

Analytic Processes for School Leaders

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Thinking About Questions

Questions are the important thing, answers are less important. Learning to ask a good question is the heart of intelligence. . . . Questions are for thinkers.

—Schank, 1991

When it comes to handling life's issues, we all need to be thinkers. And to be good thinkers, we need to ask good questions. Whether we are students, teachers, administrators, or parents, being a skilled questioner is fundamental to resolving issues effectively. Answers matter, but without questions, there are no answers. If we can ask the right questions, we can always find the right answers.

Each of the four thinking processes we examine in depth comprises a series of sequenced questions. These questions help identify, solicit, organize, and analyze the information vital to effective problem solving.

Much has been written about the importance of questioning. In this chapter, we examine some reasons questioning has been, and continues to be, important. We focus on why questioning is critical for effective issue resolution. For example, as we successfully address any issue, questioning allows us to do the following:

- Clarify and frame messy or ill-structured problems.
- Identify and gather missing information.
- Sort through available information and arrive at conclusions.
- Better understand the needs and beliefs of stakeholders.
- Solicit others' opinions and analyses of a situation.
- Increase commitment to a solution by raising the quality of that solution and involving others in the decision-making process.

Why Learning to Question Is Increasingly Important

We are part of a revolution in information technology. Through computers, the Internet, media, and other communications technology, we have ready access to more information than ever before. That information changes rapidly and quickly becomes obsolete; it is estimated that half of what an engineering graduate learns is obsolete within four years (Rubenstein, 1998).

Access to information increases, and the information changes more rapidly than our ability to acquire or master it. Gone are the days when we could be content masters or gurus. The real gurus now are the people who know how to sort through, assess, and *use* relevant information. According to Patricia Vail, “The educated person used to be the one who could find information. Now, with a flood of data available, the educated mind is not the one that can master the facts, but the one able to ask the ‘winnowing question’” (Vail, in Healy, 1990, p. 338).

This information explosion, and the rapid obsolescence of information it helps create, require us to become lifelong learners. Taking charge of our own learning means that we should ask questions to determine what we need to learn and to obtain and digest the necessary information. In today's world, we cannot be passive learners who rely on others to tell us what we need to know. According to Postman and Weingarten (1969), learning to ask questions is the key:

Once you have learned how to ask questions—relevant and appropriate and substantial questions—you have learned how to learn and no one can keep you from learning whatever you want or need to know. (p. 23)

As changes occur in the workplace and in the education arena, we are expected to work effectively with a wider range of people. Experts from a variety of disciplines and backgrounds must increasingly work together to resolve the issues that face their school, district, and organization.

When Teachers Ask the Questions

According to Degarmo (in Wilen, 1991), good questioning means good teaching:

To question well is to teach well. In the skillful use of the question more than anything else lies the fine art of teaching; for in it we have the guide to clear and vivid ideas, the quick spur to imagination, the stimulus to thought, the incentive to action. (p. 5)

Most of the current focus on teaching looks at questioning as either a primary teaching vehicle (e.g., Socratic questioning) or as an additional tool to support, extend, or reinforce teaching. Asking questions is one way to engage learners in the learning process. Questions can encourage deeper thought and investigation, and they can serve as a jumping-off point for further study. We know that the more learners are involved in the material, the more they understand and the longer they retain that understanding (Goodlad, 1984).

Let's look at what else is known about the use of questioning in the classroom. Wilen (1991) conducted a review of research about questioning practices in the classroom. Among his findings were the following:

- Studies show that, in general, a positive correlation exists between frequency of questioning and increased student learning. One study shows that a 5 percent increase in higher-order questions posed by teachers resulted in a 40 percent increase in the quality and depth of student answers. Other studies show mixed results and little correlation between higher-order questions and the quality of the answers.
- Elementary teachers said they use questions in the classroom mainly to assess the effectiveness of their teaching, diagnose areas of difficulty, and check recall. The survey results suggest that teachers see questions primarily as vehicles to assess what the students know and how well they have been taught—not to stretch students' thinking or force them to think in new ways.
- Teachers ask 300 to 400 questions daily. Elementary teachers tend to ask more questions than junior high teachers. Experienced senior high teachers tend to ask more questions than inexperienced teachers.
- Another study of 6th grade history teachers found that 77 percent of teacher questions were factual (i.e., required factual answers). Only 17 percent of teacher questions required students to do more than recall facts. Studies of junior high and gifted students found that most questions require simple memorization to answer. A study of high school social studies students found that more questions were asked at the memory level than all other types of questions combined.

Goodlad (1984), in his landmark study of schools, assessed how students and teachers spent their time in class. He found these facts:

- An average of 75 percent of class time was spent on instruction.
- Of this instructional time, 70 percent was oral—primarily teacher-dominated talk. Teachers outtalked their students by a ratio of 3 to 1.

- Ninety-five percent of this teacher talk was instruction through telling; no response was required from the students. Students were required to reason, provide opinions, share thoughts, and so forth less than 1 percent of the time.

Cecil (1995) discusses a 1992 study by Bromley, which confirms the predominance of factual questions in the classroom: 75 percent of the questions teachers asked were factual. In 30 minutes of observation, teachers asked, on average, 70 factual questions. Factual questions predominated in a review of written material as well. In basal readers, 50 percent of the questions were factual. (The study can be found in Bromley, 1992.)

Even though the need to understand certain facts and information is clear, an overreliance on factual questions has a price: It encourages passive learning, rewards short-term memory over the ability to synthesize information, discourages creativity, and reinforces in children the belief that facts are more important than their own thoughts or evaluations of ideas (Cecil, 1995). One study shows a specific condition that produced a positive correlation between the questions students were asked and the answers they gave: When students were taught to recognize the type of question asked, the quality of their answers improved (Kyzer, 1996).

Why would teachers place such reliance on these lower-order questions? Some suggested reasons are that such questions allow students to give quick and concise answers (Cecil, 1995), and they allow the teacher to control the pace and atmosphere and avoid the uncertainty of messy answers (Eales-White, 1998). Because there are “right” answers for these types of questions, teachers don’t have to deal with the uncertainty that open-ended and higher-order questions tend to encourage. They can quickly assess the accuracy of the answer and move on or reteach. Another reason teachers rely on lower-order questions is that they have seen this type of question modeled. Without further skill development, teachers tend to teach the way they were taught. Our curricula also tend to be fact oriented, not thought oriented (Johnson, 1992). It thus stands to reason that recitation of facts is what we test for and reward.

Researchers who compared U.S. teachers to Japanese teachers found that “they ask questions for different reasons in the United States and Japan. In the United States, teachers ask questions to get answers, but in Japan, teachers pose questions to stimulate thought. In fact, they consider questions to be poor if they elicit immediate answers because this indicates that students were not challenged to think” (Berryman & Bailey, 1992, p. 58). These findings were further reinforced in an article (Olson, 1999) examining a well-known study involving video-taped classrooms in three countries. The article describes a study by Stigler and Hiebert, who analyzed videotaped classrooms in the United States, Japan, and Germany. In Japan, effective instruction was seen as that which forced students to stretch. If students wrestled with a concept, they were required to think. This approach was seen as an effective lesson. In the United States, most teachers provided the concepts to students. If students struggled at all with the concepts, the U.S. teachers would immediately “retreat and repeat” the lesson. (The study can be found in Stigler & Hiebert, 1999.)

When we review the literature on questioning, it is clear that, to date, the majority of attention has gone to teacher questioning. Actual classroom practice reflects the reality of this emphasis. Cecil (1995) found that for every question a student asked, teachers asked 27 questions. Other studies verify these findings in elementary through secondary school classrooms. One study found an average of 84 teacher-generated questions during a class hour and two student-generated questions. Over the course of a school year, this practice translates into each pupil asking one question each month (Dillon, 1990).

When Students Ask the Questions

Let's look at some reasons for students to develop their own questions:

- *Increases motivation to learn.* Learners of all ages are motivated to learn the answers to questions, especially when they play a role in framing the questions. Learning immediately becomes more relevant to the learner, and relevance increases the learner's desire to know. “Understanding is question driven. To understand we must be able to ask questions, to wonder about things we are reading or hearing about” (Schank, 1991, p. 209).

- *Improves comprehension and retention.* Students comprehend and retain more when they construct their own questions (Cecil, 1995). Not only are students more motivated to learn, they are also more likely to learn when they form and investigate the answers to questions they have developed. One technique that distinguishes competent readers and thinkers is that they are able to generate and consider questions about the text (Cecil, 1995).
- *Encourages creativity and innovation.* We have already mentioned that answering factual questions engenders passivity. To further our thinking and see things in new ways, we need to be able to ask new questions. Posing and investigating questions drive our creativity (Schank, 1991). Vail notes, "By engaging students only in a quest for the correct answer, rather than for the interesting question, we condemn them to live inside other men's discoveries" (Vail, in Healy, 1990, p. 295).
- *Teaches how to think and learn.* Earlier in the chapter, we talked about the importance of developing skills for lifelong learning. Learning how to ask questions helps students take charge of their own learning and thinking both in and out of school. Depending on others to generate the questions breeds dependence on others for our own learning and growth. According to Beyer (1987),

Using teacher-asked questions as the major device for guiding students in the use of thinking skills contradicts a major goal of the teaching of thinking—making students dependent on someone else to initiate and direct thinking. An active thinking student ought to be able to generate and direct his or her own thinking. Learning how to invent one's own question enables students to achieve this goal. (p. 154)
- *Provides a basis for problem solving and decision making.* Asking effective questions is basic to solving problems. If we are not able to ask good questions, we cannot obtain or analyze information that will enable us to arrive at sound conclusions. Without questions, we are forever dependent on the information and conclusions of others. The greater our ability to ask good questions, the more we can take charge of our own problem solving and help others with theirs.

What Constitutes Good Problem-Solving Questioning?

Imagine a situation in which a student asks a teacher for help choosing a topic for a science project. Let's look at two possible ways the conversation might unfold, then examine the kinds of questions used in the two scenarios.

Conversation A

Teacher: Have you thought about photosynthesis? You seemed to be really interested in plants, and I don't believe anyone else is doing something in this area.

Student: You're right. I love gardening and working in the greenhouse. But I also love animals. I have several pets at home.

Teacher: I didn't realize that. Of course, several students already have chosen projects involving pets. Don't forget that there are limited library resources, so the more projects there are on a given subject, the fewer books will be available. Are you interested in endangered species of animals?

Student: I guess so, but I like finding out more about my own animals.

Teacher: What about a project that combines plants and animals? Like maybe looking at the nutritive value of plant matter in dog food?

Student: It seems so chemical oriented. I like playing with my animals.

Teacher: Let's try to think of another interesting plant topic. How about comparing the hardiness of different strains of tomatoes—or comparing the effectiveness of various organic pest controls?

Conversation B

Teacher: What are some things you are interested in and why do they appeal to you?

Student: Well, I like gardening because I get a lot of satisfaction from taking care of something and seeing it grow. There is no feeling like eating a carrot you've grown from seed. I guess that is partly why I also love spending time with my pets. It feels good to take good care of them. And I like teaching them new things. Did you know that I show my dog in obedience classes?

Teacher: I had no idea. It sounds like you have a pretty clear understanding of some possible areas of interest. What else do you think you might want to consider in choosing a topic?

Student: Well, I have had trouble checking out books from the library when too many people are working on similar things. So, I guess I'd like to choose something that was a little different. Also, I need to choose something I can work on at home or through the Internet. It's hard for me to get rides anywhere. I'd really like to do something with my dogs.

Teacher: What topics would allow you to work with your dogs, work at home, and also be somewhat unusual?

Student: I don't know. How about something with dog training—like using dogs for search and rescue or to help physically challenged people? Or I've heard something about pets being able to predict earthquakes and things like that. I've also heard about intelligence tests for dogs.

Teacher: Those all sound like intriguing projects. What's a next step?

Student: I'll think about it over the weekend and give you something on Monday if that's okay. Thanks a lot for your help. You've given me some great ideas!

Examining the Conversations

Consider the two conversations as you read these questions:

- Which conversation requires the student to think more?
- In which conversation do we learn more about the student's interests and considerations?
- After which conversation is it most likely the student will feel ownership over the solution (topic chosen)?
- In which conversation are questions asked that are most easily transferable to other decision-making situations?

If you answered Conversation B to all the questions, we agree. What do you notice about Conversation A? Do you notice how hard the teacher has to work? Even though it is the student's project, the teacher is valiantly trying to generate ideas and help. The teacher in Conversation B used *process* questions, while the teacher in Conversation A used *content* questions. Figure 2.1 compares process and content questions.

Figure 2.1. Comparison of Process and Content Questions	
Process Questions	Content Questions
Tend to be open-ended.	Tend to be closed-ended.
Apply to any situation.	Apply to a specific situation.
Generate much information from few questions.	Generate little information from many questions.
Put burden of knowing content on answerer.	Put burden of knowing content on questioner.
Systematically probe for information gaps.	Randomly find information gaps.
Develop thinking skills of answerer.	Produce limited developmental benefit.

Even though the figure shows the value of process questions, we know that teachers tend to ask content questions—those that require recall or recitation of information. We have discussed evidence of this finding, which comes from studies that identify the kinds of questions asked in the classroom. Teachers must know something about the content to be able to ask these kinds of questions. Such questions tend to be closed-ended; that is, only a finite and well-defined set of answers will satisfy them. On the other hand, process questions (such as those in Conversation B) tend to be open-ended; the questioner can draw out relevant information, organize and analyze it, and ask questions without knowing the content. The teacher in Conversation B is more effective at encouraging the answerer (in this case, the student) to do his own thinking to arrive at conclusions.

Content questions are a necessary part of our questioning repertoire, whether we're problem solving or not. They are, however, not sufficient; they have limitations. To rely primarily on content questions is equivalent to trying to build a house with only a hammer. We can do a lot of things with that hammer, but we will also leave a lot undone.

Process questions have the following characteristics:

- *Have a purpose.* Contrary to some questioning strategies that emphasize the quantity or type of questions asked, problem-solving questions focus on the purpose of the question. If we know exactly what kind of information or input we are looking for, we are able to modify or develop questions that will help us achieve our goal. To resolve an issue, the result of the questioning, not the activity of questioning, is important; that is, questioning is important because of the information we obtain, the judgments we make, and the way we involve others.
Each of our four analytic processes has an overall purpose or goal, and each step or question within the process clearly contributes to that goal. Good questioning for issue resolution means that every question has a clear-cut purpose and that we question until that purpose is met. Knowing the purpose allows us to better form the question.
- *Are effectively sequenced or organized.* Once the purpose of the questions is clear, we can effectively sequence the questions we ask. Many questioning strategies don't emphasize the

need for a sequence or pattern of questions. Research suggests that teacher effectiveness increases when the questions follow some kind of rhythm or pattern and when some purpose exists for asking those questions (Wilten, 1991). When we solve problems, the sequence of the questions is critical. The problem-solving processes themselves provide the rationale for sequencing the questions. For example, in decision analysis, we need to understand the objectives or goals for the decision before we can effectively evaluate the options. Therefore, questions about objectives must precede questions about alternatives. Random questioning increases the chances that we will overlook critical data and waste valuable time and resources.

- *Effectively involve others.* Effective use of questioning in problem solving presumes that we may need information, ideas, and the involvement of others. But we all know people whose actions suggest they don't value involvement. Those people engage in the following practices:
 - They don't ask questions of others; they make decisions themselves.
 - They ask others but disregard or ignore others' input.
 - They ask leading questions that belie their bias and encourage others to concur.

What results from these actions? People who do not involve others lose the opportunity to improve the quality of their solution. They typically receive limited support for their solutions. They pay the price during implementation as they try to force, cajole, or convince others, after the fact, that their choice is correct. People who pretend to value others' input and then ignore it engender resentment and, ultimately, cynicism from those with whom they work. Those who co-opt others through leading questions tend to think they have support when they really don't. By never honestly seeking others' input—only their tacit agreement—these individuals create feelings of disenfranchisement in colleagues and subordinates.

Seeking others' input doesn't mean we have to use it or agree with it—just that we consider it. Questioners must value what the answerer has to offer, whether it is data, opinions, observations, or ideas. In problem solving, if we do not value the answers, the questions become an exercise in irrelevance, and the opportunity for learning (for both questioner and answerer) is lost.

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Research has demonstrated that both teachers and students can be encouraged to learn and apply the skill of asking effective questions. One study shows that when this skill was taught, students were able to effectively ask critical questions. The more they practiced the skill (i.e., the more questions they asked), the better their questions were. They were much more engaged in the learning process (Cecil, 1995).

We believe it is vital for all of us to develop the ability to ask effective questions. This ability is particularly important if we are to be effective in resolving the issues that confront us. After all, successful issue resolution requires us to effectively involve others and obtain and analyze relevant information. How else can we accomplish this task than by asking the right questions?