



Questioning Strategies to Improve Student Thinking and Comprehension

Jill B. Slack, Ph.D.
Southeast Comprehensive Assistance Center
Southwest Educational Development Laboratory

Adapted from: Dantonio, M. (1990). *How can we create thinkers? Questioning strategies that work for teachers.* Bloomington, IN: National Educational Service.

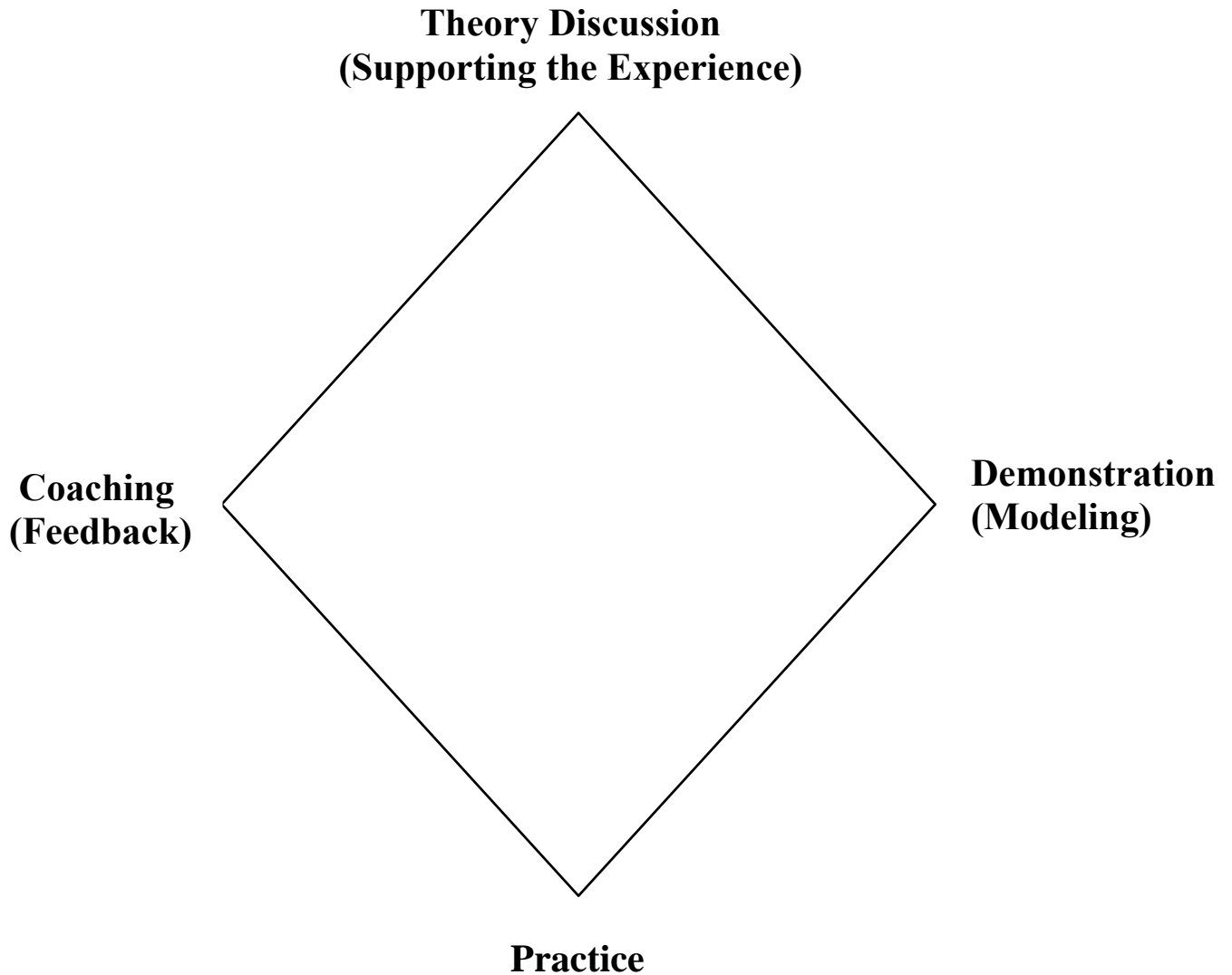
QUESTIONING STRATEGIES TO IMPROVE STUDENT THINKING AND COMPREHENSION

Questioning Strategies to Improve Student Thinking and Comprehension is a design for productive questioning strategies that helps teachers improve their questioning skills. The questioning/learning strategies combine thought questions with questions that assist students in thinking through their responses to develop and refine their thinking abilities as they engage in instructional conversations about reading material. A model of inquiry—the Talent Development Model—is used to help teachers learn and experience the types of questions and combinations of questions that promote and monitor student comprehension, thinking, and learning across all content areas and grade levels.

As a result of the professional development experience, participants will:

1. Develop an understanding of the various questioning processes and thinking skills;
2. Develop an understanding of the nature and function of questions related to reading content;
3. Develop skills in fielding and sequencing questions as well as utilizing student responses;
4. Develop skills in sequencing questions to facilitate student metacognition and higher-order cognitive processing;
5. Develop skills in facilitating classroom discussion of reading material;
6. Develop an awareness of the research in thinking, metacognition, and questioning;
7. Learn to self-assess instructional methods for conducting lessons in thinking skills and cognitive processing; and
8. Adapt the use of questioning processes to accommodate both student diversity and specific content areas.

The Talent Development Model



Adapted from: Joyce, B. R. and Showers, B. (1988). *Student Achievement Through Staff Development*. New York: Longman Press.

Taxonomies and Questioning Systems

Bloom's Taxonomy

Knowledge	Define, recall, recognize, remember
Comprehension	Describe, compare, contrast
Application	Classify, use, choose, solve
Analysis	Identify causes, draw conclusions, determine evidence
Synthesis	Predict, produce, design, develop
Evaluation	Judge, argue, decide, assess

McTighe & Wiggins Six Facets of Understanding

Learner can...	
Explain	Provide thorough, supported, and justifiable accounts of phenomena, facts, and data
Interpret	Tell meaningful stories; offer apt translations; provide reveal historical or personal dimension of ideas and events; make them personal or accessible through images, anecdotes, analogies, and models
Apply	Effectively use and adapt what one knows in diverse contexts
Perspective	See points of view through critical eyes and ears; see the big picture
Empathize	Find value in what others might find odd, alien, or implausible; perceive sensitively on the basis of prior direct experience
Self-Knowledge	Perceive the personal style, prejudices, projections and habits of mind that both shape and impede one's own understanding. One is aware of what one does not understand, of why understanding is hard, and of how one comes to understand

Aschner-Gallagher's Questioning System

Level I	Low Order Convergent (cognitive memory)	Questions requiring students to engage in reproductive thinking
Level II	High Order Convergent	Students engage in the first levels of productive thinking
Level III	Low Order Divergent	Students think critically about information
Level IV	High Order Divergent (evaluative)	Students perform original thinking

Questioning Processes and Thinking Skills

Gathering Questioning Processes

- Observation
- Recall

Sorting Questioning Processes

- Comparing
- Contrasting
- Grouping

Organizing Questioning Processes

- Labeling
- Classifying
- Sequencing

Interpreting Questioning Processes

- Inferring Causes
- Inferring Effects
- Inferring Qualities
- Predicting

Types of Core Questions

Attributes

Effective core questions cue and direct the thought experiences of the classroom discourse. Core questions should be:

Clear: In language that students understand

Focused: Identifies content and thinking skill

Open: Uses words that provide learners with opportunities to state complete responses and allows for diverse responses

Examples

Observation and Recall

(OB) What do you notice/observe about the (content)?

(RL) Tell me what you recall/remember about the (content).

Comparing and Contrasting

(CM) In what ways are _____ and _____ alike?

(CT) What differences do you find between _____ and _____?

(CT) Tell me what discrepancies you noted concerning _____ and _____.

Grouping

Which of the items on the list go together for some reason?

How can we group these items?

Labeling

What are some appropriate names for this idea?

Based on the reasons for the groups, what would be some appropriate names or phrases?

Classifying

Which of the examples belong in the (label) group?

Find or make up an example of the (concept label).

Sequencing

What is the order of the following information based on (criterion)?

Inferring Causes/Effects/Qualities

What are the causes of _____?

What are some effects of _____?

What do you think is true about _____?

Predicting

What do you think will solve/happen as a result of _____?

Types of Processing Questions (Probing Questions)

Refocusing Questions

Needed if learners are not doing the initiated thinking or are talking off the subject.

Clarifying Questions

Need if learners' responses are unclear OR if the teacher feels more appropriate language could be used to express the idea. Also used to help learners define words and bring meaning to their ideas.

Verifying Questions

Provide opportunities for learners to cite or provide evidence for their ideas or information. Learners verify information through/by:

1. Personal experience
2. Stating what authorities say is true
3. Using a principle or a generalization which exemplifies the information

Redirecting Questions

Designed to enhance learner-learner interaction. Use to elicit a variety of responses from different students.

Narrowing the Focus Questions

Used to limit the content learners talk about.

Supporting Questions

Used to help learners "hook up" relationships between and among evidence and statements.

The Questioning Process Map

Core Stems (Examples)

What do you (thinking skill) about (the content)?
Tell me what you (thinking skill) about the (content).

Processing Stems

Clarifying

What do you mean by _____?
Define _____.
What are you referring to when you say _____?
State that in different words.
Draw that for me.

Verifying

Point to that characteristic.
How do you know that?
Give me an example of _____.
When or where have you experienced this before?

Refocusing

What makes you say _____?
You are using another thinking skill, what led you to say _____?

Narrowing the Focus

What do you (thinking skill) about (identify a specific detail)?
Tell me more about (a specific detail).

Redirecting

What else do you (thinking skill) about (specific detail)?
Someone else tell me what you (thinking skill) about the (specific detail).

Supporting

What is the reason for your grouping? (GP)
Why do you think _____ is an appropriate name for your group? (LB)
What is it that makes you say _____ is an example of _____? (CF)
On what basis did you order these? (SQ)
What makes you say _____ caused/is the result of/is the quality of _____? (Inferring CS/EF/QU)
What is the reason for thinking _____ will result in _____? (PR)

Recall and Verification

Verification using the source:

How do you know that is true?
Where did you find that information in the story?
Read that passage.

Verification using authorities:

Who says that?
Name some other authors (or people) using the same idea.

Verification using personal experience:

Where have you experienced this before?
Tell me about a situation you had like the one in the story.

Verification using principles or generalizations:

What rule says this happens over and over again?
What moral do you know that exemplifies this?

The Gathering Processes

Observation

- A thinking skill whereby individuals perceive and collect characteristics about an object, event, or situation through the senses
- Primary way in which we make sense of our experiences
- Situation must be real or representational, not symbolic

Recall

- A thinking skill whereby individuals retrieve specific details derived from their past experiences, written passages, or viewing or listening to media productions
- Learners must comprehend factual information so that it becomes relevant and useful
- Primary or core recall questions must be structured with words that cue recollection (e.g., recall, remember, find out about)

The Sorting Questioning Processes

Comparing

- A thinking skill whereby learners sort information previously observed and/or recalled
- Learners discover similarities among like things, people, situations, etc.
- Similar characteristics often become the distinguishing characteristics for the concepts

Contrasting

- A thinking skill whereby learners sort through information to discover discrepancies between them
- Primary means for distinguishing sub-concepts from major concepts
- Learners must be able to make conditional statements

Grouping

- A thinking skill whereby learners devise the critical characteristics for grouped information or items based on their own discoveries
- Grouping helps learners in developing flexibility in their thinking patterns
- Information can be grouped for attributes of:

- time
- place
- description
- category
- function
- cause-effect relationships

The Organizing Questioning Processes

Labeling

- A thinking skill whereby learners collect their own information, synthesize it, and determine the best name(s) for the attributes of the set of items
- The labels that learners use to describe or name something have more meaning
- Support question is required to elicit the relationship between the characteristics and the label

Classifying

- A thinking skill whereby NEW examples of concepts are placed into known categories
- There are several ways of conducting classifying lessons:
 - Listing examples and non-examples of a concept and asking learners to determine which of the items are examples of the concept
 - Asking learners to generate or find an example of a concept or category
 - Asking learners to change non-examples to examples of the concept or category
- Support type questions are required

Sequencing

- A thinking skill whereby learners arrange information by ordering or ranking it to a given criteria:

serial	time-space
alphabetical	functional
historical	descriptive (size, age, cost, etc.)

- Learners rank or order and provide reasons for the sequence
- Different sequences are appropriate given learners can support their responses

The Interpreting Questioning Processes

Inferring Causes/Effects/Qualities

- A thinking skill whereby learners make hypotheses or educated guesses about objects, events, and/or situations in which all the facts are not present
- Inference of cause relates to reasons for situations or contributing factors
- Inference of effect is the result or consequence of something
- Inference of quality is the assumptions made about the characteristics or attributes of something

Predicting

- A thinking skill related to inferring that asks learners to anticipate outcomes of something and verify and support their thinking
- Predicting involves speculating about future outcomes or anticipating next steps and supporting the conditions and consequences of the expected results or outcomes; consequences are similar to inferring effects
- The condition stem is “What has to be true for _____?” and the consequence stem is “What do you think will result from _____?”
- Support type questions are required for learners to link the conditions and consequences to the stated prediction

Talent Development in Questioning

Teachers work in groups to plan a lesson using the framework provided. A volunteer from each group demonstrates the questioning process in a *brief two- or three-minute rehearsal*. Other teachers act as learners for purposes of the demonstration. As the volunteer teacher demonstrates the lesson, careful attention is given to the following discrete questioning and coding issues:

A. The Core Question

1. Is it clear and open (not prompting yes/no answers)?
2. Does the question have words that cue thinking?
3. Does the question have content focus?
4. Is the response an answer to the core question?
5. Is the response appropriate for the process and content initiated by the core question?

B. The Processing Questions

1. After listening to the response, does the teacher ask additional questions to assist learners in understanding their responses?
2. Are the processing questions open?
3. Does the teacher provide enough wait-time?
4. Does there appear to be an appropriate pattern of question that paces the lesson and extends learner understanding of the process?
5. Does the teacher appear to be listening to the learner response, or is the teacher concerned about the next question?

C. The Coding Process

1. What similarities and differences exist between teacher codings?
2. Are there any patterns, appropriate or inappropriate that exist?
3. What is the impact of the observed patterns on the learners?
4. What patterns need to be maintained or changed to facilitate thinking?
5. In what ways can teachers maintain and/or change existing patterns?

Coding Practice – Predicting (Interpreting)

Transcription of a Teacher’s Questioning Lesson

(After coding the transcription, answer the questions on the previous page.)

Teacher Coding Symbols:

PR	Predicting core question	CL	Clarifying question
<u>PR</u>	Closed predicting core question	VR	Verifying question
1/2	Question lacks process or content	RF	Refocusing question
SP	Support or relationship question	NF	Narrowing the focus
RD	Redirecting question (for more responses)	Tt	Teacher talk

Student Coding Symbols: + On-focus response
 - Off-focus response

T: Now that we have read most of “The True Story of the 3 Little Pigs,” do you think...what do you think will happen next in this story?

S1: It’s like the other three little pigs story we read.

T: Okay, we’ll talk about how these two stories are alike in a few minutes. For now, what do you think will happen next in this story?

S1: The wolf will go crazy.

T: What do you mean “the wolf will go crazy?”

S1: Well, he’ll get really mad and angry like he did with the other pigs and eat him.

T: Oh, I see. Do you really think the wolf will eat the third pig? I mean, someone else tell me what you think will happen next.

S2: I think the third little pig will be okay and the wolf won’t be able to hurt him.

T: What makes you say the third little pig will be okay?

S2: Well, the third pig was smart, so he’ll trick the wolf.

T: Where does it say that in the story...that the third little pig was smart?

S3: Student reads the sentence, “He must have been the brains in the family.”

T: Does someone have another example?

S: No responses.

T: What is an example of a way you think the pig will trick the wolf?

S3: Well, this pig had a brick house, so the wolf won’t be able to blow it down.

S2: Yeah, and if he does, there will be a big mess and the pig will be able to run away.

T: If this is true, do you think the story will have a happy ending?

S: All students respond “yes.”

T: How do you think the story will end?

S1: The wolf will give up and the third pig will live happily ever after.

T: Well, let’s read on and see what happens, and then we’ll compare this story with the first one we read, “The Three Little Pigs.”

Observation Demonstration Lesson Plan (Gathering)

Purpose: Provide learners opportunities to gather the physical properties of a flower through observation

Reason: Prerequisite to reading a story about flowers

Content Characteristics: Petals, stem, color, shape, leaves

Resources: Each student or small group of students has a rose, or a daisy, etc.

(Conduct lesson with one type of flower at a time); paper, pencil, board, diagram

Core Question: What do you notice about the “rose”?

Possible Learner Responses

It’s pretty – RF

It’s not fully bloomed – VR

Lots of petals – CL/VR/RD

The leaves are alternating – CL/VR

My mother grows them – RF

It’s yellow in the middle – CL/VR/NF

The yellow comes off my hands – VR/RD

Processing Stems for Observing

RF (Refocusing response to observing)

What are you noticing that makes you say the rose is pretty?

You’re telling me about your mother’s roses, what do you notice about this rose?

CL (Defining and using additional or more precise language)

What do you mean by lots of?

What are you referring to when you say the leaves are alternating?

Draw the leaves coming one after the other.

VR (Verifying details)

Show me the yellow part.

How do you know it’s not fully bloomed?

NF (Narrowing the focus of the critical characteristics)

Tell me more about the middle part.

What do you notice about the stem?

RD (Attaining more student participation)

Someone else tell me about the petals.

What else do you notice about the stem?

Comparing Demonstration Lesson Plan (Sorting)

Purpose: Provide learners opportunities to compare the attributes of today' space exploration and the fifteenth-century global explorations

Reason: Extends students' understanding of the attributes, relationships, and reasons for peoples' exploration of new worlds

Content Characteristics: Uses of traveling devices and equipment, reasons for exploring, exploration of the unknown, etc.

Resources: Library materials and notes on fifteenth-century explorers and twenty-first century space program, paper, pencil, overhead projector

Core Question: From your reading, what similarities are there between today's exploration of space and the fifteenth-century exploration of the New World?

Possible Learner Responses

They were trying to discover unknown territory – CL/VR/RD

Both traveled in ships – CL/VR

Both were adventurous – CL/VR

The fifteenth-century explorers were traveling for their countries – RF/VR

Processing Stems for Comparing

RF (Refocusing response to comparison core question)

You said that the fifteenth-century explorers traveled for their countries; how is that like today's explorations?

CL (Defining and using additional or more precise language)

What do you mean by adventurous?

What are you referring to when you say unknown territory?

VR (Verifying details)

How do you know both groups of explorers are adventurous?

Where did you find _____ information?

How do you know both groups traveled in the name of their countries?

NF (Narrowing the focus of the critical characteristics)

Tell me more about the technology of the times and how the uses of it are similar.

RD (Attaining more student participation)

Someone else give me information about people's desire to explore the unknown.

What other information have you found regarding the similarities between the two exploration times?

Sequencing Demonstration Lesson Plan (Organizing)

Purpose: Provide learners opportunities to arrange in a continuum the various events of a fairy tale

Reason: Develop understanding of plot sequences in literature as well as other means of ordering story information

Content Characteristics: time, plot line, and importance to the pigs

Resources: List of events recording devices, “The Three Little Pigs” story

Core Question: From what you know about the “The Three Little Pigs,” place the events on the handout (e.g., in the order in which they happened in the story; in the order of importance to the pigs).

Possible Learner Responses

Plot Line

Mom asks pigs to move out

Pigs move out

First one builds a house

The wolf blows it down

Second wolf builds a house

(Reason: That is the way the story is written.)

Most important – least important

Moving out

Building homes

The wolf blowing down house

Cooking the wolf

(Reason: They are more concerned about having to move and don’t know about the wolf until after the move.)

Processing Stems for Sequencing

RF (Refocusing response to sequencing core question)

You are telling me reasons for your sequence. What are the specific items in your continuum?

SP (Citing the reasons for the sequence)

Thinking about the events that you have ordered, what are your reasons for thinking that they belong in this order?

CL (Defining and using additional or more precise language)

What do you mean by “concerned about moving out”?

VR (Verifying details)

How do you know “blowing down the house” came before building the second house? Read that part.

RD (Attaining more student participation)

Who has the same order/another order for different reasons?

Inferring Demonstration Lesson Plan (Interpreting)

Purpose: Provide learners opportunities to infer and support attributes about character development in literature

Reason: Aid in understanding character development and motivation for characters' actions in relationship to other characters and plot development

Content Characteristics: Actions of character, statements by character, what other characters said and thought about the character

Resources: The movie "The Wizard of Oz"

Core Question: From viewing the film "The Wizard of Oz," what do you think is true of his character?

Possible Learner Responses

Character

The Wizard

Qualities

He has good intentions – SP

He procrastinates – CL/VR

He is a fake – CL/SP/RD

He isn't magical – VR/SP

He can make Dorothy go home – RF

Processing Stems for Inferring

RF (Refocusing response to sequencing core question)

You are telling me what happens to Dorothy. What is true of the Wizard in this situation?

SP (Citing reasons for the inference)

What makes you say the Wizard has good intentions?

Why is the Wizard not magical?

On what do you base your response that the Wizard is a fake?

CL (Defining and using additional or more precise language)

What do you mean by "procrastinates"?

What are you referring to when you say he is a fake?

VR (Verifying details)

What events in the movie reveal his procrastination?

How do you know he isn't able to perform magic?

RD (Attaining more student participation)

Someone else give me another quality of the Wizard.

Who else thinks the Wizard is a fake and why?

Try-Out Lesson Plan Form

Purpose:

Reason:

Content Characteristics:

Resources:

Core Question:

Possible Learner Responses:

Processing Stems for (Thinking Skill)

Refocusing (RF):

Supporting (SP):

Clarifying (CL):

Verifying (VR):

Narrowing the Focus: (NF)

Redirecting (RD)

Examples of Curriculum Applications for the Various Thinking Skills

Curriculum Applications for Observing

Sentences: word placement, punctuation, and capitalization
Plants: growth, shape, size, color, etc.
Animals: habitats, fur, shape, size, coloring, etc.
Architecture: line, space, decoration, etc.
People: physical features, situations, events, etc.

Curriculum Applications for Recalling

Recollection of events of field trips
Remembering lines from a play or poem
Retrieving specific details from a story
Recalling situations or experiences
Citing details from a commonly viewed movie

Curriculum Applications for Comparing and Contrasting

Analyzing types of poetry
Discovering relationships in stories
Distinguishing between story elements
Identifying similarities and differences in story plots
Comparing or contrasting characters

Curriculum Applications for Grouping

Story elements
Grammar: nouns, verbs, adverbs, adjectives, conjunctions, etc.
Characters in a story or stories
Organs and systems of the human body
Functions of government/countries

Curriculum Applications for Labeling

Naming types of literature
Naming story elements
Generating names for inventions
Naming characters, songs, animals
Naming grammatical concepts

Curriculum Applications for Classifying

Examples of stories
Examples of main or central ideas
Grammar concepts: examples of nouns, verbs, adjectives, adverbs, etc.
Examples of story outcomes
Examples of types of information

Curriculum Applications for Sequencing

Events by time, ordinal number, historical importance
Plot lines
Lines in a chant
Development of types of literature
Importance of situations, people, issues, etc.

Curriculum Applications for Inferring Causes/Effects/Qualities

Reasons for actions or decisions (causes)
Results of decisions, problems, etc. (effects)
Characterization or impact of attributes (qualities)

Curriculum Applications for Predicting

Discovering problem or conflict
Changes in story events
Story resolution

Annotated Bibliography

Beyer, B. (1997). Improving student thinking: A comprehensive approach, 1/e. New Jersey: Allyn & Bacon.

In this book, Beyer provides instruction in specific teaching skills integrated into subject matter teaching. Features a practical, how-to-do-it emphasis. Full of sample materials, explanations and examples for creating thoughtful questions, thoughtful classroom environments, how to encourage and guide student thinking and provide opportunities to think.

Collins, C. & Mangieri, J. M. (1992). Teaching thinking: An agenda for the 21st century. Philadelphia, PA: Research for Better Schools.

This book provides practical ideas and strategies for the teaching thinking, and the findings from research on teaching thinking in diverse populations.

Dantonio, M. (1990). How can we create thinkers? Questioning strategies that work for teachers. Bloomington, IN: National Educational Service.

This manual demonstrates how to ask questions that prompt students to focus, expand, and support their answers. Includes specific and practical steps for developing a successful questioning skills training program.

Dantonio, M. & Beisenherz, P. (2000). Learning to question, questioning to learn: Developing effective teacher questioning practices. Boston: Allyn & Bacon.

This resource introduces a strategy that develops and refines student conceptual understandings through instructional conversations. Examines the critical issues of productive questioning using vignettes, lesson plans, and transcripts.

Kruse, J. (1988). Classroom activities in thinking skills. Philadelphia, PA: Research for Better Schools.

Kruse presents over 40 tested activities in critical thinking, creative thinking, problem solving and decision making.

Leeds, D. (2000). The 7 powers of questions: Secrets to successful communication in life and at work. New York: Perigee.

This book reveals the seven powers of questions and shows how to use them most effectively to get more out of every professional and personal encounter.

Morgan, N. & Saxton, J. (2001). Asking better questions: Models, techniques and classroom activities for engaging students in learning. Ontario: Pembroke.

This guidebook provides tips for modeling questions, lesson plans that emphasize questioning and engage students in learning, and suggestions for using questions to develop knowledge and generate reflection.

Presseisen, B. J. (1988). At-risk students and thinking. Philadelphia, PA: Research for Better Schools.

This text examines students at risk in America's schools, the need for thinking instruction, and implications for practice; includes chapters by national experts.

Sousa, D. A. (1988). Questioning strategies for effective teaching. Philadelphia, PA: Research for Better Schools.

This videotape focuses on developing thinking skills through effective questioning in the classroom; discusses types of questions, strategies for questioning, and how to utilize student responses.

Sternberg, R. J. & Spear-Swerling, L. C. (1996). Teaching for thinking. Washington, DC: American Psychological Association.

This book addresses questions such as, What is "good thinking"? Which strategies promote thinking to learn as well as learning to think? Can asking the right questions enhance student thinking? How can teachers prepare for the challenges of teaching for thinking? Lively classroom vignettes, sample classroom activities and self-study questions are included.

Additional Resources

Wait-Time Facts and Findings

Researchers on questioning strategies speak of two kinds of wait-time:

- ◆ "wait-time 1" refers to the amount of time the teacher allows to elapse after he/she has posed a question and before a student begins to speak; and
- ◆ "wait-time 2" refers to the amount of time a teacher waits after a student has stopped speaking before saying anything.

The research has focused more on wait-time 1 than wait-time 2, but the following findings apply to both. Findings include:

- ◆ The average wait-time teachers allow after posing a question is one second or less.
- ◆ Students whom teachers perceive as slow or poor learners are given less wait-time than those teachers view as more capable.
- ◆ For lower cognitive questions, a wait-time of three seconds is most positively related to achievement, with less success resulting from shorter or longer wait-times.
- ◆ There seems to be no wait-time threshold for higher cognitive questions; students seem to become more and more engaged and perform better and better the longer the teacher is willing to wait.

Increasing wait-time beyond three seconds is positively related to the following student outcomes:

- ◆ Improvements in the student achievement
- ◆ Improvements in student retention, as measured by delayed tests
- ◆ Increases in the number of higher cognitive responses generated by students
- ◆ Increases in the length of student responses
- ◆ Increases in the number of unsolicited responses
- ◆ Decreases in students' failure to respond
- ◆ Increases in the amount and quality of evidence students offer to support their inferences
- ◆ Increases in contributions by students who do not participate much when wait-time is under three seconds
- ◆ Expansion of the variety of responses offered by students
- ◆ Decreases in student interruptions
- ◆ Increases in student-student interactions
- ◆ Increases in the number of questions posed by students

Increasing wait-time beyond three seconds is positively related to the following teacher outcomes:

- ◆ Increases in flexibility of teacher responses, with teachers listening more and engaging students in more discussions
- ◆ Increases in teacher expectations regarding students usually thought of as slow
- ◆ Expansion of the variety of questions asked by teachers
- ◆ Increases in the number of higher cognitive questions asked by teachers.

Wait-Time References

Brophy, J., and Good, T.L. "Teacher Behavior and Student Achievement." In Handbook of Research on Teaching (3rd ed.), edited by Merlin C. Wittrock. New York: Macmillan Publishing Co., 1985.

Summarizes research on classroom questioning practices that are positively related to student achievement.

Cotton, K. Instructional Reinforcement. Portland, OR: Northwest Regional Educational Laboratory, 1988.

Synthesizes the research on reinforcing students' learning in classroom settings and offers research-based guidelines for providing reinforcement.

Gall, M. "Synthesis of Research on Teachers' Questioning." Educational Leadership 42(1984): 40-47.

Reviews the research on the effects of teachers' questioning techniques and identifies implications of this research for classroom practice.

Henson, MT. "Questioning as a Mode of Instruction." The Clearing House 53(1979): 14-16.

Provides an overview of research findings on teachers' classroom questioning and provides guidelines for framing and asking more productive questions.

Honea, J.M., Jr. "Wait-Time as an Instructional Variable: An Influence on Teacher and Student." The Clearing House 56(1982): 167-170.

Reports the results of an experiment in increasing wait-time to three to five seconds, which significantly improved student engagement and participation.

Kleinman, G.S. "Teachers' Questions and Student Understanding of Science." Journal of Research in Science Teaching 3(1965): 307-317.

Investigates the relationship between teachers' questioning techniques and (1) both teacher and student behavior, and (2) student achievement.

Ornstein, A.C. "Questioning: The Essence of Good Teaching - Part II." NAASP Bulletin 72(1988): 72-80.

Reviews research on questioning techniques and offers research-based "tips" and "pitfalls" to help teachers ask more productive classroom questions.

Sitko, M.C., and Slemon, A.L. "Developing Teachers' Questioning Skills: The Efficacy of Delayed Feedback." Canadian Journal of Education 7(1982): 109-121.

Results of this study on the impact of teacher training in questioning techniques indicated that 1) they were able to ask better questions and 2) the quality of student responses increased.

ASSESSING QUESTIONING SKILLS

This assessment can be used for collecting feedback related to one's questioning skills. It can be used as a self-assessment or as a peer observation tool. An instructor can use the information gathered to identify strengths and weaknesses in his or her questioning techniques.

Directions: Respond to each of the statements below by writing next to the statement the number that most closely corresponds to your observation.

1. = Not Applicable
2. = Needs Improvement
3. = Satisfied
4. = Very Satisfied

Level and Types of Questions

1. Asked questions which were appropriately phrased and understood by students.
2. Asked questions which were at an appropriate level for the materials being covered.
3. Asked questions that required students to think at various intellectual levels.
4. Questions followed a logical sequence.
5. Student responses were used to guide teacher's next question.
6. Questions were consistent with the intended goals or objectives of the lesson.
7. Asked questions which assessed student understanding.
8. Asked processing questions if a student's answer was incomplete or superficial.
9. Encouraged students to answer difficult questions by providing cues or rephrasing.
10. Avoided closed-ended questions.

Attending Behaviors

1. Addressed questions to individual students as well as the group.
2. Called upon students in a friendly non-threatening manner.
3. Paused after all questions to allow students time to think of an answer (wait time).
4. Avoided interrupting students during questions and responses.
5. Handled incorrect or off-focus responses.
6. Checked understanding of unclear student responses (clarifying).
7. Avoided using condescending or put-down tone when responding to student answers.
8. Demonstrated active listening skills (e.g., eye contact, head nodding).
9. Used positive nonverbal cues (e.g., smiling, friendly voice) when students were responding.
10. Built upon or developed ideas suggested by students.

Questioning Strategies Observation Tool

"How do I know if I helped my students to think today?"

A way to identify teaching for thinking in the classroom is to invite a peer to observe for the following teaching behaviors or listen to a recording of one of your lessons. Tally each behavior and note specific examples including the language you use.

Teacher Behavior	Tally	Examples: Language Used
Wait Time 1: Thinking time - 3 or more seconds		
Wait Time 2: Time teacher waits after students stop speaking		
Core Question: Clear, focused, open		
Clarifying: Asking students to explain and qualify their responses		
Verifying/Supporting: Requesting specific and direct evidence/support		
Refocusing: Bringing students back to the subject of discussion		
Narrowing the Focus: Specifying particular content to talk about		
Redirecting: Eliciting more student responses		

Share your examples with your colleagues. These examples are evidence that you are helping your students to think!

NOTES

