Poverty Series—Part II

Building Learning Structures Inside the Head

by Ruby K. Payne, Ph.D.

Hidden Rules of Class

Actual phone conversations:

"Ruby, we got our Texas Assessment of Academic Skills (TAAS) data back. I cried and cried. I don't know what else to do. I did everything I know how to do. What is wrong with me? With my teaching? Maybe I should just quit and do something else."

"I know we are going to get our 'bubble kids' through the TAAS. But as the subpopulation score requirements climb, what are we going to do with the others? Those students that are two and three years behind?"

Teaching is outside the head; learning is inside the head. Every individual has a brain but not everyone has a developed mind. The work of Feuerstein, an Israeli educator who successfully worked for nearly 50 years with students whose mental development was delayed, developed mental prowess through a process of mediation.

Mediation involves three things: pointing out the stimuli (what the individual is to give attention to), giving it meaning, and providing a strategy.

Mediation occurs through language and direct teaching. Mediation builds learning structures in the head, which allow the learner to accept and process the information. A teacher can teach a perfect lesson, but if the student does not have the structures for accepting and using the information, a great deal of the lesson is lost. Through direct instruction, the undeveloped and under-developed parts of the learning structure can be built.

There are four parts of the structure that must be inside a head before a learner can accept the information. To simply represent these four structures, Figure 1 (on page two) will be used.

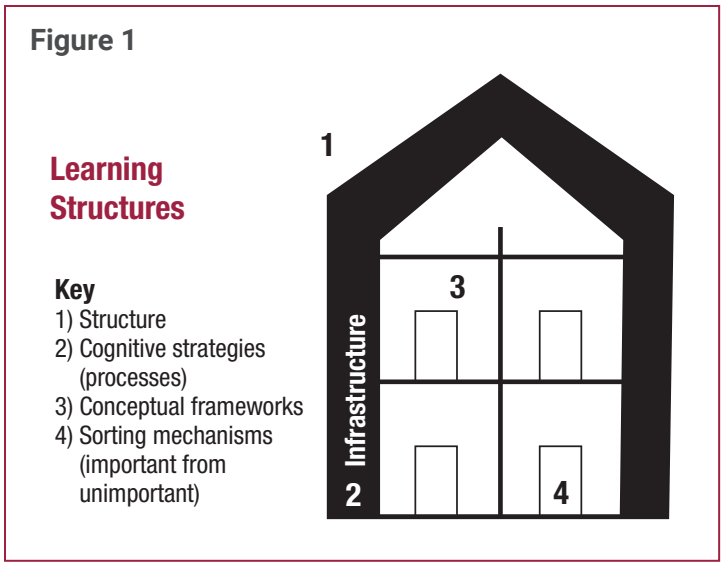
Quite simply, these four structures are 1) a structure for data and a structure for the discipline; 2) cognitive strategies or processes; 3) conceptual frameworks (schema); and 4) sorting mechanisms.

The First Structure

The first structure is an organized mechanism for data. In an analogy to a house, it is the studs and foundation—the very things that hold the structure intact and make it a structure. In an analogy to a computer, it is the hardware itself. It is the organ of the brain that accepts data and structures it. Everything in the universe has structure and is to a certain extent, defined by that structure. The mind is, to some extent, defined by the brain.

In addition, a student needs a structure for each discipline.

Figure 1



Structures in disciplines tend to be underlying principles. For example, the key underlying principle in math is to assign order and value to the universe. In chemistry, the key under lying principle is bonding; in algebra, it is solving for the unknown. When the key underlying principle is under stood, then the whole discipline has a structure or a way to place data.

The Second Structure: Cognitive Strategies

The second learning structure is cognitive strategies. Feuerstein identified several strategies or processes that an individual must successfully have in order to deal with any piece of data. Feuerstein found that students missed much of the original data (up to 50 percent) when the cognitive strategies were not fully or only partially developed.

These strategies are analogous to the infrastructure of a house—the plumbing system, heating system, electrical system, sewage system, etc. In a house, it is when the systems are not working that we realize our reliance upon them. In a computer, these strategies are analogous to the software. Any individual who has worked with a malfunctioning soft ware package knows the importance of this part of the structure.

Feuerstein identified student characteristics when these strategies are missing. The strategies have been restated in the positive, i.e., what students can do when these strategies are present. In the mind, these cognitive strategies are the following:

Input Strategies

Input is defined as the "quantity and quality of the data gathered."

1. Use planning behaviors.
2. Focus perception on a specific stimulus.
3. Control impulsivity.
4. Explore data systematically.
5. Use appropriate and accurate labels.
6. Organize space with stable systems of reference.
7. Orient data in time.
8. Identify constancies across variations.
9. Gather precise and accurate data.
10. Consider two sources of information at once.
11. Organize data (parts of a whole).
12. Visually transport data.

Elaboration Strategies

Elaboration strategies are defined as the "use of the data."

1. Identify and define the problem.
2. Select relevant cues.
3. Compare data.
4. Select appropriate categories of time.
5. Summarize data.
6. Project relationships of data.
7. Use logical data.
8. Test hypothesis.

9. Build inferences.
10. Make a plan using the data.
11. Use appropriate labels.
12. Use data systematically.

Output Strategies

Output is defined as the "communication of the data."

1. Communicate clearly the labels and process.
2. Visually transport data correctly.
3. Use precise and accurate language.
4. Control impulsive behavior.

What do these strategies mean?

Mediation builds these strategies.

When these strategies are not present, they can be built. Typically in school, we begin teaching at the elaboration level, i.e., the use of the data. When students do not understand, we reteach these strategies but do not revisit the quality and quantity of the data gathered.

In order to better understand input strategies, each is explained in more detail. Typically, input strategies are not directly taught, because we do not know to teach them. However, for unmediated students, these strategies must be taught directly.

Implementing the Strategies

Using planning behaviors includes goal setting, identifying the procedures in the task, identifying the parts of the task, assigning time to the task(s), and identifying the quality of the work necessary to complete the task.

Focusing perception on a specific stimulus is the strategy of seeing every detail on the page or in the environment. It is the strategy of identifying **everything noticed by the five senses.**

Controlling impulsivity is the strategy of stopping action until thinking about the task is done. There is a direct correlation with impulsivity control and improved behavior and achievement.

Exploring data systematically means that a strategy is employed to procedurally and systematically go through every piece of data.

Numbering is a way to go systematically through data. Highlighting each piece of data can be another method.

Using appropriate and accurate labels is the use of precise words and vocabulary to identify and explain. If a student does not have specific words to use, then his or her ability to retrieve and use information is severely limited. It is not enough that a student can do a task, he/she must also be able to label the procedures, tasks and processes so that the task can be successfully repeated each time and analyzed at a metacognitive level. Metacognition is the ability to think about one's thinking. To do labels must be attached. Only when labels are attached can the task be evaluated and therefore improved.

Organizing space with stable systems of reference is crucial to success in math. It means that up, down, right, left, across, horizontal, vertical, diagonal, etc. are understood. It means that an individual can identify what the position of an item is with labels. It means that an individual can organize space. For example, if an individual does not have this strategy, then it is virtually impossible to tell a "p", "b" and "d" apart. The only differentiation is the orientation in space.

Orienting data in time is the strategy of assigning abstract values to time and the measurement of time. This strategy is crucial for identifying cause and effect, for determining sequence, and for predicting consequences.

Identifying constancies across variations is the strategy of knowing what always remains the same and what changes. For example, if you do not know what always makes a square a square, you cannot identify constancies. It allows one to define things, to recognize a person or an object, and to compare and contrast. This strategy allows cursive writing to be read with all of its variations. I asked a group of fifth-grade students I was working with this question: "If you saw me tomorrow, what about me would be the same and what would be different?" Many of the students had difficulty with that strategy.

Gathering precise and accurate data is the strategy of using accurate labels, identifying the orientation in time and in space, knowing the constancies, and exploring the data systematically.

Considering two sources of information at once is the strategy of visually transporting data accurately, identifying the constancies and variations, and exploring the data systematically. When that is done, then precise and accurate labels need to be assigned.

Organizing data (parts of a whole) involves exploring data systematically, organizing space, identifying constancies and variations, and labeling the parts and the whole with precise words.

Visually transporting data is when the eye picks up the data, carries it accurately to the brain, examines it for constancies and variations, and labels the parts and whole. If a student cannot visually transport, then he often cannot read, has difficulty with basic identification of anything, and cannot copy.

Elaboration and output strategies tend to be fairly well understood in schools, because that is where the teaching tends to occur. Feuerstein developed well over 100 instruments to use to build these strategies in the brain.

The Third Structure: Conceptual Frameworks

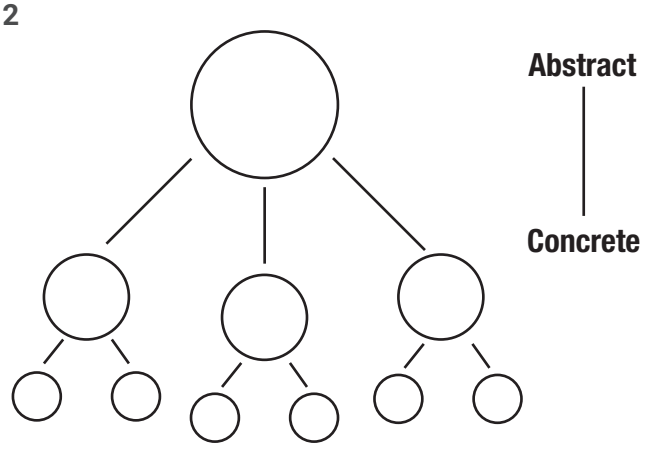
Conceptual frameworks are the part of the structure that stores and retrieves data. In the house, it is analogous to the rooms. In most houses, rooms are identified by function—the bedroom, the living room, the kitchen, the bathroom, etc.

In a computer, the analogy is to the files. In an oversimplification of conceptual frameworks, they might look something like Figure 2.

These frameworks need the general or abstract words so that categories can be made for information, like the files in a computer or the rooms in a house. Development goes from the specific and concrete to the abstract and general.

At least two quick ways are avail able to diagnose the development and accessibility of conceptual frame works. First, if a student gives an example rather than a definition, you know that the concrete part of the framework is available, but the abstract part is not. To store much information, abstract words are necessary to assign and label the

Figure 2



categories. Casual register has very little abstract terminology, so students who do not have access to formal register have difficulty with assigning things to categories.

The second way to diagnose conceptual frameworks is whether a student can ask a question syntactically. For example, the student will ask, "Don't you have any more?" If a student makes a statement but tonally infers it is a question, e.g., "You don't have any more?" then a high probability exists that the student has a low reading comprehension score (Palinscar), and the student is unable to access the stored information with any repeated success. If you have a student who cannot answer the test questions unless they are exactly the same as the review questions, then you have a student who cannot access their conceptual frameworks or "files."

Quite simply, if a student cannot ask questions syntactically, his ability to learn is significantly reduced because he cannot identify what he does not know nor can he systematically access what he does know.

There are several ways to build in conceptual frameworks, but one of the most successful methods is reciprocal teaching by Anne Palinscar.

Another successful method is to make students write their own multiple choice questions using question stems. Vocabulary development is yet another. Tactics for Thinking (Marzano) has several activities that assist in this development.

The Fourth Structure: Models for sorting

Before any data can be stored so that it can be found, some method for sorting the data must exist. Sorting the data simply means identifying what is important and what is not important. Sorting the data is analogous to the door on the room. It is what allows the entrance and exit to the file. On the computer, it is the click of the cursor on the file or the pathway.

Students have difficulty sorting information, particularly nonfiction text, because we do not teach how to sort important from unimportant, except as a summary skill.

Furthermore, if the student uses a random, episodic story structure, memory is often assigned on the basis of what has emotional significance. Because many students do not have a method for sorting information, they try to remember as much as possible, which is very ineffective.

Skilled learners sort text by the organizational pattern or structure of the text. For example, if an article is about the causes and effects of the Civil War, then the reader would sort for causes and effects. If the text compares and contrasts a given topic, then the reader would want to remember what was alike and what was different. We have given students graphic ways to organize their writing, but we have not given them the models to sort text. Basically, the majority of text that students see in schools can be represented by one of five models. Students are simply taught how to identify the five models and sort text with the five models.

In addition, other teaching techniques are available to assist with sorting. Project Read has several good ideas.

Five Models to Use for Sorting

In order to remember, the mind must sort through information and store what is important and discard what is not important. In order to remember the important parts of text, the mind needs to sort against the structure of the text.

We have traditionally used graphic organizers to help students write text. Being able to sort the important from the unimportant during reading is the flip side of that coin. Using models to help students sort text gives them a way to remember organizational pat terns and to identify what is important. The graphic organizers need to be simple so they are easy to remember. The five

Figure 3

Five Models to Use for Sorting

Hand
Topical or descriptive organization

Car
Fiction story structure

Ladder
Narrative
How-to

Cross
Pro/con
Advantages, disadvantages
Cause and effect

Hamburger
Position with proof

symbols in Figure 3 can be used. Any five can be used. Most text that students see in school fits one of these patterns.

How does a teacher use these with students? Give students a piece of text to read and one of the five models. Initially, choose the model that fits the organizational pattern of the text. Put students into pairs. Have them select the most important information and write it into an outline of the model. When finished, use a transparency and help students identify the most important information. Each student should add to his or her written model the information that has been missed.

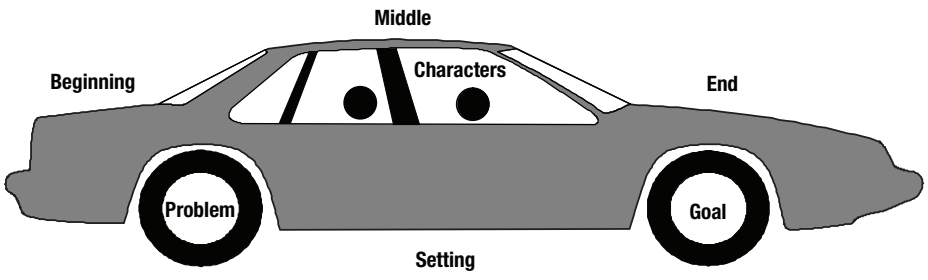
Because the TAAS test has so much nonfiction text, students have difficulty because they want to sort using the fiction story structure (see Figure 4) and so remember the characters, setting and plot. By directly teaching them to sort, students can better select the important information.

Conclusion

The less mediated the student is, the more need the student has for direct instruction in these structures. For several of the reasons I cited in Part 1 of this article, many students from poverty do not have these structures sufficiently in place to do well on the TAAS.

Figure 4

Fiction Story Structure



All that means is that we must provide direct instruction to build these in their minds. It means that we trade out some of the activities we use that do not have a great amount of payoff in achievement for those that have a higher payoff. For example, rather than having students answer questions at the end of the chapter, they can compose questions. When a student

does not have orientation in space, we embed that as a part of the instruction.

Direct instruction to build these strategies is imperative because of the issue of time. Historically, the reason individuals hired teachers or tutors was to provide the learning more efficiently than the individual could with out assistance. Trial and error, as well as experience, can be valuable teachers, but they take more time.

It will be from our interventions with the learning structures that greater strides in student achievement will come. Students who have been traditionally successful in school came to school with learning structures; we built our traditional instructional design around the notion that these would be in place.

But these structures can be built. Someone built them in the minds of students who come to school ready to learn. At school, Feuerstein built them successfully into students who at 12 and 13 years old did not have them. As we reframe our instruction to include their construction, student achievement will increase.

References

Feuerstein, Reuven, et al. (1980). *Instrumental Enrichment: An Intervention Program for Cognitive Modifiability.* Scott, Foresman and Co. Glenview, lL.

ldol, Lorna and Jones, B. F. (1991). *Educational Values and Cognitive Instruction: Implications for Reform.* Lawrence Eribaum Associates. Hillsdale, NJ.

Marzano, Robert J. and Arrendondo, Daisy. (1986). *Tactics for Thinking.* MCREL. Aurora, CO.

Palinscar, A.S. and Brown, A.L. (1984). "The reciprocal teaching of comprehension-fostering and comprehension-monitoring activities." *Cognition and Instruction. 1.*(2), 117–125.

Previously printed in *Instructional Leader* magazine.

Ruby K. Payne, Ph.D., founder and president of aha! Process, lnc. (1994), with more than 30 years experience as a professional educator, has been sharing her insights about the impact of poverty—and how to help educators and other professionals work effectively with individuals from poverty—in more than a thousand workshop settings through North America, Canada, and Australia.

More information regarding her book, *A Framework for Understanding Poverty,* can be found at ahaprocess.com.

www.ahaprocess.com

aha! Process, Inc.
P.O. Box 727
Highlands, Texas 77562

Local: +1 (281) 426-5300
Toll-Free: +1 (800) 424-9484
Fax: +1 (281) 426-8598