

## DOES THINKING GO TO SCHOOL?

### A Partial Summary of our Research and Writing on Thinking

Thinking and how we learn to think intrigues me.

Early on in the growth of our educational agency, I noticed that some students had significant difficulty thinking. When asked to discuss familiar issues such as school, family and hobbies, they failed to provide more than one sentence responses. Others related well to familiar subjects but couldn't relate to abstractions such as government and unions. And these were middle-school students.

## THINKING IS FUNDAMENTAL

I knew that the way students use their minds is seminal to the process of learning. I also noticed that our educational system, despite its multiplicity of testing instruments, did not assess how students think.

That was perplexing. Psychiatrists understand how changes in brain chemistry affect moods and behaviors. Doctors know exactly what happens when a particular part of the brain is damaged by an accident or stroke. Learning disability researchers can diagnose certain verbal and visual deficiencies. Even computer technicians invest millions to develop artificial intelligence that can mimic the brain's power.

Yet, I found almost no comparable body of knowledge in my field regarding the brain and how it relates to learning.

But when academic breakdowns occur, the problem can often be traced to failure in how students think. Read beneath the screaming newspaper headlines about how poorly Illinois students fared on the new state-wide administered ISAT and you will find one reason is that the tests now require students to solve multiple-step "real life" story problems instead of just calculating the answer to isolated problems.

That takes thinking. So what were some of the things that I learned about thinking?

## COMMUNICATION AND THINKING

**Lesson I: Children can't learn to think well if they don't talk.** In my first newsletter I discussed my experience with a sixth grader who couldn't develop a sequence of thoughts about a subject well within her realm of experience: family, friends, and school. I learned that she was a very quiet girl, rarely expressing herself in class. She

had never developed the mental tools, for want of a better word, to organize her thinking regarding a particular subject.

## THE ROLE OF QUESTIONS

How do children develop these mental tools? Remember the preschoolers who drive parents crazy because for every answer they receive they respond with another “why?” At this stage children don’t want an answer they can understand. They are experimenting with language, communication, and interaction, and instinctively they recognize that questions precipitate the process.

Unwittingly, by using questions they are equipping themselves with the mental tools they need when they are ready and willing to attend the answers. Children who don’t ask questions, either through lack of enough communication, brain orientation, or some neurological impairment, find it difficult to develop a sequence of organized thoughts regarding a topic.

## ANALYSIS AND SYNTHESIS

**Lesson II:** Thinking involves two major processes: analysis and synthesis. The Greeks gave us this model for thinking, unsurpassed in the 2000 years that have transpired.

While analysis helps define the familiar, synthesis enables the learner to acquire knowledge of the unfamiliar. New concepts are formed as a learner recognizes how apparently two dissimilar concepts share common qualities. Governing a nation has certain features common with running a household. The storage of files and folders in a computer is not unlike more traditional methods of storing data in file cabinets.

## ANALYSIS A REQUISITE FOR SYNTHESIS

**Lesson III:** Students must be able to analyze familiar concepts in order to synthesize unfamiliar concepts. By sixth grade students should be able to organize their thinking around the six question words---who, what, where, when, how and why. Otherwise, they need training.

<p><b>ACTIVITY:</b> Place a familiar concept on an index card. On six other cards place the six question words. Then ask students to relate everything they know about the familiar word in terms of the question words.</p>
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## SYNTHESIS AS A VEHICLE OF CONCEPT FORMATION

**Lesson IV:** Students use synthesis most effectively when unfamiliar concepts are related to familiar. Examine the teaching style of Jesus, perhaps the greatest teacher of all time, and you will find that he constantly used stories and object lessons to engender synthesis, relating spiritual concepts to farming, bread and water, light and darkness, a Roman coin, and a little child.

For many students, political and social constructs are as abstract as the spiritual concepts that Jesus taught. If you question the validity of this premise, then read on.

### “BORING” MATERIAL

**Lesson IV: Lack of concept formation is a knowledge problem, not a reading problem.**

In helping high school juniors prepare for their college entrance exams, I was often puzzled by a complaint made by any number of students regarding the ACT reading sub test. The word used to describe the passages was “**boring.**”

After working with students over the years I have learned that what most students mean when they say that material is “boring” is that it is incomprehensible. They could read the passage and the questions any number of times and still not find the answer, because they **didn’t understand the concepts underlying the article’s thesis.**

For example, one of the four passages often includes questions regarding politics. Here is an illustration.

According to the passage, one thing that most politicians do not like to think about is:

- A. What the House Committee will do
- B. Doing research about single-issue groups
- C. Running against a powerful well-funded opponent
- D. Whether seniority leadership will kill their legislative work.

Students with any understanding of the political process would recognize that C is the logical answer, without even having to read the passage. But students who do not understand the political process search the whole passage, futilely looking for the answer. But they won’t find it because the answer is implied. No wonder that these students think the material is “boring.”

O.K. Let's review. Communicating, analyzing, synthesizing, and addressing the underlying concepts in a reading passage are crucial. That brings us to the next point.

## **THE NATURE OF CONCEPT FORMATION**

**Lesson V: Don't assume, even in the lower grades, that definition is the same as understanding.** In other words, don't assume that students who can define a term have a clue to its real contextual meaning.

I was helping a fifth grader outline a chapter from his science book on matter. One of the major topics he recorded was the "Properties of Matter." The properties were listed clearly in the text: color, luster, mass, volume and density. All fine and good. But when I asked my student what he thought property meant, he responded by saying, "It's land."

It is conceivable that this fifth grader could learn and define the properties of matter to pass the test, but what impact would this misconception of properties have on the storage of this material in long-term memory? How many similar learning experiences would it take before this student determined that, for the most part, education doesn't relate to what he knows, and the best way to transact his schooling is to continue to define terms that have no global or personal significance?

Wouldn't it be logical to assume that someday this fifth grader would be one of those juniors taking his ACT reading sub test, unable to address the underlying concepts and complaining that the content was "boring?" What is the solution?

An ongoing dialogue with students that enables teachers and parents to probe, assess, and get feedback from students.

Definition without understanding (concept formation) may be humorous when young children are asked questions: we are all familiar with the comic responses made by young children on Art Linkletter-Bill Cosby type shows. But definition without understanding for older students isn't funny; it is tragic. Here is a sample of some student responses to questions relating to the social sciences:

"Socrates died from an overdose of wedlock...History calls people Romans because they never stayed in one place for very long...Rome was invaded by the ball bearings and is full of fallen arches today...Then came the Middle Ages when everyone was middle aged...King Alfred conquered all the Dames."

## THINKING AND READING RATES

**Lesson VI: Reading rate and thinking skills are closely related.** I don't think that the speed reading industry---at one time a multi-million dollar business---recognized the relationship that exists between reading efficiency and thinking.

Power readers are those who can assess an author's main points within the first or second sentence of a given paragraph. Then, either on the printed page or scrolling down a computer screen, their eyes flit through the rest of the paragraph to identify the supporting evidence and details. That's analysis.

Power readers also assess how much they know about the content of the material they are reading and make appropriate adjustments. They recognize that difficult material requires a process of comparing and contrasting unfamiliar with familiar concepts. That's synthesis. And that takes time.

In other words, power readers recognize that aside from previewing a difficult passage to get a global perspective, there is nothing much they can do but to start learning the concepts underlying the unfamiliar material. **In short, they have learned when it is appropriate to read quickly and when it is necessary to do the things that promote the learning of new concepts: using careful investigation, finding other materials written at an easier level, or finding someone who knows more about the topic.**

Can younger students learn to read quickly and effectively? Of course, if their fundamentals are intact and if they deal with material that is well within their range of understanding. That means that initially young students should develop their reading rates using short stories and novels.

## CRITICAL THINKING DOES NOT DEVELOP CONCEPTS

**Lesson VII: Does the current emphasis on critical thinking in the reading of literature passages develop thinking?** Yes and no. Yes, in that the thinking required to identify story outcomes, a character's feelings, and students' projections of their own experiences into the story line demands both analysis and synthesis. No, because it is not specific to **the concepts** that many teachers and parents **assume** students know, but they really don't understand.

This fall a mother related to me that her 5<sup>th</sup> grade daughter is struggling with social studies. Her daughter was asked to recall the names of several explorers who sailed around the coast of Africa. It wasn't just the names and places that were giving her

trouble though. When her mother asked her, she found out that her daughter did not understand what a “coast” was.

**Many kudos to this mother. She knew to ask!**

## **MORE ON THINKING**

Our research has taught us more: How Howard Gardner’s theory of multiple intelligences turned the traditional perception of IQ on its ear, not to speak of how it dispelled the simplistic interpretation of brain power as functions of just the right and left hemispheres. How the proper use of deductive and inductive reasoning processes can revolutionize the way students approach reading. How understanding a student’s daily body rhythms can help improve learning. What Biology has to teach us about how glucose levels maximize brain productivity.

But these issues are peripheral in comparison to the challenge of assessing what our students are internalizing and then finding ways to facilitate the appropriate development of analytical and synthetic thought processes.