

THE BRAIN REWIRED

Teaching At Its Best

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Making a Good Brain Great

Dr. Daniel Amen M.D.

Prefrontal Cortex: houses the ability to learn from mistakes, make plans, match our behavior over time to reach our goals; it is the part of the brain that as Jiminy Cricket says “is the still small voice that helps you decide between right and wrong”

Anterior Cingulate Gyrus: helps you feel settled, relaxed and flexible; the brain’s gear shifter; is responsible for cognitive flexibility; shifts attention; cooperation; implicated in “future oriented thinking” such as planning and goal-setting

Deep Limbic System: sets a person’s emotional tone; less active = positive, more hopeful state of mind; provides the filter through which you interpret the events of the day; stores highly charged emotional memories

Basal Ganglia: integrates feelings, thoughts, and movements; sets body’s idle or anxiety level; high basal ganglia is associated with conflict-avoidant behavior; anxiety and physical stress symptoms such as headaches, intestinal problems, and muscle tension

Temporal Lobes: involved with language, reading social cues, short-term memory, getting memories into long-term storage, processing music, tone of voice and mood stability; recognizing objects by sight and naming them; spiritual experience and insight

Cerebellum: involved with processing speed, thought coordination, how quickly cognitive and emotional adjustments are made; motor coordination, posture, poor handwriting, problems organizing, sensitive to light, noise, touch, clothing, being clumsy or accident prone

The best sources of stimulation for the brain are: physical exercise, mental exercise and social bonding

- Put 15 minutes into learning something new every day. Take a class about something new and interesting. Working with modeling clay or Play Doh helps to grow new connections and develops agility and hand-brain coordination
- Limit TV and Video Games
- Read. Reading stimulates the brain areas that help process, understand, analyze, store and remember what was read for later use
- Compare how things work; looking at similarities and differences help the brain’s ability to think abstractly and challenges the frontal lobes
- Physical exercise protects and enhances the brain; stimulates the neurogenesis ability of the brain to generate new neurons; exercise exerts a protective effect on hippocampal neurons that lasts 3 days

The Learning Connection

Steven Shapiro

Visual Processing: the mind's ability to get a visual mental picture
two kinds of visual pictures: images (concrete) and symbols (abstract)
visual pictures of symbols are essential for reading and math
create a vision store house by talking
Name three things you did today that you didn't do yesterday.
Saying, "I don't remember." indicates no ability to get a visual picture.

1. Recall events.
2. Study a picture- take the picture away, describe the picture

VISUALIZING AND VERBALIZING

Lindamood-Bell Institute

WHAT	SOUND	SIZE
MOVEMENT	BACKGROUND	MOOD
PERSPECTIVE	NUMBER	WHEN
WHERE	SHAPE	COLOR

Steven Shapiro. The Learning Connection. Effective Answers to Reading and Learning Difficulties.
Colorado: The Learning Connection. 1997.

Why America's Children Can't Think

Peter Kline

All true learning is language learning.

Language is a means of expressing emotion first and ideas second.

7% words	content
35% voice tone	intellectual tone
58% body language	emotions

What we see when we look at, experience and name something is determined by our expectations and experiences. What we see is a creation of the mind's ability to interpret information from the optic nerves and relate it to remembered experiences to create mental constructs or images.

In order to think, we have to visualize.

MEMORY

THERE CAN BE NO LEARNING WITHOUT MEMORY.

The difference between novices and experts in a field appears to be that experts tend – because of a great deal of experience in a field – to organize information into much larger chunks, while novices work with isolated bits of information.

Benjamin Bloom

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A high proportion of all learning takes place at the **subconscious level**.

EMOTION is the basis on which memory is organized. **Short term memory** is primarily an **electrical activity** and **long term memory** involves a predominantly **chemical process**.

3 R's of Memory

1. registration
2. retention
3. recall

Kinds of Memory

1. procedural
2. episodic
3. semantic

The process of rehearsal involved in subvocalization is critical to transferring information from short to long term memory. Unless an item is rehearsed, it is lost out of the short term memory and does not enter the long term memory. Repetition has little value unless it involves activity. The processing and transfer to long term memory needs adequate time for the encoding and consolidation of the new information into the storage networks. We file information by similarity and retrieve by difference.

Patterns

Are the key to intelligence.

Patterning information really means

Organizing and associating new information with

Previously developed mental hooks.

Your Child's Growing Mind, Jane Healy

Mental patterns are built on networks of sensory connections.

Teach Others/Immediate Use

90%

Learning is experience. Everything else is just information.

Albert Einstein

Cultural Literacy

E.D. Hirsch, Jr.

Literacy

- is the ability to communicate effectively beyond a narrow social sphere and
- is accomplished by everyone knowing the traditional culture; which means teaching traditional myths and facts.

The easiest way of learning something is to associate it with something we already know. Reading and learning both depend on a diversity of prior knowledge. Reading ability depends not only on broad knowledge but also on shared background knowledge.

Knowing a lot of words means knowing a lot of things.

When the schools of a nation fail to adequately transmit the literate national language and culture, the unity and effectiveness of the nation will necessarily decline.

Ernest Gellner

Teaching Vocabulary

Pat Wyman

Directions:

- Determine student's visual memory – When remembering does the students' eyes go up, left or up, right?
- Create vocabulary word cards for each unknown word.
- Choose the first word. Ask: What does this word remind me of? Create a visual image of the answer. Look up the definition. Include the visual image in a picture of the definition.
- Draw the picture in the center of the card.
- Write the meaning of the word in color at the top of the card – up, left for those students whose visual memory is up, left; up, right for those students whose visual memory is up, right.
- Write the word in a different color in the center, at the bottom of the card.
- When all of the cards are complete, hold the card up, left or up, right. Say the meaning of the word first, then the word, aloud, three times.

Talent Is Overrated. What Really Separates World-Class Performers from Everybody Else

Geoff Colvin. New York: Penguin Group 2008

#1 predictor of success: how much one practices

Deliberate practice

- **hard**
- **requires concentration**
- **is exhausting**
- **is designed to improve performance with a teacher's help**
- **builds mental models**
- **requires repetition**
- **provides lots of feedback on results**
- **is continuously available**
- **is highly demanding mentally in learner's learning zone**
- **requires self-regulation; set goals about the process; use metacognition: step outside of self; monitor what's going on and ask how it is going**
- **makes automaticity impossible**

IQ does not measure the ability to engage in cognitively complex forms of multivariate reasoning; critical thinking, social skills, honesty, tolerance, wisdom

Memory ability is created; create a retrieval structure to develop memory

Top performers figure out what's going to happen sooner than the average by seeing more quickly by not what they see; but what they perceive.

~ VAST KNOWLEDGE MATTERS; IN KNOWLEDGE RESIDES POWER ~

Acquisition of domain knowledge takes place during deliberate practice.

Knowledge is the foundation of great performance.

We motivate best through creating a sense of mission.

Intrinsic motivation and creativity go together focusing on the task and not the self.

Sustained, concentrated, effortful study is the core of deliberate practice and high achievement.

Mihaly Csikszentmihalyi
University of Chicago

Brain Speed

a key to learning success

Brain speed

- is how fast the brain processes what is going on, around and within you
- determines attention, alertness, learning, memory, decision making, problem solving, mental clarity
- determines how efficiently the mind works.
- reflects how quickly memories can be recalled, questions answered, problems solved and decisions made.
- the faster your brain processing speed, the more focused you are, the more you take in and learn, the more you remember, the quicker you make sound, split-second decisions and react
- the faster you can mentally recite or rehearse long list of items, the better you remember

Brain speed exercise is the antidote to brain stress.

Joshua Reynolds, Robert Heller, M.D, and Christine Macgenn Rodgerson.
Living Longer Thinking Younger. CA: BriteAge Corp. 2005-2007.

Nutrition

Play games like Jeopardy, Concentration, Memory, Boggle, Scrabble
Work puzzles, crossword puzzles, word searches, Sudoku.

www.freerice.com

Do mental math.

Memorize poems.

Make ABC lists.

Read aloud.

Practice Brain Age games. www.brainfit.com

www.mybraintrainer.com

Speed stack cup stacking eye-hand program www.speedstacks.com

Exercise Brain Gym Infinity Walk Bal-A-Vis-X Learning Breakthrough

Of all the desirable mental skills and capacities – memory, thinking speed, and alertness – nothing is more beneficial than having all of your awareness in the present moment.

Joshua Reynolds Living Longer Thinking Younger 127

**Mental processing speed is much quicker when
the brain is in an alpha state.**

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