

COGNITIVE SKILLS DEVELOPMENT

Teacher Introduction

Determining Your Students' Weaknesses

(Excerpts from article by Dr. Ken Gibson, Founder and CEO of LearningRx)

Do you have students who struggle to understand and learn information you have presented?
Do you have students who wish that they were smarter or wondered why other students do their lessons easier than they do?

Have you ever been puzzled by why some students missed questions on a test even though they studied and thought that they knew the information?

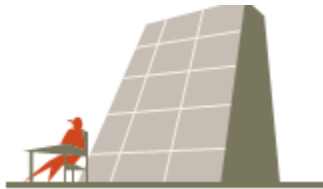
Have you ever drilled students in math facts (e.g. the multiplication table) and it appeared that they had learned the facts but when you review the materials at a later time the students have forgotten information you thought they had mastered?

There are reasons why some children struggle to learn:

- 5% is attributed to one or more sensory defects such as hearing or vision problems.
- 5% can be blamed on low motivation (That's the student's fault 😊)
- 10% is due to poor or inadequate instruction (That's your fault 😊)
- **80% of learning or reading difficulties are the direct consequence of a cognitive skill weakness** (We'll get to this later).

There are basically three options available for overcoming barriers to learning:

1. Accepting



You accept the student's learning limits as permanent, something that can't be helped. Sometimes the student is assigned to special programs that isolate underperforming students. It is a common alternative, and is often justified in the name of preserving the child's self-esteem and making him feel better about his poor academic performance. This is not the best solution.

2. Avoiding



You learn to work around learning weaknesses. Typically it includes changing the learning environment or selecting challenges to fit the students' individual strengths while ignoring their

weaknesses. This may make the student look successful right now but it will lead to future frustration and failure. This is not a complete solution.

Abolishing



The third and best alternative is to do away with the struggles by zeroing in on the source of the problems and dealing with them. If cognitive weakness is the root of your students' learning or reading struggles, then cognitive testing and training is clearly the most promising approach to provide both immediate and long-term answers. It's the only choice specifically designed to help your students overcome learning barriers and unlock their potential.

Just what are cognitive skills, and how do they impact learning?

Cognitive skills are the underlying mental skills required for learning. Cognitive skills are used to process new and recalled information. This information is in your Knowledge Bank. Your Knowledge Bank is where you store and distribute information you have already processed.

The brain is like a bank; instead of putting money into it, you put (deposit) information into it. The more information you deposit into the brain the more knowledge you have. Some information goes into the brain but is not saved. Therefore you cannot use (withdraw) this information. To be able to withdraw the information out of your brain bank account the information must be saved. This is what is meant by learning—storing information that you can use later. Cognitive skills are the processes (activities) in the brain that enable students to learn and build up their brain's information account. If a student has weak cognitive skills he will probably be a poor learner or, at best, a struggling learner. If he has strong cognitive skills he will probably be a good (or effective) learner.

Again, cognitive skills are the mental activities that process new and recalled information. Information is stored in our Knowledge Bank which is where you get the information you have already processed. When a student takes a test, for example, she withdraws the information in her knowledge bank for the answers. That information gets into her Knowledge Bank through several processes that take place in the brain.

There are two categories of mental skills involved in learning:

Active skills—identified as:

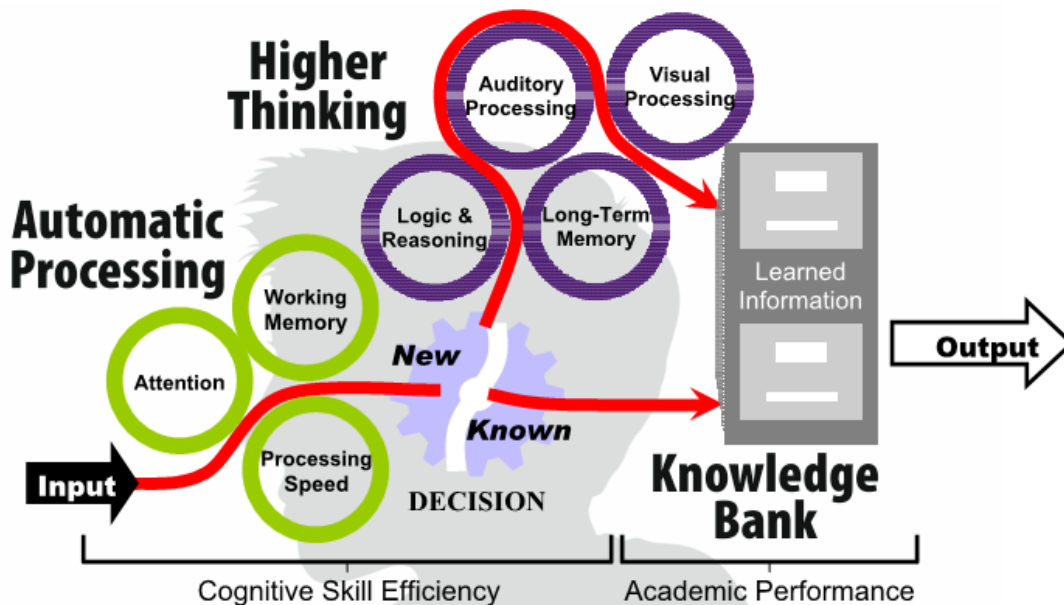
- Attention
- Processing Speed
- Working Memory

These skills listen to (attend to), receive, sort, and prioritize the information you provide as a teachers.

Higher Thinking skills—identified as:

- Auditory Processing
- Visual Processing
- Long-Term Memory
- Logic and Reasoning

Model of Processing New & Known Information



The model above illustrates how the brain deposits and withdraws information.

Exercise 1

Spell your name out loud as fast as you can.... That was pretty easy wasn't it?

To spell your name involved the use of the brain's **Active Processing Skills** (The green circles) which:

- ✓ Are always active and running
- ✓ Automatically handle most information you take in
- ✓ Need to be fast and efficient

Exercise 2

Now spell your mother's name backwards (or if your mother's name is short, pick a name that is hard) as fast as you can.... This was a little more challenging than spelling your name because it involved **Higher Thinking Skills** (the blue circles) which:

- ✓ Is used to process new information
- ✓ Solve a problem that can't be automatically process
- ✓ Are general thinking ability

- ✓ Determine how well information is retained and stored

You were able to do the first exercise (spelling your name) fairly quickly because your active processing skills allowed you to go quickly and easily to your knowledge bank and withdraw that information.

The second exercise (spelling your mother's name backward) was more challenging because you had to use higher thinking skills for that information to get into your **Knowledge Bank** in order for you to withdraw it.

What a student gets out of his **Knowledge Bank** depends on what he puts in to his **Knowledge Bank**. What a student deposits to his Knowledge Bank depends on how well he processes information that you present.

Imagine your students having the mental skills to quickly withdraw information from their **Knowledge Banks** as you did in the first exercise. The **Knowledge Bank** is:

- ✓ Where learned information and data are stored
- ✓ Different from mental processing skills
- ✓ Dependent on mental processing abilities for how much information is in it and how readily available the information is the student to use

The formula for academic success, therefore, is fairly simple:

- You give new information about a subject
- All new or unfamiliar information must be processed before it can be recalled for doing your lessons.
- How well the student does a new mental task (taking a test, answering a question, writing a paper, etc.) depends on the strength and speed of her mental skills (**Active Processing Skills** plus **Higher Thinking Skills**).
- These skills determine the amount of information the student is able to save in and withdraw from his **Knowledge Bank**.

In other words:

How smart the student is = Active Processing Skills + Higher Thinking Skills

These determine what the student knows.

What the student knows = Data stored in their Knowledge Bank.

Is it possible to find clues to determine the relative strength of your students' cognitive skills without testing? Yes, it's possible to judge the strength of a student's cognitive skills by stepping back and observing him in the midst of his daily activities.

In learning and working, each activity requires certain underlying capabilities. To determine strengths and weaknesses you can evaluate all the activities that your students are involved in on a daily basis. Think through the day.

What's easy or hard for the child?

What does he try to avoid?

What is she eager to do?

Those are your first clues about underlying strengths and weaknesses. If the child's underlying cognitive skills are all strong, activities are easy and probably enjoyable. If an underlying skill is weak, an activity will be somewhat troublesome for the child.

It is important to know, however, that there is a serious limitation with this approach in determining a child's cognitive strengths and weaknesses through performance. Doing this observation and activity analysis can take a considerable amount of time. It would require a comprehensive understanding of underlying skills and the role each plays in the child's activities. For example, if a child has difficulty completing a jig-saw puzzle, is it due to inattention, being able to see a piece rotated 90 degrees, or remembering where a piece was last put aside? Unfortunately, although symptoms are helpful they often fail to pinpoint the specific weakness.

Think of it this way. A highly trained and experienced mechanic would not rely solely on symptoms. Sure, if it's a flat tire, no problem, but if it's an engine problem, then what? What you described combined with what the mechanic observes is sometimes not enough for an accurate diagnosis. The car should be taken to the garage and hooked up to special diagnostic equipment for testing to verify his first round diagnosis.

Just as a mechanic uses diagnostic equipment to get an accurate diagnosis, cognitive tests are given to look into underlying mental skills to verify diagnoses made from observations.

Testing cognitive skills is one of the first steps in identifying and correcting weak skills. You can identify what's holding a student back from his learning or working potential by determining the quality of the learning tools he possesses.

Work and academic performance is measured by grades, achievement tests, and production. Cognitive testing can tell you *why* there is a certain level of performance, and help direct the training program to target the most deficient skills. What is weak can be made strong.

Assessment Barriers Removed

A thorough cognitive assessment is a very minimal investment to identify a student's strengths and weaknesses. You'll read more about cognitive assessments later, but right now, it's important to remember that your students' cognitive skills can be identified, and enhanced. Armed with the right knowledge, you can then become the channel for your students' improvement.

What Tests Are Used

There are numerous cognitive test batteries, some designed for the purpose of generating an IQ score and others for determining the quality of specific cognitive skill levels. In the latter category is the highly regarded Woodcock Johnson III Tests of Cognitive Abilities. The Gibson

Test has been designed to provide similar information at a fraction of the cost. The specific skills tested include:

Processing Speed: The efficiency and speed in handling incoming data.

Visual Processing: The proficiency in recognizing and manipulating visual images.

Working Memory: The ease and capacity to hold data in memory input while processing it.

Word Attack: The ability to sound out words, and accurately recognize letter combinations.

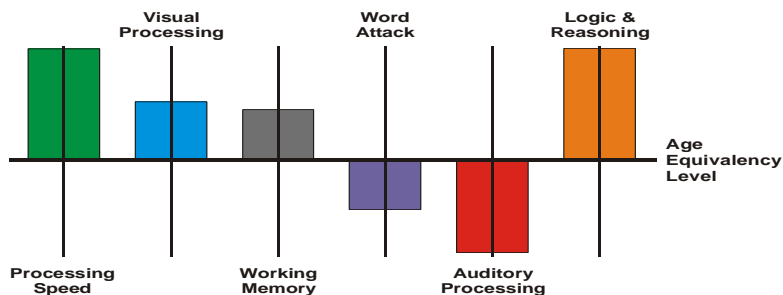
Auditory Processing: The ability to rhyme, delete, substitute and reverse spoken sounds.

Logic and Reasoning: The proficiency of making and recognizing logical connections between data.

Evaluation of Four Common Examples of Test Findings with Case Histories

Many students that are having difficulties with learning fall into one of the four typical categories discussed below. Each category is illustrated with a brief case history of a student, cognitive test results. As you read through these examples, please note the cause and effect relationship between cognitive skills and academic and work performance.

Example 1: A Bright Student but Poor Reader and Speller



DISCUSSION:

Ken is considered bright with an IQ around 140, but he has problems with reading and spelling. Because of some very strong compensation skills he developed in high school, he was able to continue his education and went on to earn a doctorate degree. He wanted to study law, but the writing requirements were too difficult for him so he decided to go into the medical sciences field.

Ken has mixed memory skills. In elementary school, he would study his spelling words five minutes before the spelling test and usually scored one hundred percent. He failed the six-week review tests though because he wasn't able to retain the spelling words in long-term memory. Because of his difficulty with spelling, his writing was grueling and quite laborious. He dropped out of two foreign language courses, and almost every year his lowest grades were in English.

In Ken's school, the students were taught to read by the whole-word method. His memory was above average so he was able to read fairly well the first few years of grade school. It became

apparent in fourth grade though that reading was not easy for him. A student can only retain a certain number of words in visual memory. Because his vocabulary was growing, he could no longer compensate by memorizing the 40,000 – 50,000 words needed for reading comprehension.

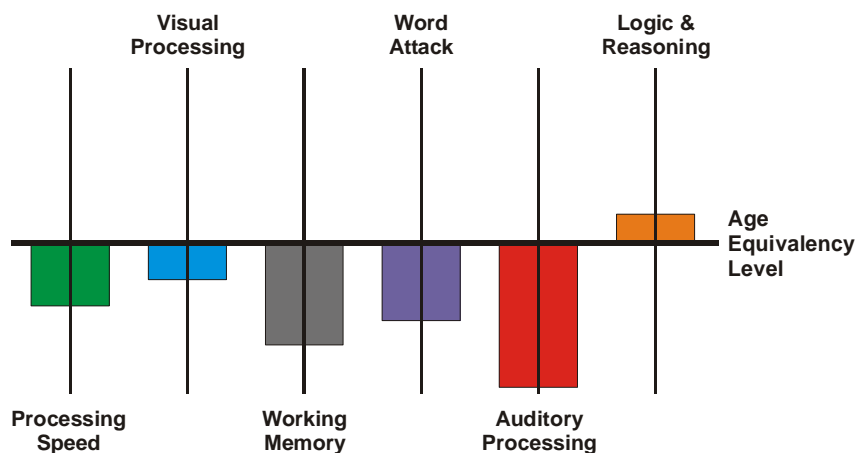
The reason Ken struggled with reading and spelling was because his auditory processing skills were weak. He looked for words within words and considered the content of the sentence to determine unknown words. Also, illustrations helped him in comprehending what he had just read. He did not have the skills needed to sound out unknown words.

If Ken’s teachers had taught Ken utilizing a phonics program, without strengthening his auditory processing skills, he would have still had difficulty in reading and spelling. However, had he received auditory analysis skills training before learning to read, he would have developed his ability to segment and blend sounds and become a good reader.

In graduate school, Ken had difficulty in classes such as bacteriology and pharmacology because the scientific words were long and difficult to remember. Despite being a doctor, in church and small groups, Ken refused to read passages of the Old Testament out loud for fear that he would sound like a fool. In his field he is extremely successful, but he avoided many things he wanted to achieve because of the difficulty he experienced when reading and writing.

In conclusion, strengthening weak auditory processing skills during childhood could have made a major difference in Ken’s life. If evaluated by today’s standards, he would be considered dyslexic. The right option for Ken, auditory processing training, was not available and thus he has struggled with reading, spelling and writing throughout his life. The case history referred to above, are the struggles of yours truly, the author of this article.

Example 2: A Slow Learner



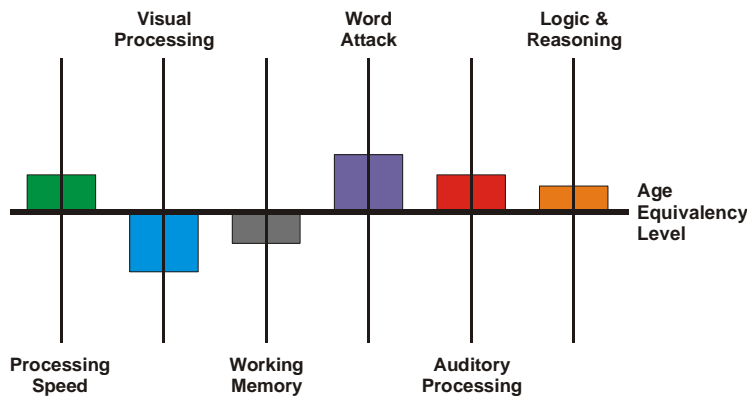
DISCUSSION:

Steve has deficiencies in all areas tested. The deficiencies are apparent in school because all classes are difficult for him. He does not have the skills needed to succeed academically. He does not qualify to receive special services because according to his skill levels (scores shown above) and achievement scores, he is considered to be working at his potential. The teachers consider him as slow and modify his class work so that he can perform at his current skill level.

This does not allow for him to progress in skills so that he can perform at the same level as his classmates.

His weak skills can be improved. It will take longer than average to improve his skills because he is low across the board but improvement *can* be made. If Steve were to enter a mental skills training program followed by an intensive sound-to-code reading program, he would have much better tools to allow for success in the classroom and in life.

Example 3: An Average Learner/Reader with Reduced Comprehension



DISCUSSION:

Andy has difficulty with reading comprehension. He can read fluently and has a great vocabulary but he cannot remember what he has just read. The difficulty with comprehension also affects his math ability. Word problems are especially difficult for Andy.

One of the causes of Andy's difficulties in reading comprehension and math is poor visual imagery. Good reading comprehension requires that reading fluency, memory, visual imagery, and vocabulary are all strong. For Andy, two of those skills are weak which inhibits him from remembering what he just read.

Visual imagery is the ability to create mental pictures in your mind, which allows for better comprehension. Visual pictures aid comprehension because pictures are much easier to remember than if you had to just remember the words you just read. In completing math word

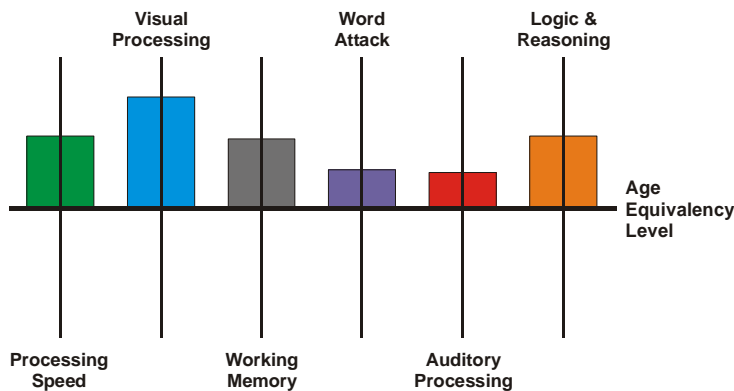
problems, visual imagery is a critical skill. You need to be able to picture the problem so that you know how to take the appropriate steps in finding the solution.

The second cause of Andy's difficulty is working memory. This skill is needed to retain information long enough to process it. For example, when you are asked to do mental math, you need to be able to hold the numbers in your memory long enough to determine the answer and then you can move on to the next problem. When reading, strong working memory skills allow you to make connections that allow for a more complete concept formation.

In looking at his academic performance, teachers would assume he was an *average* student with *average* abilities. It's quite frustrating for Andy because his teachers and parents feel he just needs to try harder, to focus more while reading and doing math.

Looking at Andy's performance in isolation, not looking at the entire picture, the teachers are missing the cause of Andy's difficulties. If Andy were to be involved in cognitive training, his skills would be strengthened so that his reading comprehension and math skills wouldn't be so difficult. In turn, his self-esteem would most likely increase.

Example 4: A Good Learner



DISCUSSION:

Felicia is a student who is considered very bright and does not have any significant problems with learning. Her teachers and parents feel she is doing well in school. Even though her cognitive skills are strong, she could benefit from cognitive skill training.

In a highly academic world, strengthening her skills even more could give her a competitive edge. Learning could be easier and more efficient for Felicia, which could make the difference between attending a state college or an Ivy League University.

Effects of Delays

The clues to a child's learning problems are often not recognized or acted upon until serious damage has been done. The National Center for Learning Disabilities states that at least 44% of

parents who noticed their children exhibiting signs of problems with learning waited a year or more before acknowledging there might be a serious problem.

Often, parents fear that being labeled as learning disabled will have a negative effect on their child's self-esteem. Nearly two-thirds (63%) of parents feel that children with learning disabilities view themselves as different and not as good as other children.

I understand and share your fear. That is why I am glad to tell you that even though you discover the early signs of learning trouble in your child, there is no need or benefit to label them 'learning disabled.' Remember, that label is more useful to the education industry to justify isolating struggling kids than it is in helping the kids. You are reading this article so that you can correct the problem, not label it.

Early detection of learning and reading struggles is critical for recovery. The barriers rise so quickly around students who struggle in the early years of education that they become psychological obstacles. Recovery is more difficult as they get older.

This doesn't mean parents of older students should despair. These kids can be helped successfully in most instances. I would just like to save parents and children the years of frustration by helping them as early as possible.