MODULE INTENSIVE READING

(PBI 221)

MODULE SESION 13

THINKING SKILLS

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Thinking Skills

When children first learn to read, much of their effort is focused on decoding and pronouncing each word correctly. While this kind of phonetic interpretation is essential, in order to become proficient reader students have to be able to understand the meaning of what they read. This not only requires comprehension skills but ultimately good thinking skills.

As students grow into mature readers, their comprehension and thinking skills should also mature. Reading comprehension involves the ability to not only read the lines but also the abstract step of “reading between the lines.” However, the next crucial step involves higher order thinking that takes reading between the lines one step farther. “Good readers” have the ability to read beyond the lines. Higher-order thinking skills enable students to do this and find the real value in the information they are reading.

Students with poor reading comprehension skills lack adequate ability to truly understand the many facets of what they are reading. Processing the information presented in the text is hard for them. They also find it difficult to connect new ideas to previously learned facts and they haven’t learned to implement higher order thinking skills so they can analyze, synthesize, and evaluate new knowledge.

What are higher order thinking skills?

In the 1950s, Benjamin Bloom, an educational psychologist, and his colleagues developed a classification system identifying different levels of cognition that defined both lower and high order thinking. The six levels within the cognitive domain are from lower to higher: knowledge, comprehension, application, analysis, synthesis, and evaluation.

Higher-order thinking is the ability to think beyond rote memorization of facts or knowledge. Rote memory recall is not really thinking. Higher order thinking skills involve actually doing something with the facts that we learn. When students use their higher order thinking skills that means they understand, they can find connections between many facts, they can manipulate them, and put them together in new ways. Most importantly they can apply them to find new solutions to problems.

Students with poor reading comprehension skills may be able to answer concrete questions or recall details. They can usually name characters or places. But they may have a difficult time summarizing information, or comparing one story to another, or using new information to reach new conclusions. Making inferences, identifying the big picture or moral of a story, distinguishing opinions from facts, or finding biases are also skills very difficult – if not impossible – for the reader with poor reading comprehension skills.

One of the goals of reading is to make new connections to our life and world. Readers who can use higher order thinking not only show knowledge and understanding of the text, they can put the information in new contexts and form relations between ideas.

How to strengthen higher order thinking skills for better reading comprehension

Parents can help their students develop higher order thinking skills with a little sit-down time with their child. Review reading material together and ask questions that help make connections and see analogies. Rather than simply asking, “What was the story about?” also ask “How was this story like another you have read?” Encourage the reader to identify problems or dilemmas so they see themselves as problem solvers.

Ask how a situation in the story or text could affect other characters. This will help students develop empathy and understand different viewpoints as well as consequences.

Help students think beyond the story by asking what could have been done differently for a better outcome. This invites creative thinking and problem solving – skills essential in a competitive market place.

Good reading comprehension skills do more than allow students to make sense of what they read. By using higher order thinking skills they can use new information to make help make sense of their world through analysis, synthesis, and evaluation.

Concepts

To understand a group of facts, it is important to understand the conceptual "family" to which this group of facts belongs. A concept is an idea around which a group of ideas revolves — a mental representation of a group of facts or ideas that somehow belong together. Concepts helps us to organize our thinking.

Football, basketball, tennis, swimming, boxing, soccer, or archery all fit the concept of sports. In addition, a person might also group these sports into two more specific concept categories: team sports, such as football, basketball, and soccer; and individual sports, such as tennis, swimming, boxing, and archery.

Concept formation

Concepts can represent objects, activities, or living things. They may also represent properties such as color, texture, and size (for example, blue, smooth, and tiny); things that are abstract (for example, faith, hope, and charity); and relations (for example, brighter than and faster than). Concepts come in a variety of forms, including concrete, abstract, verbal, nonverbal, and process.

- **Concrete or Abstract**

Concrete concepts are those that we can see, touch, hear, taste, or smell. Dogs, chairs, telephones and hamburgers are examples of concrete concepts. Abstract concepts can be used and thought about, but we cannot use our senses to recognize them as we can with concrete concepts. In order to understand abstract concepts, we either have to experience them or compare them to something else we already know. Imagination, friendship, freedom, and jealousy are examples of abstract concepts. Concrete concepts are generally easier to understand than abstract ones because a person can actually see or touch concrete concepts. However, as students move from elementary to middle to high school, they need to be able to grasp more and more abstract concepts. Not only are abstract concepts harder for students to learn, but they are also harder for teachers to teach.

- **Verbal or Nonverbal**

Verbal concepts are those that use language to explain them. Verbal concepts are described by using words, such as love, habitat, and peace. A concept may be both abstract and verbal, such as democracy, or both concrete and verbal, such as tool. Nonverbal concepts are those that lend themselves to being easily understood by being pictured or visualized, such as circle, cup, and evaporation.

Many times both verbal and non-verbal concepts can be used to explain something. While many people prefer one over the other, it is good to think about a concept both by picturing it and by describing it with words.

Constructing both visual and verbal representations yields a more thorough understanding of the concept.

- **Process**

  Process concepts are those that explain how things happen or work. They often include a number of steps that a person must understand in order to master the concept as a whole. Photosynthesis is an example of a process concept in science. The photosynthesis process has certain steps that must take place in a certain order. Math and science courses use process concepts frequently.

Concept connection

When a student is exposed to a new concept, it is important to connect the new concept to concepts he already knows. He can do by classifying, categorizing, recognizing patterns, or chaining. The idea behind each of these connecting processes is to find all the "relatives" of that concept and make a "family tree" for the concept.

A first grader may be learning all about Thanksgiving. A larger concept that Thanksgiving belongs to could be holidays, and a larger concept that holidays belong to is celebrations. Other holidays may include Christmas, Hanukkah, and the Fourth of July. These are all celebrations. Some celebrations, such as weddings, birthdays and funerals, however, are not holidays. The larger concept of celebrations, then, includes celebrations that are holidays and celebrations that are not holidays.

A student needs to practice concept connection. When he is exposed to new information, he should look through his memory for things that seem related to the new information. If a student is discussing what is going on in Kosovo, for example,

he might ask himself what the Civil War, the Holocaust, and Bosnia have in common with Gaza.

Schemas

Bernice McCarthy, a well-known educator, summed it up like this: "Learning is the making of meaning. Meaning is making connections. Connections are the concepts." McCarthy is saying that in order to learn something, we must understand its meaning. We make meaning by connecting new ideas to ones we already have. The links or chains with which we connect new ideas or information to ones we already know are their common concepts.

Schema is a pattern or arrangement of knowledge that a person already has stored in his brain that helps him understand new information. A student may have a definite image in his mind of what a reptile looks like from information he has learned about reptiles from pictures that he has been shown, by what he has read and by what he has been told. When he encounters a creature that he has never seen before, and the creature has all of the qualities that he has stored in his brain about reptiles, then he can infer or draw the conclusion that it probably is a reptile.

Some schemas are also linked to rules and predictable patterns that we have learned. Students can develop schemata for the tests a certain teacher gives, because she always gives the same type of test. This helps a student to know how to study for the test because he knows the kinds of questions the teacher is going to ask. A schema does not always follow a pattern or a rule, however, due to exceptions or irregularities. For example, students may think that they have mastered a spelling or grammar rule only to have the teacher give an exception to the rule. On the whole, however, using a schema or pattern is a way to make helpful predictions.

Metaphors, similes, and analogies

Metaphors, similes and analogies are ways to explain the abstract or unfamiliar by showing how the abstract/unfamiliar phenomena shares characteristics with or compares to a familiar object, idea or concept. Metaphors, similes and analogies may also result in the creation of an image in the mind's eye. The ability to create similes, metaphors and analogies is a greater skill than understanding those created by others. A correctly formed metaphor, simile or analogy indicates that the person understands the subject matter so well that he can make another representation of it. This represents concept connection at higher levels. The capacity to reason using metaphors, similes and analogies is related to the ability to draw inferences from what is read or discussed.

Visualization

Not all thinking is done in words. Sometimes a person may form visual images or pictures in her mind that are equally as meaningful as, or more meaningful than, words. When many of us are asked to give directions to a person, we are able to see a map or visual in our minds that helps us to give these directions. When you read a really good novel, do you visualize what the setting and the characters look like? Are you running your own movie camera? When you are asked the difference between a square and a trapezoid, do you see in your mind what each of these figures looks like? If you can do these things, then you have the ability to use visual imagery. Visualization is especially helpful to students in subjects such as literature, geography, biology, and math.

Inference

To infer is to draw a conclusion — to conclude or surmise from presenting evidence. An inference is the conclusion drawn from a set of facts or circumstances. If a person infers that something has happened, he does not see, hear, feel, smell, or taste the actual event. But from what he knows, it makes sense to think that it has happened. Sometimes inferring is described as "reading between the lines." Authors often give clues that are not directly spelled out. When a reader uses the clues to gain a deeper understanding of what he is reading, he is inferring. Assessments of the ability to make inferences about written text are used to measure reading skill or listening skill.

Inferring is sometimes confused with implying. An author or speaker implies while the reader or listener infers. When we say that written text or a speaker implies something, we mean that something is conveyed or suggested without being stated outright. For example, when the governor said he would not rule out a tax increase, he implied that he might find it necessary to advocate raising some taxes. Inference, on the other hand, is a thought process performed by a reader or listener to draw conclusions. When the governor said he would not rule out a tax increase, the listener or reader may infer that the governor had been given new information since he had until now been in favor of tax reductions.

Problem solving

Not a day goes by that a person doesn't have to solve problems. From the moment a person gets up in the morning and decides what to eat for breakfast, what to wear to work or to school, or how to explain to the teacher why he didn't get his homework done or to his boss why his monthly report isn't finished, he is solving

problems. Problems can affect many aspects of our lives, including social, personal, health, and, of course, school.

Being able to problem solve in school is extremely important. What to write for an essay, how to solve a problem in math, choosing the correct materials for a science experiment, or even deciding who to sit next to at lunch can all be significant problems that a student must solve. How a student goes about solving his problems is important in terms of how successful the results will be. Problems need to be worked through systematically and logically in order to come to a satisfactory conclusion.

When problem solving, it is important to remember the steps needed to be taken. First, the problem needs to be defined and given definite limitations by drawing a mental box around it. Being creative, considering several strategies, and trying out multiple strategies as a means toward reaching the solution is part of being a good problem solver. It is important in problem solving to remember that mistakes are learning opportunities because a person learns what doesn't work. In scientific research, the goal is as often to prove a theory wrong as it is to prove a theory right. Thomas Edison was asked once how he kept from getting discouraged when he had made so many mistakes before he perfected his idea of the light bulb. He had tried over 2,000 ways before one worked. Edison responded that he had not made 2,000 mistakes, but rather that he had over 2,000 learning experiences that moved him closer to the answer.

Idea generation

How often have students heard the teacher say, "Let's hear your ideas about this," or "I need to have some more ideas about how this will work?" Coming up with original ideas is very important in higher order thinking. But what are ideas and where do they come from?

Insights

Some ideas come from insight — a spontaneous cohesion of several thoughts. An insight is like a light bulb turning on in a person's head. Insights are great thoughts that help a person to see or understand something, quite often something that he has not been able to figure out before. For example, a student may be having trouble getting all of his homework done every night. Usually this student leaves his math homework until last because he doesn't like math and math is hard for him. Suddenly, he considers that if he does his hardest subject first, the rest of the homework won't seem so bad, and he might actually finish it all. This student just had an insightful idea about how to solve his homework problem.

Original Ideas

Some ideas are called original ideas. These are thoughts that a person has made up himself and has not copied from someone else. Many teachers look for students who can come up with ideas that no other students have had. To have original ideas, a person has to use his creative imagination.

Brainstorming

One way to generate original ideas or to create a new method of doing things is by brainstorming. Brainstorming can be done individually or in groups, although we usually do this best in groups. It has been said that the best way to have a good idea is to have a lot of ideas. In order to have a lot of ideas, we need to brainstorm. When brainstorming, the goal is to generate as many ideas as possible, regardless of the feasibility of the idea.

If students brainstorm in a group, they can build on each other's ideas. One student's suggestion may give another student a terrific idea that he would not have thought of without the other student's idea. Group members can "hitchhike" on each other's ideas, and modify each other's ideas in order to make new ideas. Becoming good at brainstorming has a practical application to adult life as well as being useful in school. Many new products, such as the iron that turns itself off, were developed by adults through brainstorming.

Critical thinking

Another way to form ideas is to use critical thinking. This involves a person using his own knowledge or point of view to decide what is right or wrong about someone else's ideas. This is sometimes called "having a mind of your own." It means that a person doesn't have to believe or accept everything that someone else says or writes. For example, a friend decides that Babe Ruth is the best baseball player who ever lived. But another friend may feel that Mark McGuire deserves that title, and he may have lots of facts to support his position.

In addition to evaluating other people's ideas, critical thinking can also be used to evaluate things. A person does this when he is deciding which new telephone or book to buy. Of course, critical thinking can sometimes be carried too far. Nobody

likes the person who argues about everything and only feels his point of view is right. If used reasonably, however, critical thinking can help a student be successful in school and elsewhere.

Creativity

Creativity can be measured by its fluency, flexibility, originality, and elaboration. The most creative minds are those for whom creative thought is fluid. The most creative thinkers are also flexible within their creating — they are willing and able to manipulate their thinking to improve upon that which they are creating. Creative thinkers are able to elaborate on their creation, largely because it is their creation and not one that has been borrowed. When creative thinkers are at the peak of their creative process, they may enter a state of concentration so focused that they are totally absorbed in the activity at hand. They may be in effortless control and at the peak of their abilities. Psychologist Mihaly Csikszentmihalyi refers to this fluid and elaborative state of mind as "flow." Finally, creative thinkers are original; they do not "copy" the thinking of others but rather build their thinking from the ground up.

Creativity is usually thought of as divergent thinking — the ability to spin off one's thinking in many directions. But creative thinking is also convergent, for when someone has created something, his thinking may converge only on ideas and information that pertain to that particular invention.

Top Critical Thinking Skills

Analysis

Part of critical thinking is the ability to carefully examine something, whether it is a problem, a set of data, or a text. People with analytical skills can examine information, understand what it means, and properly explain to others the implications of that information.

- Asking Thoughtful Questions
- Data Analysis
- Research
- Interpretation
- Judgment
- Questioning Evidence
- Recognizing Patterns
- Skepticism

Communication

Often, you will need to share your conclusions with your employers or with a group of colleagues. You need to be able to communicate with others to share your ideas effectively. You might also need to engage critical thinking in a group. In this case, you will need to work with others and communicate effectively to figure out solutions to complex problems.

- Active Listening
- Assessment
- Collaboration
- Explanation
- Interpersonal

- Presentation
- Teamwork
- Verbal Communication
- Written Communication

Creativity

Critical thinking often involves creativity and innovation. You might need to spot patterns in the information you are looking at or come up with a solution that no one else has thought of before. All of this involves a creative eye that can take a different approach from all other approaches.

- Flexibility
- Conceptualization
- Curiosity
- Imagination
- Drawing Connections
- Inferring
- Predicting
- Synthesizing
- Vision

Open-Mindedness

To think critically, you need to be able to put aside any assumptions or judgments and merely analyze the information you receive. You need to be objective, evaluating ideas without bias.

- Diversity
- Fairness

- Humility
- Inclusive
- Objectivity
- Observation
- Reflection

Problem Solving

Problem solving is another critical thinking skill that involves analyzing a problem, generating and implementing a solution, and assessing the success of the plan. Employers don't simply want employees who can think about information critically. They also need to be able to come up with practical solutions.

- Attention to Detail
- Clarification
- Decision Making
- Evaluation
- Groundedness
- Identifying Patterns
- Innovation

More Critical Thinking Skills

- Inductive Reasoning
- Deductive Reasoning
- Compliance
- Noticing Outliers
- Adaptability
- Emotional Intelligence

- Brainstorming
- Optimization
- Restructuring
- Integration
- Strategic Planning
- Project Management
- Ongoing Improvement
- Causal Relationships
- Case Analysis
- Diagnostics
- SWOT Analysis
- Business Intelligence
- Quantitative Data Management
- Qualitative Data Management
- Metrics
- Accuracy
- Risk Management
- Statistics
- Scientific Method
- Consumer Behavior

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