

Critical Thinking

Dialoging • Discussion Questions • Taxonomies

Critical Thinking is the art of analyzing and evaluating thinking with a view to improving it.

Critical and creative thinking skills should be the “model” for direct teaching for all ages and abilities, while reading orally, to process language and reading skills.

The teacher must control the amount of questioning, answering, defending and clarifying while calling on other students to respond after the initial student response.

Excessive questioning may result in over application of the process turning students “off”, instead of motivating them.

The teacher must **balance the amount of oral reading** to cover enough text for story content while being cautious to pause at appropriate places to dialog and clarify.

Pauses in reading should always occur when an unknown word is met and a decoding episode begins.

Questioning will reveal academic weaknesses in individuals and as a group.

Specific lessons about reading and language skills can be remediated by direct instruction. Silent reading sessions are the most logical place for seatwork remediation for certain skills, reinforced during oral reading.

Combining thinking skills and comprehension results in a powerful learning environment for students of all ages. To try and relate the specific content in reading and the specifics of critical and creative skills advancing to **Socratic Dialog** requires an understanding of the purposes on the part of the teacher. This effort is a condensed design to introduce both reading skills and critical thinking. Topics may be out of logical sequence at times and must be made clear by the teacher practicing these strategies. The nature of the two processes will be described below, as well as topics as a model and topics for reader’s understanding.

Dialoging critical thinking skills is generally limited by the purpose of the discussion. Students need to be challenged regarding the reading skills and critical thinking questions are the basis for that challenge. Shorter dialoging episodes for basic reading skills and basic language skills result in a greater depth of understanding and knowledge for use than lessons producing only awareness of the skill with a casual explanation when met in text.

Socratic dialog questions contain many of the processing questions found in critical thinking but the intensity and length of the dialoging activity is much greater when answering the focus question.

Critical Thinking has many descriptive definitions and would require more text and classroom discussion not possible at this time.

Background Information - Eight Elements of Thought:

- **Purpose**-goal, objective
- **Question at Issue**-problem, issue
- **Information**-data, facts, observations, experiences
- **Interpretation and Inference**-conclusions, solutions
- **Concepts**-theories, definitions, axioms, laws, principles, models
- **Assumptions**-presupposition, taking for granted
- **Implications and Consequences**
- **Point of View**-frame of reference, perspective, orientation

All “THINKING” is defined by the Eight Elements That Make it Up.

Whenever we think, we think for a purpose within a point of view based on assumptions leading to implications and consequences. We use concepts, ideas and theories to interpret data, facts, and experiences in order to answer questions, solve problems, and resolve issues. **Thinking then:**

- Generates purpose
- Raises questions
- Uses information
- Utilizes concepts
- Makes inferences
- Makes assumptions
- Generates implications
- Embodies a point of view

Analytic Questions Implied by the Elements of Thought

- What is my fundamental purpose?
- What is my fundamental purpose?
- What is the key question I am trying to answer?
- What information do I need to answer my question?
- What is the most basic concept in the question?
- What assumptions am I using in my reasoning?
- What is my point of view with respect to the issue?
- What is my most fundamental inferences or conclusions?
- What are the implications of my reasoning (if I am correct)?

Critical thinking skills movement strives to inculcate a comprehensive set of desired conditions that is the basis of their training and application. The 3 conditions that follow are from the Richard Paul Critical Thinking program at Sonoma as is the 8 elements of thought.

**The Standards
(For all critical thinkers):**

Clarity-Accuracy-Relevance-Logicalness-Breadth-Precision-Significance-Completeness-Fairness-Depth

Must be applied to:

The Elements

**Purposes-Questions-Points of View-
Information-Inferences-Concepts-Implications-Assumptions**

As we learn to develop:

Intellectual Traits

**Intellectual Humility-Intellectual Autonomy-Intellectual Integrity-Intellectual Courage-
Intellectual Perseverance-Confidence in Reason-Intellectual Empathy**

Guilford's Structure of Intellect provides another method of how information is processed. Teachers may use the 5 ways of thinking to develop questions for any subject. The 5 ways of thinking are applied by specific arrangements of how information is organized. The 6 ways information is organized are by:

Units-Classes-Relations-Systems-Transformations-Implications

Cognition-being aware of visual, auditory and tactile responses that may or may not be used for other purposes. It is awareness without a process. This is the method that is used by nearly 95% of classrooms. Without other activities to productively use the information it is soon forgotten.

Convergent Production- is the right answer applied to a closed question. This skill and cognition are called the 'school house' processes.

Memory-There are 18 specific memory skills in the SOI. Lessons must be planned, monitored and reformulated to achieve mastery in any subject.

Divergent Production-often called the creative process it involves changes and elaborations in a figure, idea, language, etc. Anything that is new, unusual or changed from the original is divergent.

Evaluation- is the core of the other 4 processes. This involves the assimilation of information and used to solve problems, predict consequences, and develop a personal process of knowledge.

Each thinking skill may be used to formulate questions and be a guide for critical and creative thinking leading to Socratic episodes.

(Problem-if you are selecting a pilot, bombardier, and navigator for staffing a bomber-what specific thinking abilities should each position require for success?)

To develop a productive questioning strategy, the teacher must ask a question with precise language to initiate student thinking and follow that with a clarification or exploratory question. The first question is a core question to focus on the “thought”. The second is to provide a method of “thought” through dialogue (conversation).

Core questions focus and direct the content and cognitive operation for classroom dialogue.” (Dantonio, 1990)

“Clearly phrased core questions:

1. contain words that are easily understood by learners;
2. are stated simply, without cluttering the question with additional questions , or explanations;
3. focus the student on the content and
4. identify the individual thinking operation students are to use in answering the question.”

Student responses will give clues for follow up questions and on areas requiring specific lessons.

“In a sense, student responses are the windows of learning through which teachers can enter into the students’ minds.”

Wilén (1987) provides 9 suggestions for effective teacher questioning practices. They are:

1. Plan key questions to provide lesson structure and direction.
2. Phrase questions clearly and specifically.
3. Adapt questions to student ability level.
4. Ask questions logically and sequentially.
5. Ask questions at a variety of levels.
6. Follow-up student responses.
7. Give students time to think when responding.
8. Use questions that encourage wide student participation.
9. Encourage students to ask questions.

Teachers should listen carefully to the student response, using it to point the way in asking questions to uncover student thinking.

Process questions help learners think through their original responses so that learners understand the thinking behind what they said.

Processing questions:

“What do you mean by that?”

“How do you know that?”

“What makes you say that?”

“Explain that in a different way.”

“What examples do you have to support your idea?”

“How did you arrive at your understanding?”

Verifying Information

Sample questions for intermediate discussion regarding language and reading skills require verification of the answer by learners and for developing the foundation for Socratic dialoging.

Verification using source:

- Utilizes concepts
- Where did you find that in the story?
- Read that passage.
- How do you know this is true?

Verification using personal experience:

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

Verification using principles or generalizations:

- Is there a moral you know that illustrates this?
- What rule do you recall that says this happens over and over?

Verification using authority:

- Who says that?
- Name some other authors (stories, etc.) using the same idea.

Following stems are samples to probe and explain

Open Question Stems:

- What are?
- In what way.....?
- How.....?
- Why.....?
- What is there about...?
- How do you know....?

Sample core questions; the nouns focus the content under study. The predicate or verb phrases indicate the kind of thinking students are to do in answering the question.

Concepts are found in all reading and the sheer number is staggering. Concept development is a precise teaching strategy with specific procedures found in Taba Teaching Strategies, and Marzano's Concept development, two of several resources for a comprehensive program. This questioning sequence is appropriate for oral reading and drawing the students' attention to a concept that is needed for comprehension of the text.

Core Questions –Developing Concepts

- Observing:** What do you notice about_____?
- Recalling:** What do you remember about_____?
- Comparing:** What similarities are there between_ and __? or, how are they alike?
- Contrasting:** What differences are there between _____and_____?
- Grouping:** In what way do these items go together?
- Labeling:** What can we call?
- Classifying:** How can we classify?

Quality Student Responses

Clarity: The learner answers in understandable English without mumbling, failing to finish, or confusing his/her thoughts.

Accuracy: The learner's answer contains no factual errors and is based on accurate information.

Appropriateness: The learner answers the question that was asked.

Specificity: The learner clearly identifies who and what she/he is talking about.

Support: The learner gives reasons, facts, or examples to support his/her statement, or she or he explains the criteria or assumptions on which she or he bases his/her opinion.

Complexity: The learner's answer shows that she/he is aware that there are many ways of looking at the problem being discussed, and that he/she must consider the options before a valid judgment can be reached.

Originality: The learner draws upon current knowledge and past experiences to create or discover ideas that are new. Use these attributes as a guide for listening to what students have to say.

Note: When initially using the dialog method, the teacher must be lenient in determining the accuracy of answers for less mature learners. When the dialog and oral reading is moving more rapidly, students may give abbreviated answers to a verification question and this is usually satisfactory in early learning stages to maintain a comfortable reading pace.

Refocusing Questions

In using processing questions to probe student thinking and results are acceptable, then dialoging continues. If students are not answering the question, a refocusing question is needed.

The teacher's refocusing questions must restate the student response, tell the student what was not appropriate about the response, and restate the original question.

- You said (___). I asked you to (___). So, (ask original questions again).
- In your answer, you stated (____). I'm not sure how that relates to (____), so let's rethink your answer in relation to this question, (ask the original question again).
- In your answer, you said (____). I'm a little confused about how your answer relates to the question, (ask the original question again).

If student(s) response is still missing the nature of the question, teacher must reformulate a new question asking for the same information by changing the wording in the question.

Clarifying Questions

Using clarifying questions following a student response is an efficient way of building vocabulary. The teacher must make sure that, in answering a clarifying question, students are defining their words rather than giving an example of what they mean.

Examples of clarifying questions are:

- What do you mean by (____)?
- How can you state that in different words?
- How do you define (____) ?
- What would be another word we could use to describe (____)?

Verifying Questions

Verifying questions promote accuracy and originality in student thinking while defining the responsibility for the student to be academic and not flippant.

- How do know (____)?
- What examples can you give for (____)?
- Where did you find that information?
- When or where have you experienced this before?
- Point to (____).
- Who do you know that supports (____)?
- In what way is (____) like (____)?

Verifying or defending answers begins with the teaching of Read Quick's 3 steps and is extremely powerful as a teaching technique to elevate the thinking processes of students regardless of age.

Narrow Focusing Questions

Narrow focus relates to the specificity of the student responses. It asks students to refine their responses for greater depths. If they don't attend to specific content that is a part of the characteristics of a concept the teacher must ask questions to clarify and defend.

There are numerous references dealing with concept development and teachers must become familiar with the strategies and make a conscience effort to include them in their discussion goals.

Supporting Questions

Support deals with identify relationships among information and suspending judgment until all ideas have been considered before making a decision. Suspending judgment is also a strategy in brain storming to elicit many ideas and conclusions about a specific topic or activity. Supporting questions go beyond the “why”, which is too broad, and must identify a more specific boundary.

- What is there about () that makes you say ()?
- How did you determine that () is a/an ()?
- On what basis did you decide that ()?
- In what way does () suggest ()?

Redirecting Questions

The foundation for this process begins when the 3 steps are being taught and the teacher involves other students by asking, “Do you agree? Why or why not? Where can the answer be found on the Combination chart?” Students must be gradually led to respond to each other and learn to answer, defend, and question for preparing for in-depth dialoging.

This questioning method supports the quality, or lack thereof, of student responses for any type of question to continue with the dialog. They should be asked often to elicit a variety of answers, a skill necessary for critical and creative thinking leading to Socratic dialog.

- Who else (ask your question again)?
- What other (ask your question again)?
- What are some other ways we can think about (ask question again)?
- What other information do you have about (ask your question again)?

Blooms Taxonomy

Some teachers may not relate to all of the above thinking strategies and would prefer a more explicit strategy. This taxonomy is easy to follow and apply to oral reading episodes.

KNOWLEDGE

This is the lowest level of the taxonomy and asks you to remember or recall previously learned facts or content. Knowledge level may ask you to define, list, name, or locate something.

Questions like:

- Who is.....?
- What is.....?
- Where are.....?
- When was.....?

Process Words:

Help make questions more precise.

Define-identify-label-list-locate-match-memorize-name-recall-spell-state-tell-underline-fill in the blank

COMPREHENSION

This level requires you to attach meaning to facts and information. Ways to show comprehension are by explaining, describing, or telling something in your own words. Why or how questions are usually asking a comprehension question.

Process Words:

Describe-explain-interpret-put in order-paraphrase-restate-retell in your own words-summarize-trace-translate

APPLICATION

Questions for this level require you to use, apply or transfer what you've learned to other situations. You should demonstrate or show that you actually learned something. Questions with what, where and how are also used for this level.

Process Words:

Apply-compute-conclude-construct-demonstrate-draw-find out- give an example-illustrate-make-operate-show-solve-state a rule or principle-use

ANALYSIS

Analysis and the two higher levels, Synthesis and Evaluation-include a number of higher level thinking processes.

Analysis requires you to examine information by looking at its separate parts. This level builds on the understanding levels of Application and Comprehension and uses facts and information acquired at the Knowledge level.

Analysis questions require you to compare, contrast, or differentiate-this means looking at separate and discrete components or factors. This level also asks that you show how the separate parts are related to each other or to the whole topic being examined.

Process Words:

Analyze-categorize-classify-compare-contrast-debate-determine the factors- diagnose-diagram-differentiate-dissect-distinguish-examine-specify

Higher Level questions using process words:

Analyze principles and factors in Newton's laws which made other laws obsolete.
Contrast the problems of Blacks today with problems they faced in the early 1900's

Specify at least four ways Daniel Boone was able to overcome problems in the wilderness as he developed the trail through the Cumberland Gap. Compare the Civil War with the two conflicts in Iraq. What are the similarities and differences you find?

SYNTHESIS

This is a higher level thinking skill because it asks you to create something unique. It asks you to put together or combine what you have already learned, understood, and analyzed into something new and different. This is divergent thinking as opposed to convergent thinking (Guilford-SOI) because there is more than one acceptable response and the answers given are not always predictable. Divergent thinking branches out from the norm or the usual.

Process Words:

Change-compose-construct-create-design-find an unusual way-formulate-generate-invent-originate-plan-predict-pretend-produce-reconstruct-reorganize-revise-suggest-suppose-visualize-write

Sample Questions:

Predict what space travel will be like in 20 years, 100 years?

Pretend you are an American Indian in the old west and see a train for the first time. How would you feel as you watch the train move on the tracks and hear the loud noises?

Write a sequel to one of your favorite stories.

Rewrite the Bill of Rights to apply to children at school rather than to people in a nation.

EVALUATION

This level requires you to make judgments about the worth, value, or quality of an idea or item. Evaluation asks for your choice or opinion, which you should be able to defend and support (1) on the basis of known standards and evidence, or (2) on the basis of standards, values, or criteria that you develop in order to evaluate, you need to know the facts and understand Knowledge and Comprehension.

Process Words:

Appraise-choose-decide-defend-evaluate-judge-justify-prioritize-rank-select-support-in your opinion

Sample Questions:

Decide who you think had a more difficult trip- Neil Armstrong or Christopher Columbus. Defend your answer.

Evaluate war type aggression as a means of controlling the citizens in another country. Defend your answer.

Want to develop thinking during a dialog or while reading a text and unable to remember a specific question? **Ask true and false questions.**

After the student response, ask, "Tell me what did you find or didn't find in the dialog (or text) that made you believe it was (true or false)?"

"What words led you to think that?"

"Can you find other (words or reasons) that support your answer?"

Continue until the student seems to exhaust his focus and call on another student, "Do you agree or disagree with (____) answer? Why or why not." This procedure is very effective and completely bypasses structured sequences and questions and helps the teacher refine his/hers teaching strategies It all started with "lowly" true-false questions.

Using the 5W's and How or true-false questions, is an excellent lead in at any time and may be used to redirect the nature of the dialog.

Keeping Participants focused on the Elements of Thoughts

1. Did my questions make the goal of the discussion clear?
2. Did I pursue relevant information?
3. Did I question inferences, interpretations, and conclusions where appropriate or significant?
4. Did I focus on key ideas or concepts?
5. Did I note questionable assumptions?
6. Did I question implications and consequences?
7. Did I call attention to the point of view inherent in various answers?
8. Did I keep the central question in focus?
9. Did I call for a clarification of context, when necessary?

Keeping Participants on Systems For Thought

1. Did I distinguish subjective questions from factual questions, from those requiring reasoned judgment within conflicting viewpoints?
2. Did I keep the participants aware of alternative ways to think about the problem?

Keeping Participants Focused on Standards For Thought

1. Did I question for clarification, when necessary?
2. Did I question for more details or greater precision, when necessary?
3. Did I keep participants sensitive to the need to check facts and verify the accuracy of information?
4. Did I keep participants aware of the need to stick to the question on the floor; to make sure their “answers” were relevant to the question being addressed at any given point?
5. Did I keep participants aware of the complexities in the question on the floor? Did I ask participants to think deeply about deep issues?