Chapter 1:

How Can Quality Questioning Transform Classrooms? Questioning to Advance Thinking, Learning, and Achievement

Focus Questions

How can effective questioning help transform a traditional, teacher-centered classroom into a student-centered, inquiry-oriented community of learners?

What are the connections between quality questions and student learning and achievement?

Why are there gaps between what we know about effective questioning and what we do in classrooms?

Questioning. Thinking. Understanding. These three processes interact in a dynamic fashion to advance student learning, performance, and achievement. Think of these classroom processes as action verbs that create the energy for student work, the fuel for learning. Can you picture the vitality of the teacher and students in a community of learners committed to questioning, thinking, and active understanding? Consider the following vignette, which embodies one vision for such a classroom. As you read this classroom scenario, imagine you are an observer whose task is to identify the norms, structures, and teacher and student behaviors that make this a student-centered, inquiry-oriented community of learners.

As you enter the classroom of A. Thoughtful Teacher, you immediately feel the energy generated by the students' curiosity and excitement for learning. Seated in groups of four, students are formulating collective responses to a focus question written on the whiteboard. The teacher asks the designated reporters from each group to raise their hands. She calls on one of them, who offers a response.

"Thoughtful" waits after the student stops speaking, then says, "I'd like to get behind the thinking that led you to this response. What reasons did you discuss?" The student elaborates on her initial answer. Thoughtful then asks the entire class if they can accept this answer as a well-reasoned one: "Thumbs up, if you think this is an acceptable response; thumbs down, if you cannot follow the argument."

Thoughtful scans the room, noting that all students have their thumbs up. She then asks if there were any different answers to the question. A student raises his hand, and Thoughtful listens actively to this answer, again probing to find out the reasoning behind the response. When this student completes his explanation, another student poses a question: "I want to know if your group identified examples of this concept at work." This student query prompts a five-minute interchange among students—with students from each small group participating.

Thoughtful asks the students to think back on the ideas they've heard in response to the initial question. She pauses for 10 seconds or so, then asks students to share the ideas they've identified—one at a time. As students speak, Thoughtful creates a concept map, which displays each idea and its relationship to others. She instructs the students to talk for a few minutes in their small groups about what this graphic organizer says to them. "As you talk," says Thoughtful, "identify any lingering questions you may have about this topic. Write each question on a separate Post-it note so that you can report out to the whole class."

Students talk quietly in their groups. As you look around the room, you note that all students seem to be engaged. You also observe that students are actively listening to one another and taking notes from time to time. While the students are discussing, Thoughtful moves around the room and listens in on each group's conversation. She seems to be monitoring each group's activity at all times.

After about five minutes, Thoughtful asks for lingering questions. She moves in round-robin fashion from one group to another, asking the designated reporter in each group to read one of their questions and post it in the designated area in the classroom. "If your group had the same question as a previous group, affirm their question and offer another if you have one." When the students' questions are exhausted, Thoughtful points to the six clusters of related questions and says: "I am really pleased with the thinking behind each of these questions. You are moving your thinking to higher levels. Look. These questions are at the evaluation level. What will we have to do in order to answer these?"

One student raises her hand; Thoughtful waits for another three seconds. Other hands go up. She calls on a student who did not speak in the previous discussion, who says, "We'll have to decide on what basis we'll make our judgments." Thoughtful waits, and the student adds: "You know. We'll need to develop some criteria so that we can determine which of our answers are appropriate."

Thoughtful looks around the room of these seventh graders—making eye contact with each student. She states: "I am pleased at the way each of you have honored our classroom norms today." She points to the norms posted on one of

the bulletin boards and continues: "I could tell that you were actively listening to one another because you did a lot of "piggy-backing" on one another's responses—and you questioned one another. This type of listening is really key to our thinking together."

She then asks the students to identify other norms that they honored during the discussion. She writes the students' comments beneath a column on the board headed with a plus sign. "Are there ways we might improve our discussions?" she wonders aloud. "Talk in your small groups about areas in which we may need improvement in our classroom community." Thoughtful asks for group sharing once again and posts these comments beneath a column headed with a minus sign.

Thoughtful looks at the clock and comments: "We have only five minutes of class left. Would you open your journals and make your entry for today—noting how you felt about your own participation in class? What helped you learn today? What got in your way?" As the students reflect and write, Thoughtful moves to the doorway—ready to interact with students as they pass to another class.

Norms Shape the Learning Experience

What norms did you identify that seemed to guide the students and teacher as they went about the business of learning and teaching? Read through the following norms, and think about the extent to which each one is a part of the culture of A. Thoughtful Teacher's classroom.

- We all need time to reflect on past experiences if we are to gain new understandings.
- We all need time to think before speaking.
- We all need time to think out loud and complete our thoughts.
- We learn best when we formulate and answer our own questions.
- We learn from one another when we listen with attention and respect.
- When we share talk time, we demonstrate respect, and we learn from one another.

Did you note the instances in which Thoughtful provided students time to think—both before calling on a student to speak and also after an individual student stopped speaking? Teacher pauses at these two points promote student thoughtfulness, resulting in more complete and correct student answers.

A. Thoughtful Teacher is intentional in making room for student questions—both spontaneous and planned. Also, active and respectful listening—by both students and teacher—seems to be a hallmark of this classroom community.

The teacher encourages students to draw upon their own and their peers' experiences and prior knowledge as they grapple with new concepts and ideas.

If inquiry and individual engagement are to characterize a classroom, then the teacher must proactively work with students to establish norms that support this orientation. For example, a teacher might introduce the norm *We all need time to think before speaking* by sharing research from Mary Budd Rowe (1972) about Wait Time 1 in this manner:

> "Sometimes, when I ask a question, several of you raise your hands right away. You know an answer immediately and you want to share it! Others of you are still thinking. And that's OK. In fact, I'm going to ask all of us to take more time before we speak and to use that time to think. Because even if you have an answer right away, if you think about the question for a little while before you speak, you may come up with another answer or a better answer. Why do you think it would be good to take some time to think before speaking?"

Following some discussion by the students, the teacher might continue:

> "A researcher named Dr. Rowe has actually studied how long we should wait and think—and what happens when we take the time to think after a question is asked. She discovered that if we wait three to five seconds before anyone speaks, student answers are better! The answers are more complete, they are longer, and they are more 'on target' with the question. She also found that students are more sure of their answers. They don't just guess as often."

After students demonstrate an initial understanding of this norm, it can be reinforced through practice and feedback.

> "Let's try this Wait Time 1. I'm going to ask a question, and then I want all of us to say together, 'one-thousand-and-one, one-thousand-and-two, one-thousand-and-three.' Then I'll call on someone to answer. OK?"
>
> "How do the two major political parties in our country select their presidential candidates?—OK, one-thousand-and-one, one-thousand-and-two, one-thousand-and-three. Carmen."
>
> "How does it feel to wait that long before being called upon to answer a question?"
>
> "What might be the value of waiting and thinking before speaking?"
>
> "Now I want you to practice this in your teams. Team leaders,

you'll find a set of questions in your folders. You are to facilitate a team discussion, using Wait Time 1 after posing each question."

The teacher might circulate around the room, monitoring and making notes for feedback that she can give to the class at the end of the exercise. She could also invite individuals in the small groups to give feedback to their group leaders. Finally, she might debrief the activity with the whole group—probing again to encourage students to reflect on the value of this norm to their learning.

Norms can be defined as stated or unstated group expectations related to individual behavior. They develop formally and informally as people interact with one another; over time, these norms become behavioral blueprints for individuals to follow (Deal & Peterson, 1998). Teachers can use norms to help students become comfortable as active participants in their learning.

Structures "Scaffold" Behaviors

A. Thoughtful Teacher does not leave student participation to chance. She creates structures that engage *all* students in thinking and responding to *all* questions. She organizes students to work in cooperative groups. She considers individual students' strengths and personal qualities as she assigns them to work together in pairs or groups of four. Thoughtful knows that cooperative response strategies are powerful ways to engage all students in thinking, talking, and making meaning of concepts under study. Additionally, she incorporates signaled responses (e.g., thumbs up/thumbs down) and work samples (e.g., use of small dry-erase boards for individual responses)—especially to check for student understanding. Occasionally, she uses the traditional mode of questioning—posing a question and calling on individual students to respond—but this is the exception, not the rule.

Because student use of nonlinguistic representations is associated with achievement gains (Marzano, Pickering, & Pollock, 2001, p. 73), A. Thoughtful Teacher uses devices such as concept maps to help students connect new information, prior learning, and discrete bits of information. This, in turn, assists students in transferring new learnings to long-term memory.

In this student-centered classroom, students have many opportunities to reflect on their own thinking and learning. Thoughtful provides them with the tools, structures, and time for such reflection. Students reflect as a whole group when asked to what extent they honored classroom norms during discussion. Students also reflect individually through journaling. These planned opportunities for reflection reinforce Thoughtful's belief that this class is about each student's learning and that each student is responsible for his or her own learning.

Student and Teacher Roles and Responsibilities Change

The vision of a classroom as a community of learners challenges traditional views of teaching, learning, and questioning. The conventional model of teaching as "knowledge transmission" treats students as sponges that absorb a teacher's wisdom. In the traditional classroom, knowledge is static, inert, and independent of learners. Learning involves listening to the teacher, reading, and studying in order to recall information on demand. Teachers use classroom questions primarily to evaluate students' ability to remember information.

Thoughtful's classroom contrasts sharply with this traditional model. She views learning as a social activity that requires students to interact with their teacher and peers as they engage with the content. Her view of her role corresponds to the one presented by Wiggins and McTighe (2000, p. 298)—teacher as designer of curricular and instructional activities that facilitate the interactions required for learning to the level of understanding. This view of teacher and student roles acknowledges questioning to be a core function of both learning and teaching (Perkins, 1992; Hunkins, 1995; and Wells, 2001). Inquiry, constructivism, and active learning are compatible with this view of teacher and student roles.

Recent reports issued by professional associations in mathematics, reading, science, social science, writing, and art support this new view of teaching, learning, and questioning. Among the recommendations proposed by these national curriculum reports:

- *Less* whole-class, teacher-directed instruction (e.g., lecturing)
- *Less* student passivity (e.g., sitting, listening, receiving, absorbing information)
- *Less* presentational, one-way transmission of information from teacher to student
- *Less* prizing and rewarding of silence in the classroom
- *Less* classroom time devoted to fill-in-the-blank worksheets, dittos, workbooks, and other "seatwork"
- *Less* student time spent reading textbooks and basal readers
- *Less* attempt by teachers to thinly "cover" large amounts of material in every subject area
- *Less* rote memorization of facts and details (Thompson & Zueli, 1999, pp. 4-5)

Professional organizations recommend more experiential, inductive, hands-on learning; more active learning; more emphasis on higher order thinking;

more responsibility transferred to students for their work; and more cooperative, collaborative activity to develop the classroom as an interdependent community (pp. 5-6).

These recommendations led Charles Thompson and John Zeuli (1999) to the following view of instructional improvement:

> The key questions for reform . . . are whether teachers understand that students must think in order to learn and whether they know how to provoke, stimulate, and support students' thinking. . . . The idea that students must create their own understandings by thinking their way through to satisfactory resolutions of puzzles and contradictions runs counter to conceptions of knowledge as facts, teaching as telling, and learning as memorizing. (p. 349)

These authors argue that we teachers must focus our professional learning upon knowledge, skills, and beliefs that will enable us to move from the traditional classroom in which most of us spent our years as students to the more student-centered, inquiry-oriented classroom embodied in what we call a Quality Questioning classroom (p. 371).

"Learning is a consequence of thinking."

David Perkins, *Smart Schools: From Training Memories to Educating Minds,* p. 8

What would such a classroom look like? The chart on page 8 displays a range of teacher and student behaviors associated with a Quality Questioning classroom. Individual reflection and collegial dialogue around the beliefs, behaviors, and results outlined in this chart can serve as a beginning point for the type of transformative learning Thompson and Zeuli suggest. Notice that teachers assume different roles in recitation (where the primary purpose is to check for student understanding of content) than in discussion (where the primary purpose is to facilitate student thinking at the highest cognitive levels). Both types of interaction are valued and addressed. Shared beliefs underpin teacher and student behaviors and inspire classroom norms. The "Results for Students" column summarizes the predictable outcomes for learners in Quality Questioning classrooms.

Like Stephen Covey, author of *The Seven Habits of Highly Effective People,* we believe it prudent to "begin with the end in mind." The chart offers a graphical depiction of the kind of classroom we envision for readers of this book. Woven throughout each chapter in this book are tools and concepts teachers can use to turn this vision into a reality—for themselves and for their students.

What a Quality Questioning Classroom Looks Like

Shared Beliefs	Behaviors		Student Outcomes
Good questions help students learn. All students can respond to all questions. All students' answers deserve respect. Think time is important. Students will ask questions when confused or curious. All students can think and reason—beyond rote memory. Divergent thinking is important. Not all questions have one right answer.	**Teachers** • Ask clear, focused, and purposeful questions • Ask questions at all cognitive levels • Allow Wait Time 1 after asking • Allow Wait Time 2 after students answer • Give each student an equal chance to answer • Invite and allow time for student questions **During recitations, teachers** • Use a variety of response formats • Give appropriate feedback • Help students answer correctly—rephrase, prompt, and cue when needed • Ensure that correct answers are heard by all	**During discussions, teachers** • Probe and redirect • Encourage students to interact with other students **Students** • Pay attention to all questions and answers • Think of answers to all questions • Are on alert to answer all questions aloud • Answer questions at the appropriate cognitive level • Use wait times to think about answers • Give wait time to others when asking questions • Ask questions when confused • Ask questions when curious • Make meaning out of facts	**In the classroom, students** • Know facts • Develop understandings based on facts • Use knowledge to solve problems and make decisions • Develop new products and ideas • Make inferences and draw conclusions • Hypothesize and speculate • Know and use effective questioning skills: —rephrase, cue, probe, and redirect —use Wait Times 1 and 2 —give meaningful feedback —ask questions at different cognitive levels • Thoughtfully answer teacher and peer questions • Ask many high-quality questions

Questions and Questioning Form the Core of Teaching and Learning

As new views of teaching and learning emerge, so does a different way of thinking about questioning. Francis Hunkins (1995) observes

> We are shifting from viewing questions as devices by which one evaluates the specifics of learning to conceptualizing questions as a means of actively processing, thinking about, and using information productively. Many educators are weaning students from believing that questions are phrased to attain certain answers and are helping them to accept questions as key vehicles that elicit awareness of the diversity, complexity, and richness of knowledge. More educators are assisting students in comprehending that questions are linguistic goals that enable thinking and production of knowledge. (p. 4)

The kinds of questions that Hunkins suggests are not those found in a game of Trivial Pursuit, but rather those that lead learners to better understandings of the structure of knowledge and the relevance of this knowledge to their personal lives. Chapter 2 presents tools teachers can use to formulate quality questions that lead students to higher levels of thinking.

If questions are vehicles for thought, then the questioning process determines *who* will go along for the ride. *Teacher questioning behaviors affect which students learn how much.* For example, teachers tend to call on high achievers much more frequently than low achievers, which provides these academically able students with an additional edge. A usual result of this practice is that, over their years of schooling, low achievers become accustomed to low expectations. They tune out and turn off. Most of us can be much more intentional about equalizing response opportunities for all students in our classes. Chapter 3 presents strategies for actively engaging all students in thinking and responding.

Another way teachers influence student learning via questioning is through the use of *wait time.* The tendency to wait (or not) for a student response has been found to vary, depending on whether the respondent is a high achiever or a low achiever. The provision of cues, clues, and other prompts to students who do not immediately respond follow this same pattern. Our usual questioning patterns again favor the high-achieving students, and as a result, they derive much more from questioning episodes than do lower achievers in the same classroom. In Chapter 4, we'll explore ways to prompt students effectively so that they are more fully engaged in thinking and answering.

The questioning process is not only a vehicle for eliciting answers from students. It can also keep them thinking and learning beyond an initial correct response. What teachers do with student responses (e.g., move students to ask

their own questions or to extend a peer's response) has a dramatic impact on the extent to which students continue their journey of thinking and learning. Chapter 5 explores the impact of teacher feedback and other teacher moves upon student thinking and talking, while Chapter 6 looks at strategies to develop students as questioners.

Chapters 2-6, then, focus on questioning as the core of teaching and learning, while Chapters 7-8 show how a focus on questioning can enhance the professional learning of teachers. The remainder of Chapter 1 examines the gap between current and best practice in using questions to promote thinking and learning.

Gaps Exist Between Best Practice and Current Practice

You met A. Thoughtful Teacher at the beginning of this chapter. She exemplifies the use of questioning to promote thinking and learning. But "Thoughtful" is not typical of K-12 teachers. Studies conducted for well over 100 years about teachers' use of questioning strategies show that there has been very little change in classroom practice, related to questioning, over all those years.

A. Well-Meaning Teacher: A Look at Current Practice

To summarize current practice across our schools, we invite you to meet A. Well-Meaning Teacher, who believes—as do most of us—that classroom questions are very important to teaching and learning. If you asked Well-Meaning her reasons for asking questions, she would reply:

> *"Oh, well, that's easy to answer. I ask questions to find out if my students have completed their assignments and, of course, to let them know what I expect them to learn."*

And question she does! In a typical 55-minute class period, Well-Meaning asks an average of 50 questions, and she takes great pride in this.

> *"The more questions, the better, I always say! We have a lot of material to cover in this class—and it's my job to cover it all!"*

Well-Meaning almost always calls on volunteers to answer her questions—those who raise their hands first and look most eager.

> *"I like to reward those who've done their work."*

After calling on a student, Well-Meaning waits less than one second for the student to begin answering and then quickly calls on another.

> *"We don't have any time to spare. I have to keep things moving fast or I'll lose them. And I certainly wouldn't want to embarrass anyone."*

If a student gives an incorrect or incomplete answer, she usually says something like "uh-huh" or "okay" and redirects the question to another student.

"If a student tries to answer, I like to give her some credit for trying, but I can't waste valuable class time drawing her out."

Well-Meaning does not encourage student questions and intentionally avoids calling on certain students who always seem to have questions.

"It's in the best interest of everyone to stay on the subject. After all, we must cover all of the curriculum!"

We Don't Always Do What We Think We're Doing

Teachers seem to know what constitutes "best practice," but we aren't always good monitors of our own performance. In one study, for example (Susskind, 1979), teachers were asked the following questions about the ideal and actual rates of student and teacher questions:

- How many questions do you think you ask in a 30-minute period?
- How many questions would be desirable?
- How many questions do your students ask?
- How many student questions would be ideal?

What would your response be to these questions? In the study, teachers estimated that they asked 15 questions in a 30-minute period; they also thought that 15 questions was the desired rate of teacher question-asking. These same teachers estimated that students in their classes were asking about 10 questions, which was below their desired target of 15.

When these same teachers were observed, the data were very different from the teacher estimates. Teachers asked an average of 50.6 questions; students posed only 1.8 questions.

The teachers were shocked by these findings. In fact, they refused to believe them until they listened to an audiotape of their own classrooms and counted the number of teacher and student questions. This is evidence that we don't always do what we know to be good practice; and we may not even be aware of that!

What would an audiotape of your classroom reveal?

Research About Current Practice and Implications for Change

Look at each of Well-Meaning's practices and see what the corresponding research indicates.

Research Finding #1: Teachers ask many questions.

Well-Meaning asked 50 questions in a class period. It is a consistent and well-documented finding that teachers ask a lot of questions. Research conducted nearly a century ago showed that teachers asked between one and four questions per minute. In a summary of research on questioning published in 1971, Gall concluded that teachers typically ask between one and three questions per minute. In our own study (Appalachia Educational Laboratory, 1994), 95 teachers were asked to videotape themselves in a classroom episode where questioning was the primary instructional strategy; the average number of questions asked in 15 minutes was 43 (two to three questions per minute).

You may remember that Thoughtful posed very few questions. Which is better—only a few questions or many questions? Unfortunately, studies are not available on how the number of questions asked affects student learning. Many educators subscribe to the belief that fewer questions, well formulated and thoughtfully posed, do more to promote student thinking than a barrage of questions. Interestingly, however, it seems that asking questions is better than not asking. In a study of the effectiveness of the recitation strategy, in which teachers pose many low-level and recall questions, Gall and others (1978) found that students who participated in a traditional recitation (after reading a passage of text) learned more than students who were not asked questions about the reading.

Implication: Questions promote student learning. Teachers should plan their questions before asking to ensure that questions match the instructional objectives and promote thinking. A few carefully prepared or selected questions are preferable to large numbers of questions.

Research Finding #2: Most teacher questions are at the lowest cognitive level—known as fact, recall, or knowledge.

It makes sense that if teachers are asking one to three questions per minute, the questions do not require much higher order thinking. How much could students be thinking if they are responding to questions every 20 to 30 seconds? In fact, research confirms that only about 20 percent of the questions posed in most classrooms require thinking at higher levels (Gall, 1984).

The research that links the cognitive level of teacher questions to student achievement is mixed. In their review of studies, Redfield and Rousseau (1981)

concluded that the use of higher-level questioning is positively related to improved student achievement. Others have reached the opposite conclusion. Still other researchers have concluded that young students and low-income students—who are learning basic skills—benefit most from low-level questions; whereas middle and high school students appear to have higher achievement when exposed to more higher-level questions (Gall, 1984). Even with the differences in the findings, most researchers conclude that higher-level questions promote the development of thinking skills.

This area certainly needs more study. It is important to consider the context of the studies. It seems likely, in consideration of the nationwide emphasis on standards-based curriculum and instruction, that achievement tests today are requiring students to know, use, and apply information in more complex ways than were required some 20 or 30 years ago. If this is the case, then it seems that students would benefit from practice with this kind of thinking. To help students perform better on today's high-stakes tests, teachers should give students a range of opportunities to think—including knowledge questions as well as higher-order questions.

Implication: Teachers should purposefully plan and ask questions that require students to engage in higher-level thinking. Teachers should also help students become familiar with the different levels of thinking and help them be aware of the kind of thinking required by the question.

Research Finding #3: Not all students are accountable to respond to all questions. Teachers frequently call on volunteers, and these volunteers constitute a select group of students.

A. Well-Meaning Teacher calls on volunteers to answer questions—a time-honored approach in many classrooms. Researchers have used the term target students to identify those who dominate classroom discussion and recitations. In one study of fourth through eighth graders, target students talked more than three times as often as their classmates; 25 percent of the students never participated at all (Sadker & Sadker, 1985).

The presence of target students in most classrooms is particularly troubling in light of another research finding, that "students who regularly asked and answered questions did better on subsequent achievement tests than students who did not" (Strother, 1989). In this disparity between current practice and best practice, teachers are compelled to ask: How can we give all our students the opportunity to ask and answer questions, to participate in discussions and recitations, and to think out loud?

Implication: Teachers, not students, should usually decide who will answer questions. Teachers should use strategies that give every student an opportunity

to respond. They should also establish classroom norms indicating that every student deserves an opportunity to answer questions and that all students' answers are important. This will help the most verbal students monitor their own talking and allow other students an opportunity to respond to teacher questions.

Research Finding #4: Teachers typically wait less than one second after asking a question before calling on a student to answer (Wait Time 1). They wait even less time (usually 0 seconds) before speaking after a student has answered (Wait Time 2).

Well-Meaning, like most of us, has established a fast-paced pattern for classroom questioning. Her intention is to keep students engaged by having little "down time" in a questioning episode. Unfortunately, her rapid-fire pace results in just the opposite—students who are not engaged and not thinking deeply about the content.

Research findings on the effects of Wait Time 1 and Wait Time 2 are consistently positive. When teachers pause for three to five seconds—both after asking a question and after hearing an answer—more students participate in class discussion, their answers are longer and of higher quality, and achievement improves on cognitively complex measures. Researchers have identified other benefits as well (see Chapter 4 for a more in-depth discussion of wait time and its effects).

Several studies indicate, however, that teachers rarely pause after asking questions or getting responses. In our own study, for example (Appalachia Educational Laboratory, 1994), we found that after teachers posed questions, they waited more than three seconds for a response less than 12 percent of the time. After students answered, teachers waited three seconds or more less than one percent of the time. And after more than 90 percent of student answers, teachers waited no time at all, frequently interrupting the student's answer.

Implication: Silence can be golden! Both Wait Times 1 and 2 promote student thinking and foster more students' formulating answers to more questions.

Research Finding #5: Teachers often accept incorrect answers without probing; they frequently answer their own questions.

Look again at how Well-Meaning responds to students whose answers are incomplete or incorrect. She might say "OK" and redirect the answer to another student. Many of us are reluctant to provide feedback to students who give less than correct answers; even fewer of us are willing to stick with that student—and provide prompts—to help the student complete a response to a question we've asked. It is rare to find a teacher who asks a student to explain his or her answer, give an example, or provide a rationale.

Several studies have confirmed that nearly half of student answers are at a different cognitive level than the teacher question, yet teachers generally accept these answers as sufficient without probing or prompting correct responses. Probing, however, is positively correlated with increased student achievement, as reported by Ornstein (1988) in a review of research about effective questioning practice.

Implication: In classrooms where the norm is that every student is capable of giving complete and correct answers, teachers provide prompts, when necessary, to help students give correct answers. When students give either incomplete or incorrect responses, teachers should seek to understand those answers more completely by gently guiding student thinking with appropriate probes.

Research Finding #6: Students ask very few content-related questions.

Well-Meaning's behavior mirrors that of most classroom teachers. The need to "cover the material" means that we cannot take the time for student questions. They might get us "off track." Indeed, in classrooms where teachers are posing two to three questions per minute, there's hardly a place for student questions anyway.

Many authors have written persuasively about how questions are essential to learning. For example, Neil Postman (1979) writes, "All our knowledge results from questions, which is another way of saying that question-asking is our most important intellectual tool" (p. 140). In a similar vein, Morgan and Saxton (1991) write, "Learning springs from curiosity—the need to know" (p. 18). They have proposed a taxonomy of student engagement, in which the asking of a question about the content demonstrates a higher level of engagement. In their framework, when students are extremely interested and engaged with a topic, they need to think about it, challenge the teacher, challenge their own ideas, and consider different points of view. Only at these higher levels of engagement, they contend, do students ask questions about the content.

Implication: If we teachers believe that student questions are essential to their deep engagement with, and learning of, a particular content, teachers will value student questions, help students learn to formulate good questions, and make time for student questions.

Commitment to Quality Questioning Is a Journey

Most teachers with whom we've worked over the years agree that we know much more about quality questions and questioning than we put into practice. In fact, at the beginning of our sessions on effective questioning, we ask participants to reflect on gaps between research and practice in five key areas and to identify reasons why we don't always follow best practice. (For a summary of responses

from one of our trainings, see pp. 17-18.) Without fail, the following issues emerge as barriers to best practices.

- Content coverage
- Time constraints
- Habit or tradition
- A felt need to maintain "control" of class
- Ease for teacher
- Not wanting to embarrass students

Follow-up discussion about responses to the questions usually leads into a consideration of the culture of contemporary schools. Participants almost always agree that much of what drives individuals in schools today is a felt need to "get through" the overwhelming expectations that others set for them. For teachers, it's the pressure to cover the curriculum, to place checkmarks beside state or district standards or objectives, to prepare students for high-stakes tests. For students, it's pressure to get through the school year, to graduate, to meet parental expectations regarding postsecondary plans. So much gets lost in this press to meet other folks' expectations: the passion for teaching and learning, the excitement and energy needed to move from the routine and mundane to the relevant and important.

How can we move beyond these feelings of bewilderment, helplessness, and stress? By reclaiming our professional right and responsibility to teach all of our students what they need to know—and to teach in a manner that optimizes student engagement and personal responsibility for learning. We believe that a renewed commitment to quality questions and questioning has high potential for enabling and supporting us in this journey. And changing our questioning behaviors *is* a journey, a process that can occur over time when individuals develop the will and the skill—and when they have an appropriate framework and support. The remaining chapters in this book provide a roadmap for individuals and groups who are ready to embark on this exciting journey.

Why Does a Gap Exist Between Research and Practice? Interview Design Questions and Reponses from Practitioners

When we conduct workshops on effective questioning, we often pose five questions that overview the major content of the workshop. We use Interview Design (a technique described in Chapter 3) as a way of actively engaging all workshop participants in answering all questions. The following is a summary of responses from teachers and administrators attending a workshop in Greensburg, Pennsylvania. The responses are typical of those we encounter in workshops throughout the United States. As you read the questions and responses, what common themes emerge? Do you understand better why our classroom practice doesn't always match exemplary research-based practice?

Question 1: Research reports that 75 to 80 percent of the questions posed in both elementary and secondary classrooms are at the *recall* or *memory* level. In your opinion, what are the three or four most important factors contributing to this situation?

- Coverage of content and textbook (time and planning)
- Recall questions are easier to ask (provides more teacher control)
- Schools are driven by curriculum, state standards, and state tests
- Society sees learning as knowing facts
- Tradition. This is the way teachers have been trained; it's "what we know"
- Lack of teacher knowledge and skills
- Easier to assess

Question 2: Research reports that most teachers call on students perceived as high achievers more frequently than they call on low achievers. What do you believe to be the two or three overriding reasons for this teacher behavior?

- Time constraints
- It's easier on the teacher
- Provides reinforcement of what's been taught
- Helps teachers feel successful
- More likely to get a serious (not silly) response
- Don't want to embarrass students who don't know the answers
- Lack of patience

Question 3: Research reports that when teachers ask questions of students, they typically wait one second or less for students to begin their responses. Why do you think teachers allow students so little time to begin their responses? Suggest two or three possible explanations.

- Silence (waiting) is uncomfortable
- Lack of time—there's so much you want to accomplish in a period
- Classroom management; can't allow much "down time"
- Need to keep things moving
- Get caught up in the excitement of the lesson
- Impatient teachers
- May not realize you're not giving wait time
- Need to keep students active and engaged

Question 4: Research reports that teachers frequently give a student the answer to a question that the student does not answer correctly or immediately. Can you suggest two or three reasons why many teachers provide the answer rather than attempt to elicit a correct response from the student?

- Time management—the curriculum is "full;" the lesson is packed
- Administrators expect to hear the answer given immediately after the question
- We're uncomfortable with wait time and silence
- Don't want to embarrass students
- Teachers have an expectation that the correct answer needs to be heard
- Lack of teacher ability to probe
- Depends on student ability level
- Students value teachers' answers more than student answers

Question 5: Research reports that students ask less than five percent of the questions in both elementary and secondary classrooms. Why do students initiate so few questions? Offer three or four hypotheses.

- Time is limited
- Afraid of embarrassment
- Students don't know how or don't feel comfortable asking
- Classrooms are teacher-driven versus student-centered
- Teacher is the authority; their role is to question

Questions for Reflection

Thinking, Learning, and Achievement: How Can Quality Questioning Transform Classrooms?

This tool for self-reflection includes reminders of classroom practices that support effective questioning.

Classroom Design	Questions for Reflection
Use classroom norms to help students understand the role of questions and questioning in their learning.	Does the culture of my classroom support quality questioning? • Have I formulated a set of norms that will support a culture of inquiry and thoughtful dialogue? • Have I presented these norms to my students and provided them opportunities to think about how these norms can support their learning?
Use structures to scaffold new student behaviors.	Are there structures in place to support students as they learn to be more fully engaged in classroom discourse? • Do I use a variety of formats to engage students in the answering of questions? • Have students learned the rules and procedures that accompany these formats? • Do I use visual and auditory signals to facilitate smooth transitions from one format to another?
Align teacher and student roles and responsibilities with new vision for teaching and learning.	Is my classroom student-centered; that is, do I maintain a focus on students, as opposed to content *per se?* • Do I see myself as a facilitator of student learning, rather than a content expert to whom students turn for all knowledge? • Are students responsible for their learning and accountable for constructing their own answers to all questions and for making personal meaning from content? • Do students approach learning as a collaborative endeavor, in which they work together and with the teacher to achieve learning goals?
Students (and teacher) value quality questions and questioning and are aware of "good practice."	To what extent do you and your students possess a shared understanding of what good questions and questioning processes look and sound like? • Do you understand the implications of research on questioning for your classroom? • Have you talked with your students about the value of questions and questioning in their learning—and provided a forum for them to think and talk about this topic? • Have you taught your students rules and procedures associated with quality questioning?

References

Appalachia Educational Laboratory. (1994). *Questioning and Understanding to Improve Learning and Thinking (QUILT): The evaluation results. A proposal to the National Diffusion Network (NDN) documenting the effectiveness of the QUILT professional development program.* (ERIC Document Reproduction Service No. ED403230)

Covey, S. R. (1990). *The seven habits of highly effective people.* New York: Simon & Schuster.

Deal, T., & Peterson, K. (1998). *Shaping school culture.* San Francisco: Jossey-Bass.

Gall, M. (1971). The use of questions in teaching. *Review of Educational Research, 40,* 707-721.

Gall, M. D., Ward, B. A., Berliner, D. C., Cahen, L. S., Winne, P. H., Elashoff, J. D., & Stanton, G. C. (1978). Effects of questioning techniques and recitation on student learning. *American Educational Research Journal, 15,* 175-199.

Gall, M. (1984). Synthesis of research on teachers' questioning. *Educational Leadership, 42*(3), 40-47.

Harmin, M. (1994). *Inspiring active learning: A handbook for teachers.* Alexandria, VA: Association for Supervision and Curriculum Development.

Hunkins, F. P. (1995). *Teaching thinking through effective questioning* (2nd ed.). Boston: Christopher-Gordon Publishers.

Marzano, R. J., Pickering , D. J., & Pollock, J. E. (2001). *Classroom instruction that works: Research-based strategies for increasing student achievement.* Alexandria, VA: Association for Supervision and Curriculum Development.

Morgan, N., & Saxton, J. (1991). *Teaching, questioning, and learning.* London: Routledge.

Ornstein, A. C. (1988, February). Questioning: The essence of good teaching—part II. *NASSP Bulletin.*

Perkins, D. (1992). *Smart schools: From training memories to educating minds.* New York: Free Press.

Postman, N. (1979). *Teaching as a conserving activity.* New York: Dell, Laurel Press.

Redfield, D. L., & Rousseau, E. W. (1981). A meta-analysis of experimental research on teacher questioning behavior. *Review of Educational Research, 51,* 237-245.

Rowe, M. B. (1972, April). *Wait time and rewards as instructional variables: Their influence in language, logic, and fate control.* Paper presented at the National Association for Research in Science Teaching, Chicago, IL. (ERIC Document Reproduction Service No. ED061103)

Rowe, M. B. (1986, January-February). Wait time: Slowing down may be a way of speeding up! *Journal of Teacher Education, 37*(1), 43-50.

Sadker, D., & Sadker, M. (1985). Is the OK classroom OK? *Phi Delta Kappan, 66*(5), 358-361.

Strother, D. B. (1989). Developing thinking skills through questioning. *Phi Delta Kappan, 71*(4), 324-327.

Susskind, E. (1979, Summer). Encouraging teachers to encourage children's curiosity: A pivotal competence. *Journal of Clinical Child Psychology, 8,* 101-106.

Thompson, C. L., & Zeuli, J. S. (1999). The frame and the tapestry: Standards-based reform and professional development. In L. Darling-Hammond & G. Sykes (Eds.), *Teaching as the learning profession: Handbook of policy and practice* (pp. 341-375). New York: Teachers College Press.

Walsh, J. A., & Sattes, B. D. (2003). *Questioning and Understanding to Improve Learning and Thinking: Teacher Manual* (2nd ed.). Charleston, WV: AEL.

Wells, G. (2001). The case for dialogic inquiry. In G. Wells (Ed.), *Action, talk, and text: Learning and teaching through inquiry* (pp. 171-194). New York: Teachers College Press.

Wiggins, G., & McTighe, J. (2000). *Understanding by design.* Alexandria, VA: Association for Supervision and Curriculum Development.

Wilen, W. A., & Clegg, A. A., Jr. (1986, Spring). Effective questions and questioning: A research review. *Theory and Research in Social Education, 14*(2), 153-61.