cycle to help us. For example, the teacher responses about great learning served as guides for how we would know we had achieved our desired improvement. We thought that one specific improvement would be greater high school achievement and attendance. We thought that the hiring of new teachers who had already worked on organizational learning in other schools would really be helpful. Erin, do you want to explain the information search?"

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"We started out with the question: What do we already know?" Erin said, and before she could continue, she was drowned out by laughter and a chorus of "Not much!" Erin thought for a moment and then said, "You know, we did know quite a lot. The teachers' comments on their greatest units really helped us. Also, when our new superintendent first arrived, he organized a systemwide database on the Web called 'Innovations and Improvements.' Each time a school tried something new or worked through an inquiry cycle, part of the job of the inquiry team was to summarize what they did and what the results were. They also listed some really good literature or other sources they used and what they would do differently in retrospect. So the first thing our team did was to go to the Web site."

"The superintendent had also developed various other databases," Erin continued. "There was a database on student statistics—you know, dropout data, number of student transfers, that kind of thing. He also set up various teacher listservs, and so we sent out a blanket e-mail to everyone in the system: Do you know any good books or articles on how to engage middle school students in learning? And we had three teachers at Pinehurst who were taking master's courses at the university, and they were a good source of information, too. Of course, we realized right away that talking to our current students, our former students now in high school, and their high school teachers was also important. We even tracked down a couple of dropouts. Now that was quite an earful!"

Damian thanked Erin and continued. "I should mention that each time our inquiry team met, we always sent an e-mail with the meeting agenda to each adult here at Pinehurst so that if people were interested in that particular part of the process, they could attend. Not many did, but they seemed appreciative of being kept in the loop. Once the team had identified and recorded our sources of data, we all read the literature sources. We asked ourselves: What new questions did the literature raise? What ideas and strategies did the literature offer? Using that background and the teachers' brainstorming ideas, we jointly created a student survey for current students and some interview questions for former students now in high school, some of our high school students' teachers, and the dropouts we had located. Then we divided up the work and set timelines for finishing the data collection."

Sandy broke in. "That's when this particular cycle got really interesting," she said. "I held a focus group interview with some of our former students who are now in high school and a different focus group interview with some of their current high school teachers. The high school teachers didn't want to talk at first. Some of them seemed to think we'd blame them or think they weren't doing their job. Scheduling meeting times was kind of tough, too, because all of us run extracurricular activities. But when I finally got the data, it was amazing how the two sets meshed. The kids and the teachers were able to identify pretty easily where the kids were having difficulty and what could have helped them."

Alena dramatically laid both hands over her heart as she said, "I got to talk with the dropouts! What an eye-opener! And when I checked the high school database, I discovered that Pinehurst students had the highest dropout rate in the system. That was truly unbelievable!" "Facts don't lie," Sandy said quietly, "but that doesn't make them any easier to hear. I guess we didn't want to hear the bad news. There was quite a lot of denial at first. Some teachers were quick to blame our kids' socioeconomic situation, but there are other schools like ours and yet we had the highest dropout rate—by a lot. Other teachers said, 'Look, we have to be realistic. Many of our students are going to drop out of high school no matter what we do.' There was a point when I thought we might slide right back to where we had been before Tom came."

The heavy silence was broken by Tom. "What we did next," he said, "was to collate and display our findings to show the whole faculty and staff and parent representatives at a meeting. We gave an overview of constructivist and humanistic theories of learning and their underlying assumptions and beliefs and had an open discussion of how those are or are not compatible with what we were doing in our classrooms or were willing to try. Then we summarized strategies and ideas from other schools and sources, as well as our own results. We had also prepared a list of

questions for discussion, and it took two more meetings to work through these questions: Which strategies or ideas from the brainstorming, the literature, and our findings are compatible with Pinehurst's aims and our brainstorming ideals of great learning? What are the strengths and weaknesses of each strategy or idea? Which ones would likely work in our school or could be adapted to work here? Why? Could student or parental feedback on the possible strategies help make them even better? How do these possibilities match our anticipated improvement ideas? How should we proceed?"

Sue, from the visiting team, spoke up. "I'm not sure I understand your last question," she said. "I thought once you picked a program or a strategy, you were finished." Sandy grinned at her and nodded. "So did I," she laughed, "but I learned instantly that once you start an inquiry cycle, you're never really finished because it morphs into a new cycle. You see, once we agreed on some of the things we wanted to change—like identifying key concepts in each subject, having students help design the curriculum, and using real-life projects for the kids—we had to strike another team to carry on. They asked questions, too: What new issues do we predict? What kinds of staff development do we need? How could other middle and high school teachers help us change our instruction and assessments? Should we phase in changes one year at a time or at all three grade levels simultaneously? How many evaluation checkpoints should we build in to monitor our progress? What should those evaluations look like? So you see," Sandy concluded, "the inquiry process never really ends. We all keep rotating in and out of inquiry teams depending on the new questions."

INQUIRY: A WAY OF THINKING

When organizational decisions come from top management, inquiry is not particularly necessary. In the knowledge society, however, inquiry is vital in organizations that want to learn. We remind readers that in the inquiry process, *error* is not necessarily a mistake; it is a mismatch between intended outcomes and actual outcomes (i.e., a school may have implemented a strategy to help students learn, only to find that results stayed the same). There is no sense in seeking to blame anyone, especially if organizational members made the best joint decision they could at the time. Error correction means that members direct their energy toward the next step (e.g., evaluating why the strategy did not work and figuring out what else can be done to move forward). Table 7.1 indicates emerging shifts in thinking that help support inquiry in organizations.

INQUIRY AND ATTITUDES

Inquiry is unusual in that the inquiry process itself generates some new ways of thinking; that is, engaging in the inquiry process not only leads to new learning, but also can develop or strengthen *collateral learning* (Dewey, 1933/1960). Dewey (1938) referred to collateral learning as "learning in the way of formation of enduring attitudes, of likes and dislikes" and argued that "the most important attitude that can be formed is that of desire to go on learning" (p. 48). He also noted three other attitudes "favorable to the use of the best methods of inquiry" (Dewey, 1933/1960, pp. 29–30). The first is open-mindedness, "an active desire to listen to more sides than one; to give heed to facts from whatever source they come; to give

Table 7.1 Collective Inquiry: A Way of Thinking

<i>From</i>	<i>To</i>
<ul style="list-style-type: none"> • Inquiry is an add-on (not part of the job description) • “Yours is not to question why” • Problems remain ambiguous (e.g., broad and poorly defined) • Reliance on assumptions and hunches without testing them • One-size-fits-all decisions or solutions are imposed from above and relied on • Trial and error, fads, uncertainty, repetition of errors are commonplace • Employees not expected to examine thoughts and practices • Errors hidden or covered up 	<ul style="list-style-type: none"> • Inquiry is an integral part of organizational membership • Questions are vital to detect and correct errors • Problems are clarified and clearly defined • Reliance on data, informed judgments, and decisions • Those close to the situation find appropriate solutions • Cycles of inquiry move the organization toward its aims and ideals • More informed members and increased collateral learning (open-mindedness, interest, desire to learn, intellectual responsibility) • Errors detected and corrected

full attention to alternative possibilities; to recognize the possibility of error even in the beliefs that are dearest to us” (p. 30). He identified a second attitude as whole-heartedness—“genuine enthusiasm” (p. 32) or “absorbed interest” (p. 33). The third attitude is responsibility. Being intellectually responsible involves thoroughness, along with a willingness to “consider the consequences of a projected step [and to] . . . adopt these consequences when they follow reasonably from any position already taken” (p. 32; also Gardner, 1963/1981).

What is interesting about inquiry is that the very prerequisites it demands—a hospitable attitude toward learning (Huysman, 2000), tolerance of new ideas, openness to improvement, and risk taking in the form of willingness to confront mistakes or weaknesses in behavior or thinking (Dewey, 1933/1960)—are the same attitudes that inquiry fosters. In other words, the act of engaging in inquiry strengthens the attitudes and ways of thinking valued in organizational learning: curiosity, learning, open-mindedness, searching for evidence, generating multiple possible solutions, considering consequences, taking action to correct errors, and continuing to improve.

Inquiry and Attitudes: A Reciprocal Process

inquiry → desire to learn → inquiry
 open-mindedness
 absorbed interest
 intellectual responsibility

DIRECT INQUIRY

Organizational members in school frequently engage in direct inquiry, the kind of inquiry depicted in Figure 7.1. For example, teachers regularly engage in informal inquiry that can occur at lightning speed, such as figuring out a workable course of action if students seem to be having a disruptive and unfocused day. In the course of seconds or minutes, the teacher may identify the issue, consider a repertoire of experiences that have been successful in the past, select an activity, discard the intended lesson, and take a new course of action. On other occasions, inquiry may represent a more formal inquiry cycle, such as a systemwide team of teachers engaging in lesson study to determine how teachers can improve students' understanding of fractions. Perhaps a school faculty engages in inquiry on how they might increase parental involvement in their child's schooling. Regardless of the kind of inquiry, each cycle begins with a question born of curiosity or a dilemma (e.g., frustration, lack of understanding, a necessity to change).

The Importance of Questions

Anyone who has been in the company of two- or three-year-old children knows that their favorite question is why. The children are asking questions as they try to make sense of the world around them. Asking questions is also a “fundamental characteristic of organizations that learn” and a practice that is central to renewal (Preskill & Torres, 1999, p. 60). Questions represent the first step in stimulating inquiry and are necessary for pushing learning to deeper levels—especially “why” questions. By contrast, organizations that are not serious about learning can cut off questions by creating norms that interpret questions as challenges to authority. They try to prevent questions that could be embarrassing, expose unethical behavior, or hold the highest officials accountable for poor decisions or misleading information (e.g., the Enron scandal). Such organizations usually have no mechanisms for serious inquiry, but they do have a formidable arsenal for preventing inquiry (see Organizational Memory in Chapter 12). Precluding questions stops inquiry and thwarts organizational learning.

Furthermore, the nature of the questions people ask virtually determines the usefulness of the answers they develop. It is easy to short-circuit the inquiry process by asking shortsighted questions that are likely to lead to shortsighted answers (Bellinger, 2004). Teachers are familiar with the kinds of classroom questions that elicit yes/no responses or retrieval of some factual information. They are also familiar with *open-ended questions*, which provoke deeper thinking and more detailed and varied responses. Questions in the classroom have the same function as questions in the inquiry cycle.

One of the major reasons for inquiry is to foster possibilities and broaden perspectives, but closed questions that beg only a yes or no response tend to narrow the inquiry and may prevent the organization from getting answers it needs. Systemic questions, on the other hand, focus on the relationships of parts or dynamics within the system. As inquirers pursue their questions, they become aware of the many different variables affecting the system, the many sources of information available to them, and the many new possibilities and solutions available to them. By working through the process their questions set in motion, inquirers begin to deepen their understanding and see the system and their own situation differently. It is through inquiry and through the cognitive changes within themselves during the process that they begin to open their minds to broader perspectives and new ideas.

Inquiry and Change

Dewey's (1933/1960) careful analysis of how people think and learn particularly emphasized the importance of inquiry under conditions of uncertainty and change. Inquiry, therefore, seems especially essential for schools, given that teaching is increasingly being characterized as a decision-making process conducted under conditions of unpredictability and uncertainty in highly interactive settings (Conley, Schmidle, & Shedd, 1988; Doyle, 1985; Lytle & Fecho, 1991). Teachers in several countries have purposefully engaged in inquiry or *action research* for a number of decades. However, teachers' learning through inquiry became more prominent in the Western world following widespread interest in Schön's (1983, 1987, 1991) work, which expanded the earlier ideas of Dewey and applied them to the workplace.

In education, a number of authors have since espoused the idea of teacher inquiry as a powerful tool for professional development and school improvement (e.g., Cochran-Smith & Lytle, 1993; Fosnot, 1989; Hopkins, 1987; Osterman & Kottkamp, 1993; Tabachnick & Zeichner, 1991; Tikunoff & Mergandoller, 1983). In 1996, the National Commission Report on Teaching and America's Future signaled that teacher inquiry should become an expectation for all teachers. It also reflected a new way of thinking: authorizing those closest to the situation to take appropriate action to resolve curricular and instructional issues (e.g., try new ideas, experiments, interventions) rather than waiting for central administration to take unilateral action or make one-size-fits-all decisions.

The Importance of Collective Inquiry

As important as the emphasis on teacher inquiry was, it nevertheless focused only on individual inquiry. Individual inquiry may be appropriate for classroom issues, but not for broader school issues that affect all organizational members (e.g., dropouts, drug use, curriculum coherence, assessment). And whereas individual learning is necessary for organizational learning, it is not enough. Big issues and organizational learning call for collective inquiry.

The aim of collective inquiry in schools is to increase knowledge and improve practices. The act of working through an inquiry cycle—whether formally or informally—creates and uncovers new knowledge that allows organizational members to propose more informed potential solutions and to make more knowledgeable decisions. In the absence of experience with inquiry and because schools still do not have established norms “to promote inquiry or to add to the intellectual capital of the profession” (Lortie, 1975, p. 56), teachers may perceive inquiry—individual or collective—as an unwanted and time-consuming add-on to their many responsibilities. With assistance, however, they can begin to appreciate inquiry as a valuable, job-embedded form of learning and improvement.

It appears that the inquiry process and the attitudes it fosters may best flourish when colleagues conduct inquiry collectively. Collective learning experiences that involve developing shared understandings through coordinated action “increase individuals' exposure to a variety of ideas and experiences. They also provide access to a greater variety of referents for feedback and for assessing one's own ideas, performance, and needs for learning” (Smylie, 1994, p. 156).

Because collective inquiry is not yet a common tradition in schools, teachers often intuit or identify problems without knowing how to follow through with collective inquiry. For example, schools frequently identify an issue that is important to many teachers (e.g., low

reading scores among students). They may identify the issue based on data such as systemwide testing or without data, the latter alternative carrying the risk of superstitious learning. Schools also frequently leap from identifying the problem to identifying a solution without asking enough questions. Sometimes a new reading approach or reading program is quickly adopted and implemented, only to fizzle after several years. Several experiences like this may reinforce the observation of some experienced teachers, who ignore the change as a fad or who think that “this too shall pass.” By avoiding questions that could lead to collective inquiry and more thoughtful decisions, schools miss the opportunity to clarify the premise (e.g., which aspects of reading are weak? for which students?), consider why reading might be an issue, discuss multiple alternatives rather than accepting the first solution someone proposes, investigate the fit between the school’s aims and the aims of potential approaches or programs, explore the success rate of a program under consideration, and examine implications and consequences of each alternative possibility.

One benefit to collective inquiry is that it potentially increases groups’ problem-finding and problem-solving skills as well as the amount of information brought to bear on decision making. As Shrivastava (1983) noted, “organizational learning is closely linked with experience that the organization possesses. Through previous experience in a decision area or activity, the organization learns to adapt its goals, selectively attend to its goals, selectively attend to its environment, and search for solutions to organize problems” (p. 17). In one study, school principals were able to find “participatory ways to mobilize teachers in addressing critical school problems, and then supply the appropriate resources that respond[ed] directly to those problems” (Rosenholtz, 1989, p. 203). A more recent initiative that may encourage more collective inquiry is a new norm being forged as a result of the No Child Left Behind Act in which schools have to examine test data. Whether and how the use of data on student achievement will change instructional practices or teacher performance review processes remains to be seen.

A further benefit of collective inquiry is that it is linked to double-loop learning; that is, it has the capacity to restructure organizational norms and change prevailing theories-in-use. The quality of inquiry between single- and double-loop learning is different. Inquiry related to single-loop learning tends to find new strategies to meet the new external or internal change or demand and to maintain or increase efficiency. Inquiry related to double-loop learning tends to:

- Reformulate mistaken assumptions
- Specify incongruities
- Clarify ambiguity
- Bring together scattered information
- Surface information that is withheld (Argyris & Schön, 1978)

A related benefit of collective inquiry is the potential to increase teacher satisfaction. Goodlad’s (1983) empirical research indicated that the most satisfying schools exhibited three “indices of self-renewal: continuous evaluation of programs, examination of alternative procedures, [and] willingness of faculties to try new ideas” (pp. 54–55). Part of teachers’ satisfaction may come from helping students or improving their own practices, and part may come from the satisfaction derived from taking action to resolve a problem rather than merely identifying it but feeling incapable of doing something about it.

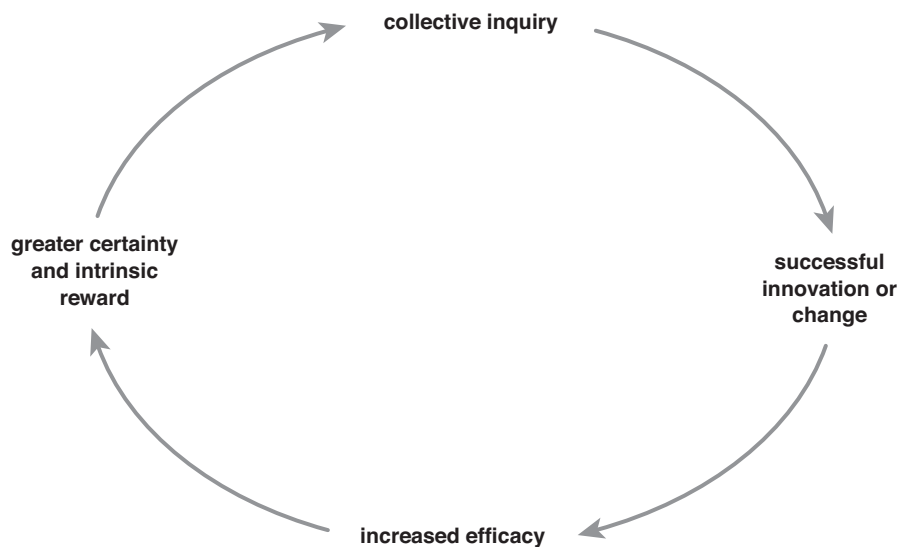
Example of Collective Inquiry and Openness to New Ideas

One school's original data indicated that student attendance had fluctuated sharply (Rait, 1995). The teachers, worried about the difficulty of teaching well under the circumstances, conducted further study to seek a solution. As part of the process, they reasoned that "students would benefit from more intensive and regular contact with at least one adult, and that adult would be in a good position to learn what kinds of assistance individual students needed and know how to access appropriate resources." The new action the school took was to create small "family groups" of students who met with an adult two to five times weekly (p. 100). Readers are not told the attendance results of the new strategy, whether the intervention was monitored, or how teaching changed (i.e., a new inquiry cycle). In the absence of this information, the organizational learning of this collective inquiry cycle appears to have resulted in single-loop learning.

Inquiry and Renewal/Continuous Improvement

When teachers (or teachers and administrators, or an administrative team) engage in inquiry together or try innovative practices without fear of threats, they seem to set in motion a cycle of renewal. For example, if teachers see successful student learning as a result of their efforts, their efficacy increases. This generates greater teacher certainty and intrinsic (psychic) rewards, encouraging the teachers to learn and innovate again (Rosenholtz, 1989). This cycle of renewal (Figure 7.2) is captured in the common saying, Success breeds success.

Figure 7.2 Collective Inquiry as Double-Loop Learning



Because the action taken at the end of one inquiry cycle often sparks new ideas or questions to explore, the power of inquiry lies not only in the intellectual satisfaction of learning about the issue that prompted the inquiry process, but also in its ability to suggest new directions for learning. By uncovering new avenues or questions to pursue, inquiry is a potent mechanism for continuous learning and improvement.

Example of Inquiry as Continuous Improvement

The faculty of Rolling Hills Elementary School was disappointed in the parent turnout for parent-teacher conferences. Because the faculty believed that parental involvement has a strong influence on student achievement, they wanted to improve parental attendance on scheduled conference evenings. They decided to send a questionnaire to parents to find out why parents were or were not attending conferences, when parents would prefer to attend if given a choice, and what the school could do to involve parents in their children's education. To the faculty's surprise, responses consistently indicated that parents would come in the evening if baby-sitting services were provided at the school and that many single parents held second jobs in the evening but were willing to attend conferences early in the morning.

The school made the necessary accommodations, substantially boosting parental turnout. Buoyed by their success, the faculty wondered what else parents wanted. This time, questionnaires indicated that parents wanted short workshops on proficiency testing, gangs, and discipline without tears so they could better assist their children at home. The school's next step was to run the workshops for parents and supply baby-sitters on the same mornings or evenings as the conferences so that parents had to make only one trip to the school for both events (Collinson, 1996a).

Inquiry has also been linked to the renewal of organizations through innovation. In short, organizations must have innovators to renew themselves and cope with constant uncertainty and change. Gardner (1963/1981) argued that "a strong tradition of freedom of thought and inquiry is essential to continuous renewal" and warned that innovators in organizations often need to be protected (p. 33). His caution was affirmed by Lee (2001), who observed that although companies look for and depend on innovations, employees might not divulge innovative ideas if they are afraid to test them. For example, in a large health care organization, employees were willing to experiment if managers "explicitly stated that making mistakes would be okay, and refrained from punishing employees for errors" (p. 29). Experimentation was rarer when managers' espoused theories (encouraging experiments and expecting some experiments to fail) did not match their theories-in-use (a reward system that punished failures or compromised career moves). In addition to engendering fear and mistrust, "the effects of an inconsistent message were particularly strong among lower-status individuals [e.g., medical students], who tended to have the greatest fear of failure" (pp. 29–30). If, like the medical students, novice teachers have the greatest fear of failure or the highest anxiety (Lortie, 1975), not only would innovation and experimentation in schools suffer, but fear of failure would continuously *reinforce* individual learning instead of group learning and repetition of old habits instead of innovation.

INDIRECT INQUIRY

We have referred to engaging in the inquiry cycle as direct inquiry. This inquiry may be formal or informal, individual or collective, fast or slow. However, there is another kind of inquiry we will call indirect inquiry. Indirect inquiry involves the surfacing of tacit knowledge or making tacit knowledge explicit. It is used in organizations (often in dialogue or meetings) to elicit perceptions, brainstorm ideas, make sense of or interpret the environment, seek clarification, or arrive at new understandings. Indirect inquiry is still poorly understood from a research perspective although we suspect everyone has experienced it. For instance, readers may have taken a walk to clear their head, only to discover that changing their activity and focus produced a new insight or a solution for the problem that drove them to take a walk in the first place. Sometimes a good night's sleep, thinking about something else, or dinner with friends produces a new idea. Sometimes organizational groups go on a retreat. They may hike or paddle canoes for several hours before holding a brainstorming meeting. It is not uncommon to hear comments such as, "We got a lot done in a short time" after such meetings. In these kinds of circumstances, people have laid aside the issues and let their brains rest or relax by focusing on something pleasantly unrelated to the issue, only to find that ideas or perceptions coalesce effortlessly or pop into their minds. They are giving time and free rein to their tacit knowledge, allowing their minds to create solutions, insights, discoveries, innovations, or ideas. They are engaging in what we call indirect inquiry, the inexplicable world of ideas.

Indirect inquiry refers to the surfacing of tacit knowledge into the realm of consciousness. Tacit knowledge does not behave at all like explicit knowledge, and indirect inquiry does not proceed in the same way as the cyclical inquiry process that produces explicit knowledge. Rather, tacit knowledge is

nonintentional, nonlinear, and nonvolitional, and thus is best attended to indirectly. When it is attended to indirectly, the chances are increased that the "fragments" of a covariant in the environment, a troubling problem, or an incipient solution—unverbalized, and without intentional direction or consciousness—will progress from "fragment" to "form," and then suddenly enter our consciousness. (Kikoski & Kikoski, 2004, p. 84)

Tacit knowledge cannot be coerced or produced on command. It appears to function as a free spirit, unpredictable and unscheduled, within the same brain that represents rational thought, designs routines, likes linearity and predictability, and worries about time constraints. Tacit knowledge seems more in tune with chaos and quantum theories that describe the next state of the world as unknowable and unpredictable, much like the complex and unpredictable environment that organizations face today. As schools and school systems collectively scan the environment and seek to innovate in order to self-renew, they will increasingly have to elicit members' tacit knowledge to avoid reinventing the wheel or learning by trial and error. Tacit knowledge can help organizations develop innovations that are most suitable to their particular context or make adjustments based on a robust understanding of that context.

Recent understandings of tacit knowledge, limited as they are, underscore that tacit knowledge is not only free but also fragile in the sense that it requires a hospitable work environment in which to function (e.g., the outdoors or relaxed environments we mentioned earlier). Managers thinking within a modern, industrial tradition might worry about workers "goofing

off” or wasting company time by chatting and telling jokes around the coffee machine. At the same time, they recognize the wisdom in the old adage, “All work and no play makes Jack a dull boy.” Tacit knowledge is unscheduled. “It is more easily accessible and expressed in an environment in which not much is asked of it, and it is entirely free of constraints and tension,” yet can be suppressed by even the smallest nonverbal disapproval (Kikoski & Kikoski, 2004, p. 85). By the same token, it is likely that an organizational environment that values free flows of ideas and encourages risk taking and innovation will unleash tacit knowledge (i.e., support indirect inquiry), whereas an environment of fear, control, or rigidity will suppress indirect inquiry. Given the importance of tacit knowledge to organizational learning, organizations can work to establish norms that allow the purposeful surfacing of tacit knowledge through dialogue and meetings.

Inquiry and Sensemaking

Sensemaking resembles inquiry in that both are processes rather than a series of problems that can be “fixed once and for all.” Observation and experience indicate that solutions are generally temporary. “Processes and sequences and routines and patterns, the stuff of the world, tend to repeat themselves. . . . Problems keep showing up over and over because solutions seldom alter the dynamics of the process” (Weick, 1995, p. 187). In school systems, for instance, teachers know that each year, they will have to deal with bullying and other discipline issues over again, except with different students. Superintendents know that some principals and teachers will leave the system and be replaced or that a new budget will anger some taxpayers. The context or actors change and dilemmas are resolved in different ways, but the issues are only temporarily managed; they will recur in new ways. The important point is that “organizational inquiry can proceed only by concerting inaccessible information, by clarifying obscure information, and by resolving the inadequacies in organizational theory of action (the mistakes, incongruities, and inconsistencies) which clarification reveals” (Argyris & Schön, 1978, p. 85).

We are indebted to Weick (1995) for pointing out the similarities between sensemaking and inquiry, both of which involve shifting from automatic thinking to active thinking. The shift from an unconscious to a conscious mode occurs when people notice a discrepancy, something novel or unusual, serendipitous or troublesome, a difference between expectations and reality. When they pay attention to it, recognize that it is a discrepancy, look for cues, and act on them, they are engaged in the process of making sense of the situation. Organizations commonly use this process when faced with uncertainty. Sometimes, they have to deal with uncertainty or *ambiguity in the form of ignorance* (not enough information to make rational interpretations); sometimes, they have to deal with uncertainty or *ambiguity in the form of confusion* (feelings of confusion over lack of clarity, high complexity, or multiple conclusions). Although both kinds of situations require sensemaking, the former requires discovery, and the latter requires invention (Weick, 1995).

“D” is for Discovery and Direct Inquiry

It is useful to review the difference between ambiguity as ignorance and ambiguity as confusion as it relates to inquiry. Ignorance in this context means not knowing. An example of not knowing might occur when a middle school wants to know how successful the language

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arts curriculum has been. The purpose is clear to members; what they need is more information. In other words, “ambiguity understood as ignorance created by insufficient information calls for more careful scanning and discovery” (Weick, 1995, p. 95). Teachers may have anecdotal snippets of information based on their own observations or students’ comments, but they likely want to look at students’ work samples before and after implementation of the new curriculum, or they may want to get feedback from the high school teachers of the students who used the curriculum throughout middle school, and so on. These kinds of situations reflect ambiguity as ignorance and therefore require discovery in the form of direct inquiry.

“I” is for Invention and Indirect Inquiry

Inquiry to reduce ambiguity as confusion is less familiar to practitioners. This kind of situation calls for invention, not discovery. Invention comes from within and requires face-to-face communication. Instead of looking outside the organization for expertise and information, members have to think together to socially construct new meaning in light of the dissonance between expectations and outcomes and in consideration of their particular context. If the sensemaking process is ignored and teachers are told to implement the new solution, members may be set up for yet another layer of confusion, especially if the new practice creates dissonance with existing practices (see Weick, 1995).

Organizations tend to overuse discovery although many difficult situations really call for invention, which requires indirect inquiry. For example, schools and school systems have a strong tradition of calling in experts to provide “the right answer” or trying out “the latest and greatest” fads to ensure school improvement. This norm suggests the view of “fixing things once and for all” instead of an ongoing process toward continuous improvement. Trying to improve the school without having discussed what school improvement means is likely to be a futile process in the long term. *School improvement* is a fuzzy concept, with many interpretations and many potential solutions. Without discussion, members may lack shared understanding and clarity concerning the meaning of the term and the purpose of the decision. Members do not need more information; instead, they need to clarify the purpose and meaning through indirect inquiry. If the school immediately tries to collect data through direct inquiry without clarification, members will likely have difficulty articulating a useful question to begin the inquiry cycle. In this way, indirect and direct inquiry can complement each other; tacit knowledge is particularly helpful in clarifying and selecting questions for direct inquiry.

ESSENTIAL QUESTIONS

Following are some essential questions for members of schools or school systems to consider before and after a collective inquiry cycle.

Direct Inquiry

- What methods are in place to encourage members to identify issues for inquiry (e.g., a drop box, a permanent item on staff meeting agendas, safety to raise issues with principals and colleagues)?
- What direct inquiry does the school/system engage in (formally or informally)? Who is included in the inquiry?

- How do members decide which questions to address?
- How do the inquiry questions relate to the school's/system's main educational aims or ideals?
- How do stakeholders know they have accomplished their anticipated improvement(s)?
- How has inquiry helped stakeholders think systemically or broaden their perspectives?
- If an inquiry led to some change, how was the change later evaluated? Did the evaluation consider only behavioral change(s) or both behavioral and cognitive change(s)? How were unintended consequences of the change addressed?

Indirect Inquiry (Members' Tacit Knowledge)

- What circumstances seem to encourage new ideas, insights, connections?
- Do members identify situations when indirect inquiry is needed to clarify or resolve confusion?

GETTING STARTED ACTIVITIES AND IDEAS

Principals typically talk about “putting fires out” or “stopping the hemorrhaging with band-aid solutions.” Schools frequently scurry to find and implement a strategy some other school has used successfully although copying “best practice” from somewhere else can be risky because the people involved, their values and attitudes, and the context or community may be very different. But what would happen if schools identified the *sources* of problems? After all, how can a school or school system adopt a solution without carefully defining the specific issue and investigating why it is an issue? Or what would happen if schools and school systems examined their own missteps in dealing with an issue? Could they not learn a great deal about the issue by identifying what *isn't* working and why it isn't working?

Teachers who are accustomed to one best practice or reform after the next also have pet sayings such as “I'll wait this one out.” They might also say, “Why do we have to throw the baby out with the bath water each time a new reform comes along?” The baby can only be thrown out with the bath water if the practitioners who are expected to implement the new reform have not examined what is already working well in their school or school system. A great deal can be learned if educators ask what's working and what isn't working.

Learning may begin with curiosity, uncertainty, or a dilemma that has to be resolved. Learning may also begin when someone or something shakes our worldview or challenges a belief we hold. One way to kick-start learning is to challenge our own assumptions, the goal of the following activity. This activity also establishes some baseline data. The baseline information is important as a future reminder of how far the group has progressed over time.

Activity 1—What's Working? What Isn't Working?

Step 1: Ideally, these two questions should be answered by at least three groups: adults in schools (teachers, support staff, administrators), students, and parents. If working with all three groups makes the task too intimidating, begin with the adults in the school. Each person has a sheet of paper with two columns: one for “what's working” and one for “what isn't working.” Be clear that, contrary to the popular notion of critique or criticism, a critique encompasses *both* positive and negative aspects; hence, both questions deserve careful reflection. Be clear

that no backstabbing or retribution will be allowed, no matter how painful some of the negative critiques may initially appear.

Step 2: Once the critiques are completed, a volunteer group compiles a composite of each of the responses. All responses must be included (i.e., no selective censorship). The volunteer group should also categorize the responses (e.g., curriculum, communication, staff meetings, etc.).

Step 3: At a meeting of the whole, discuss the “what’s working” responses and collectively try to determine *why* those things are working. Maybe they tend to focus directly on student learning, maybe they are all issues the faculty agreed on previously, or maybe they just happen to support instruction.

Step 4: The same procedure is followed for the “what isn’t working” question. Collectively, the group should again analyze *why* the particular practice is not working. It may be that the practice can be linked to the six conditions (e.g., it doesn’t foster learning, it hinders healthy human relationships, it blocks sharing).

Step 5: Each person gets a copy of the compiled responses to “what isn’t working” and is asked: What needs to be changed? (The group may have to initially target only the most serious issues if categories of issues were numerous.) Everyone generates as many suggestions as possible of what should be changed to improve each issue. Shoot for the stars! If you catch yourself saying, “I don’t think we could do that,” write the idea anyway.

Step 6: At one (or more) meetings of the whole, the group discusses all the proffered suggestions and decides which issues to change first and how to implement those changes. A date should be set to check whether the implementation has helped and whether it may need further refinement. In time, the same process can be used to resolve remaining issues. The activity can be institutionalized by using it one or more times a year following its initial use.

Activity 2—Force-Field Analysis

Force-field analysis is a useful tool for conducting school inquiry and strategic planning, especially with a group of people. It promotes systems thinking by creating a way to examine both the positive and negative forces that influence behavior in concert. It lets members create a systemic picture of their current situation and suggests ways to move toward a desired target. The greatest advantage of force-field analysis “lies in the fact that its technique can easily be mastered. . . . [It] recognizes the need to consider complex fields of forces and myriad influences rather than single or isolated factors” (Sanders, 1977, pp. 145–146). As Lewin (1951), the theorist who developed force-field theory, explained,

What is important in field theory is the way the analysis proceeds. Instead of picking out one or another isolated element within a situation, the importance of which cannot be judged without consideration of the situation as whole, field theory finds it advantageous, as a rule, to start with a characterization of the situation as a whole. After this first approximation, the various aspects and parts of the situation undergo a more and more specific and detailed analysis. It is obvious that such a method is the best safeguard against being misled by one or another element of the situation. (p. 63)

As we take you through the steps of the activity, we present an example to help you better understand the process.

Step 1: The process starts by deciding on a target or goal. The goal can be large or small, personal or organizational, short term or long term. (For example, a school might decide that its goal is for all children to read at or above grade level by the time they graduate.) Goals

that you might want to consider using with school personnel could relate to fostering the six conditions, enhancing organizational learning, or implementing school or system initiatives.

Step 2: Make an honest appraisal of your current situation. Where are you right now in terms of moving toward your target? (In our example, let's say that only 60% of students are demonstrating that they can read at grade level, but teachers believe the group is closer to 50% because many poor readers were absent or excused from testing.) Depending on your target, your appraisal of your current situation may need to be less specific; for example, we are just getting started or we are doing this well but see some ways to improve. However, be sure to consider how you would know whether you are making progress.

Step 3: Brainstorm *motivating forces*. These are forces that motivate members to move toward the target. (In our example, district pressure as well as a belief that the ability to read is central to students' success might be motivating factors.) In your brainstorming, you can consider beliefs, school norms, resources, laws and regulations, fears, school structural elements, needs, knowledge, and pressures from various school constituents. These are forces that drive the school toward change.

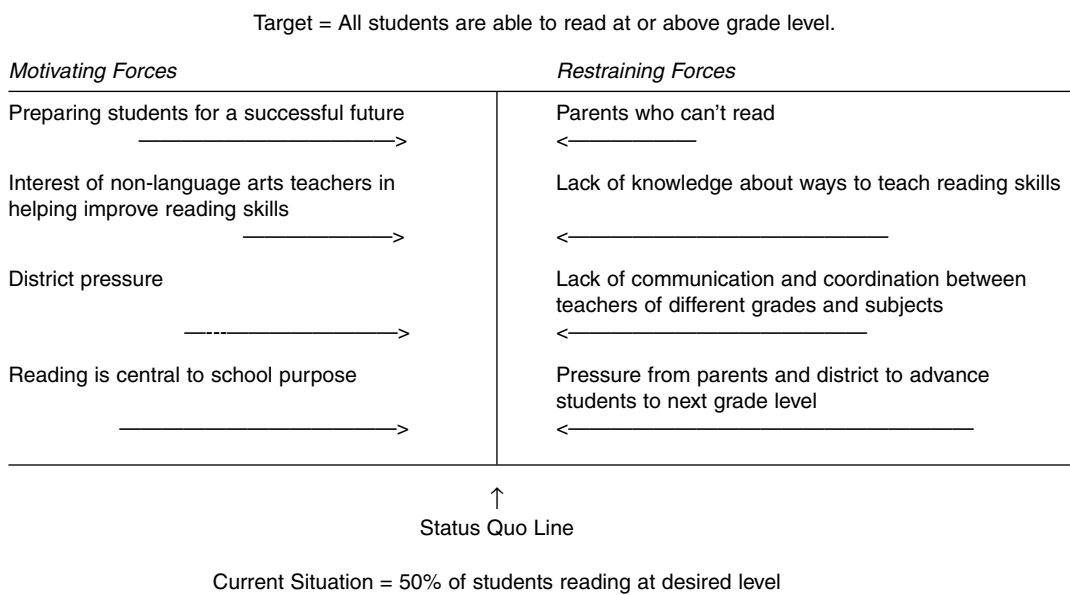
Step 4: Consider the strength of each of the motivating forces. You can assign each force a number or use a relative scale for a given force (e.g., very influential, influential, slightly influential, or not influential).

Step 5: Brainstorm *restraining forces*. These are forces that create resistance to change or impede movement toward the target. (In our example, pressure to advance students to the next grade and parents who can't read or can't read well make it harder to ensure that all students can read at or above grade level.) As with the motivating forces, consider all the different kinds of forces affecting progress toward your target.

Step 6: Rate the strength of each of the restraining forces using either numbers or a relative scale, just as you did for the motivating forces.

Step 7: Draw a force-field diagram. Look carefully at the example below. Figure 7.3 represents the current environment with the line in the middle showing your current situation or the status quo. The arrows on the left represent motivating forces. The length of each arrow shows the strength or influence of that force. You can think of the arrows as encouraging the desired behavior and pushing the status quo line toward the target. The arrows on the right represent the restraining forces and again their length shows their strength. They are forces that prevent progress toward the goal rather than necessarily pushing you backward or in the wrong direction. As you are drawing the diagram, feel free to reassess the strength of motivating and restraining forces. Sometimes, seeing a larger picture can provide new insights. If you have had a productive brainstorming session, you may want to show only the strongest forces in your diagram. However, keep the whole list for future use. As your situation changes, new forces may grow in importance.

Step 8: Force-field analysis yields a snapshot in time that provides a systemic explanation for the *existing level* of a desired behavior (in our example, teaching students to read well). You can use it as a guide to decide how to proceed toward your target. What changes are suggested by the force-field diagram? How will proposed strategies affect the forces? What changes will have the most impact? What might be an easy place to start? Lewin (1951) suggested that *reducing* restraining forces is generally a preferable method. Decreasing restraining forces allows existing momentum toward change to prevail whereas *increasing* motivating forces is likely to increase the level of tension accompanying a change process. Working to increase motivating forces has the potential to produce "greater fatigue, higher aggressiveness, higher emotionality, and lower constructiveness" (Lewin, 1951, p. 218).

Figure 7.3 Example of Force-Field Analysis Diagram

Idea 3—Institutionalizing School Inquiry

Japan has designed a system that keeps schools aware of the importance of inquiry and of the expectation of continuous improvement. Schools are required to define a schoolwide issue/curiosity/dilemma every three years and then systematically search the literature and collect data to make an informed decision to resolve or improve the situation during that time period. They are also required to publish their findings and work so that other schools may benefit from their ideas, methods, findings, and decision(s).

In the United States, teachers may not have learned how to conduct action research (or other forms of inquiry) unless they have recently pursued a master's degree. Faculties may need help from a knowledgeable insider or an outside specialist the first time they engage in the inquiry process. Some themes of interest that impact learning for students may include bullying, absenteeism rates and patterns, dropouts, inclusion practices, and standardized testing.

Further Reading

- Schmoker, M. (2001). *The results fieldbook: Practical strategies from dramatically improved schools*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Schmuck, R. A., & Runkel, P. J. (1994). *The handbook of organization development in schools and colleges* (Chapter 6). Prospect Heights, IL: Waveland Press.
- Schön, D. (1991). *The reflective turn: Case studies in and on educational practice*. New York: Teachers College Press.
- Supovitz, J. A., & Klein, V. (2003, November). *Mapping a course for improved student learning: How innovative schools systematically use student performance data to guide improvement*. Available: www.cpre.org

Reflective Journal

Continuous learning and improvement are ideals of organizational learning. Inquiry is an important pathway to improvement because it inherently promotes continuous or cyclical learning. In addition, the attitudes that support inquiry, coupled with the process itself, can make schools/systems productive, rewarding, and stimulating places to work. The questions in this chapter are intended to give you insight into the inquiry process and its related attitudes in your school/system.

1. To what extent is the attempt to resolve problems in your school/system characterized by fads, one-size-fits-all solutions, mandates, trial and error, uncertainty, or repetition of errors? To what extent is inquiry used instead?
2. Inquiry involves a cyclical process of questioning, predicting, data collection, data analysis, and action. Are there places where the cycle breaks down in your organization? If so, why might that be? What could be done to support the inquiry cycle?
3. As a cyclical process, inquiry fosters and benefits from people's desire to continue learning. Can you think of any inquiry topics that would pique the interest of members of your school/system and thus promote a desire to learn?
4. Questions drive the inquiry cycle. How are questioners treated in your school/system? What kinds of questions are welcomed? Are there any kinds of questions that are taboo?
5. The relevance and clarity of answers discovered through inquiry are usually related to the quality of questions driving the cycle. What is your opinion of the quality of questions in your school/system? Are they clear? Are they answerable? Are they likely to result in answers that will change actions? Are they systemic? To what extent do members in your school/system help each other clarify and clearly define questions and underlying problems they seek to examine?
6. Dewey (1933/1960) indicated that open-mindedness, whole-heartedness, and intellectual responsibility are three attitudes that are favorable to inquiry on the individual or group level. To what degree do you think that members in your school/system display each of these attitudes? How well do leaders in your organization model each of these three attitudes? Can you think of any cultural, structural, or other organizational factors that affect these attitudes? How can these attitudes be encouraged and supported in your school/system?
7. What helps members of your school/system consider and accept new ideas? Does it make a difference who suggests the idea? Does it make a difference if the idea is promoted by an individual or a group? Does it make a difference whether the ideas are internally generated or externally imposed?
8. Inquiry related to double-loop learning tends to reformulate mistaken assumptions, specify incongruities, clarify ambiguity, bring together scattered information, or surface information that is withheld (Argyris & Schön, 1978). Is inquiry in your school/system more related to single-loop or double-loop learning? What could your school/system do to further facilitate double-loop learning through inquiry?



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9. This chapter presents many benefits to pursuing inquiry collectively (e.g., increases members' knowledge and the group's pool of knowledge, exposes members to others' ideas, increases the group's problem-finding and problem-solving skill set). To what extent do you see evidence of collective inquiry and its related benefits in your school/system?
 10. How would you rate your school/system using Goodlad's (1983) "indices of self-renewal: continuous evaluation of programs, examination of alternative procedures, [and] willingness of faculties to try new ideas" (pp. 54–55)? How might renewal be strengthened in your school/system?
 11. Indirect inquiry involves surfacing tacit knowledge and using invention to reduce ambiguity. What conditions or events in your school/system help elicit insights, intuitions, hunches, and other types of tacit knowledge? How else could tacit knowledge be elicited? What happens to insights, intuitions, and hunches once they have been elicited?
 12. What other thoughts did this chapter evoke?
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