Enhancing Academic Skills to Meet University Expectations

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Practicing College Learning Strategies
Houghton Mifflin
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Jenson's Equation for Optimal Leaning

Personal History
(beliefs, experiences, values, knowledge)
+

Present Circumstances
(environment, feelings, people, context, goals, moods)
+
Meaning
(connecting experience, data and stimuli to form conclusions and create patterns that give our lives meaning)
+

Input (5 senses)
(visual, auditory, kinesthetic, olfactory, or gustatory)
+

Processing (learning preference)
(states, left/right hemisphere, abstract or concrete)
+

Responses (7 intelligences)
(verbal-linguistic, spatial, bodily kinesthetic, musical-rhythmic, mathematical-logical, intrapersonal, interpersonal)
=

Optimal Learning

On line http://www.mtsu.edu/~chopper/jensen.html

Eric Jenson. *Super Teaching*. San Diego. The Brain Store, Inc., 1998

Memory Principles

Quick Reference Guide to Brain Compatible Learning Principles

Carolyn Hopper *Practicing College Learning Strategies* 4th ed Houghton Mifflin, 2007

Making and Effort

Interest—The brain prioritizes by meaning, value and relevance. For something to have meaning, you must understand it. In order to remember something thoroughly, you must be interested in it and think that it has value and relevance in your life.

Intent to Remember Your attitude has much to do with whether you remember something or not. A key factor to remembering is having a positive attitude that you *get it right the first time*. Attention is not the same as learning, but little learning takes place without attention.

Basic Background--Your understanding of new materials will depend how much of it can be connected to knowledge you already have. The more you increase your basic knowledge, the easier it is to build new knowledge on this background.

Controlling the Amount and Form

Selectivity--You must determine what is most important and select those parts to begin the process of studying and learning.

Meaningful Organization--You can learn and remember better if you can group ideas into some sort of meaningful categories or groups.

Strengthening Neural Connections

Recitation—Saying ideas aloud in your own words strengthens synaptic connections and gives you immediate feedback. The more feedback you get, the faster and more accurate your learning.

Visualization The brain's quickest and probably the longest-lasting response is to images. By making a mental picture, you use an entirely different part of the brain than you did by reading or listening.

Association--Memory is increased when facts to be learned are consciously associated with something familiar to you. Memory is essentially formed by making neural connections. Begin by asking, "What is this like that I already know and understand?"

Allowing Time to Solidify Pathways

Consolidation--Your brain must have time for new information to establish a neuronal pathway. When you make a list or review your notes right after class, you are using the principle of consolidation.

Distributed Practice--A series of shorter study sessions distributed over several days is preferable to fewer but longer study sessions.

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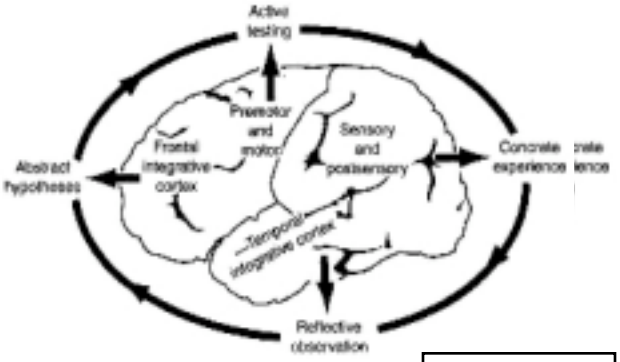
Learning Material Crucial in Your Course



Zull (2002)

List a topic in a course you teach that is
Learning Material Crucial in Your Course

List a topic in a course you teach that is crucial to students' understanding of the course

Topic_____

So often we think of teaching a topic rather than teaching students. This usually means we begin with our own knowledge rather than that of the learner. Prior knowledge is the beginning of new knowledge. It is always where all learners start. They have no choice. Part of the teacher's job is to find ways to combine the established network with new neural networks—to build new concepts using a mix of the old and the new.

Describe several ways to find out what students already know about this topic.

What metaphors, similes, or stories could you use to make the topic concrete for students?

The back cortex gets information in small bits and reassembles it. In terms of the learning cycle, this integration process is reflective. We examine new information. We try to make it personal. We try to determine where it fits in with our experiences and if it has relevance or meaning for us. We look for connections, and as we find these connections we make new ones. All this takes time.

What assignment(s) could you intentionally design to help students reflect--integrate experience of this topic and memory through reflection?

*Data enters the brain through concrete experience where it is organized and rearranged through r**eflection**. But it is still just data until the learner begins to work with it. Understanding is not ownership. When learners convert comprehension into ideas, hypotheses, plans and actions, things are now in their control. They have created and are free to test their own knowledge. Action will then be needed for the learning cycle to be complete. Writing, speaking, or other means can test the newly created knowledge. When this occurs, the learner becomes a producer of knowledge rather than a receiver.*

Describe an assignment that would require your students to develop their own abstract ideas and explanations.

What action will you require of your students to demonstrate ownership of the topic?

Common Cents

Enhancing Academic Skills to Meet University Expectations

OPTIMAL Learning

The art of teaching is the art of assisting discovery." -- Mark Van Doren

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In *How People Learn*, John Bransford points out that the goal of education today is "helping students develop the intellectual tools and learning strategies needed to acquire the knowledge that allows people to think productively about history, science and technology, social phenomena, mathematics and the arts."

- Discoveries in Neuroscience are overlapping with fields of anthropology, philosophy, linguistics, psychology
- Beginning to generate new theories
- If some of these theories are even remotely correct, they will change the was we think about ourselves and how we learn forever

FYE presentation focus

Students

- One of the aspects of a first year experience course should be making sure our students have the tools and strategies to be academically successful.
- To make sure our students know *How to Learn.*

Instructors

- It is important that we as instructors and those instructors we are train employ strategies in the classroom that promote learning.

Enhancing Academic Skills

GOAL

- Develop a simplistic knowledge of what's going on in your brain and that of your students to provide a *framework* for using brain compatible learning.
- Discover some practical applications from brain research that you can use to teach your students to learn how to learn.
- Personalize some practical strategies using brain research to plan curriculum, classroom activities, and assessment for topics that are crucial for your students to learn in your course.

- Every brain is different
- No brain is perfect
- It is our responsibility to learn about ourselves and what gives us each a unique way of seeing the world
- Neuroscientists cannot tell us how to teach.We need to know enough to interpret.

Some Brain Facts

To Provide a Framework

- Stimulus enters the brain through senses
- Promptly processed by a electrical chemical reactions in a complex network of neurons.
- More than 100 billion brain cells called neurons
- Connections more important than number

Neurons

Dendrites-thousands short projections

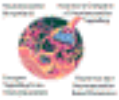
- Nucleus directs activity inside cell (electrical)
- Axon sends messages to other cells (chemical)
- Dendrites receives messages from other cells (chemical)

Single axon splits into branches.

Neurotransmission

The transfer of a message from axon of one cell to the dendrite of another

- Many connector points in both axon and dendrite so neuron receives and sends many messages at a time.
- No contact made between from axons to dendrites
- Communication through release of chemical substances into the SPACES between the axon and dendrites
- This space is known as the SYNAPSE



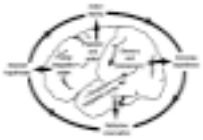
Synaptic connections

- Subject of much of current brain research
  - Most learning and development occurs through the process of strengthening or weakening of these connections
  - Each of of hundred billion neurons may have 10,000 synaptic connections to other neurons
  - Theoretical number of connections possible in a single brain is forty quadrillion.

Neurotransmitters

- Carry information across synaptic clefts
  - 53 known to date
- Learning depends on the **strength of the connection combined with the neurotransmitters**
- Brain changes its connective patterns every second in response to everything we perceive, think, or do.

- Learning originates in concrete experience.
- Learning **depends** on experience, but also **requires** ***reflection***, ***developing abstractions***, and ***actively testing abstractions***.



James Zull. *The Art of Changing the Brain*

Not like personal computer

–More like an ecosystem

- Composed of maps-- arrays of neurons that apparently represent objects of perception or cognition
  - **color, texture, credibility or speed**
- **Most cognitive functions involve the interaction of maps from many different parts at once**

- The brain ***assembles perceptions*** by simultaneous interaction of **whole concepts**, **whole images**
- Rather that logic of microchip, the brain is and **analog processor**
- Works through **analogy** and **metaphor**
- Relates **whole concepts** to one another
- Looks for **similarities** and **differences** or **relationships** between them

Brain-based or **brain compatible** learning is based on how research in neuroscience suggests our brain naturally learns best.

We **empower** students when they understand **how the memory works** or ***How to Learn***

They have the tools to improve their job performance, school achievement, and personal success

Equation for Optimal Learning

- **Meaning**
  - (connecting experience, data and stimuli to form conclusions and create patterns that give our lives meaning)
- **Personal History**
  - (beliefs, experiences, values, knowledge)
- **Present Circumstances**
  - (environment, feelings, people, context, goals, moods)

- **Input (5 senses)**
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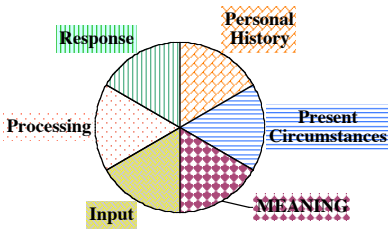
Jenson

Optimal Learning



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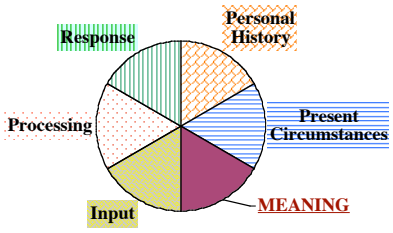

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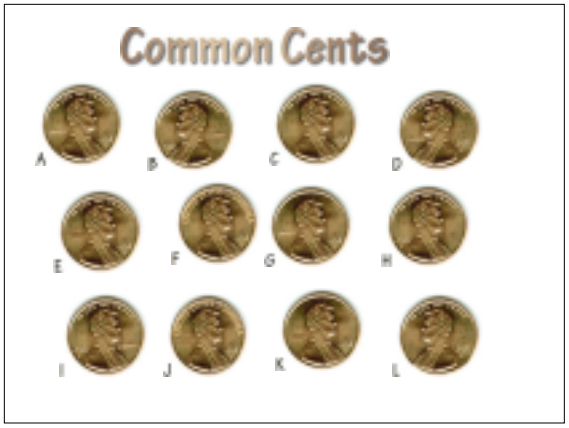
Brain Byte Interest

- Prioritizes by value, meaning, and usefulness
- Brain poorly designed for textbook memory
  - Semantic memory(academic and profession knowledge) ideas facts, typical exam questions,etc
  - Weakest of retrieval systems
- Need to find ways to make information relevant

Common cents



Students

Must Come Up With Ways to Get Interested

- Find a Study Partner
- Get to Know the Professor
- Do Extra Practice or Research
- Teach an Assignment to Someone
- Seek Ways to Make Personal
- Ask Questions
- What is this like that I already know
- How can I make this concrete?

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Thinking and learning is driven by QUESTIONS.

- Define tasks
- Express problems
- Delineate issues
- Making Connections
- Create Hypotheses

Only students who have questions are really thinking and learning.

Instructors

Do We Make the Effort to Make It Interesting?

- What Made You Interested?
- Do You Get to Know Your Students?
- Do You Help the Class Bond?
- Are You Appealing to All Learning Styles?
- Are You Giving the Big Picture?
- Are You Giving Reasons for Studying the Subject?
- Are You Defining Tasks?
- Are You Giving Students Direction in What They Are Looking For?
- Teaching Students to Ask Questions?

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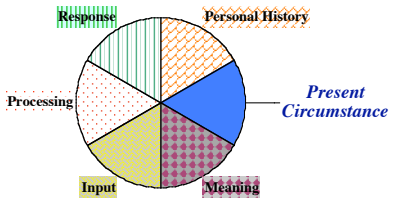
Instructors

- Do you find out what students know before you begin ?
- Do you use concrete examples-- metaphor, similes or stories to help students make connections?

Optimal Learning



Intent to Remember

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Brain Byte
Intent to Remember

- Learning is different from attention. But if we are not attending, we aren't learning.
- If the information does not get enough attention or if is "not deemed necessary for long term memory, it will be encoded in short term memory only and ultimately discarded and reclassified.
- Brain needs to make sense of information

Brain Byte
Intent to Remember

Positive attitude can change the brain in at least three ways:

- It alters the chemistry of the brain with the production of *dopamine*, encourages goal-centered state of mind
- It increases the *noradrenaline* which provides physical energy--provides outward-looking ,vigilant state
- Constructive thinking activates the *frontal lobes* which are most responsible for long-term planning and judgment

Asking questions promotes positive attitude as well as critical thinking

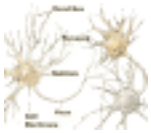
Unfortunately, most student ask few thought-stimulating questions.

They tend to stick to dead questions like

"Is this going to be on the test?"

Getting it Right the First Time

- Physically begins the growth of connections in dendrites and axons
- Creating new connections
- And strengthening existing connections



Getting It Right the First Time

Students

- Taking Notes
- Asking Questions
- Predicting Test Questions
- Providing Context
- Making Sure You Understand
- $20 bill

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Instructors

Are Our Classes Structured to Encourage Intent to Remember?

- Brain Is Poorly Designed for Lecture.
- Learning Is Visual, Auditory, Kinesthetic, Conscious and Non-conscious
- Brain Is Rarely Over Stimulated in Class
- Brain Learns Best on Many Pathways at Once
- Maximum Focus Time for Adults 20-25 Minutes

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Instructors

- Do we prime *brain focus* by stating the goal and objectives of an activity?
- Do we stop and make students responsible for what goes on?
- Do we design classroom activities to give students some control?
  - Active participation?
  - Asking questions

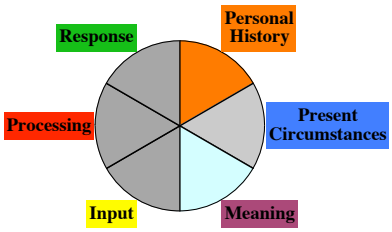
- Learning depends on experience, but requires reflection, developing abstractions, and actively testing abstractions.

15 Minute Deal

Activity
15 Minute Deal

- In your classroom you have just talked about Interest and Intent to Remember.
- *Your group needs to devise several quick ways to determine if students understood.*

Optimal Learning



Basic Background

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Brain Byte
Basic Background

- The knowledge in our minds consists of neuronal networks in our brains, so if knowledge is to grow, the neuronal networks must physically change.
- The *more learning*, the *more connections* you make.
- The greater the number of connections in the brain, the greater the meaning derived from learning.

Brain Byte
Intent to Remember

- When we experience something new, the brain looks for an existing network into which the information will fit.(finding fit adds meaning)
- If there is not a neural network for something, it simple doesn't exist in our brain.
- This is why totally new concepts are so difficult to grasp at first.
- When you activate what you already know about a subject before learning something new, the brain actually makes more connections.

Prior Knowledge

- Is fact
- Is persistent
- Doesn't vanish with marks on paper
- Is the beginning of new knowledge
- Where learners start
- They have no choice

Students

Build as Much Background as You Can

- Before Reading an Assignment, Preview It
  - Survey Title and Headings.
  - Study the Pictures and Charts
  - Read the Summary
  - Familiarize Yourself With Study Questions
- Try to Recall What You Already Know
- Look for Patterns
- Formulate Questions

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Students

Building Background

- Read Assignments BEFORE Going to Class
- Do All Homework Assignment and Readings
- Begin With Basic Level Courses
- Do Extra Research
- Explore the Internet
- Create Ways to Experience the Subject

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As teachers we cannot remove neural networks from students' brains.

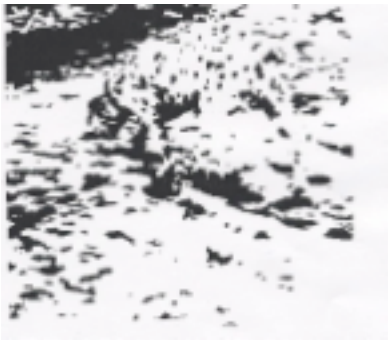
- They are a physical fact.
- Neuronal networks in student brains are related to their own life experiences.
- We must find ways to build on existing neuronal networks.

The Only Way We Learn

is by

MAKING CONNECTIONS

- One of the problems in teaching something to another person is we see connections that the other person does not see yet.
- Telling them what the connections are seldom works; the students need to make that connection for themselves.



Instructors

Are We Aware of Student's Background Experience and Knowledge?

- Do we try to find out what our students know and don't know?
- Do we help student find patterns and make connections to their experience?
- Do we help students find meaning to what we teach?
- Do we give students opportunities to experience the subject?
- Do we help students find ways to build basic background?
- Are concepts and broad principles developed from specific examples?

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Follow up framework

Applying Brain Research to a Topic You Teach

Choose a topic in a course you teach that is crucial to student's understanding of the course.

Topic_____

- We teach **STUDENTS** not **TOPICS.**
- Begin with **student's knowledge** rather that our own.

PART OF OUR JOB

- To find ways to combine the established network with new neural networks.

- Build new concepts using mix of the old and new.

Football illustration

Football

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

- Describe several ways to find out what students already know about this topic.

Data enters the brain through *concrete experience*

- What **metaphors**, **similes**, or **stories** could you use to make the topic concrete?

Zull

- Reassemble
- Integrate
- Examine
- Look for Relevance and Meaning
- Search for Connections
- Make New Ones

Reflection/Integration

- What assignments could you intentionally design to help student reflect--integrate experience of this topic?

Data is just data until the learner begins to work with it

- Understanding is not ownership.
- When learners convert comprehension to ***ideas***, hypotheses, **PLANS**, actions, **Control shifts to learner**.

- Describe an assignment that would require your students to develop their own abstract ideas and explanations about this topic.

Action completes the learning cycle

- Ideas need to be tested by writing, speaking or other means.
- Learner shifts from **receiver** to **producer** of knowledge.

What action will you require of your students to demonstrate ownership of this topic?

When get settled in, handout provides framework for using brain based learning in your classroom

1st day tell students

Going to College

Is NOT

A Spectator Sport!

College students are too busy.

College is too expensive.

For you to *just* attend.

MIDDLE TENNESSEE STATE UNIVERSITY

And if you are going to be even moderately successful,

You have to do more than just SHOW UP!

You are the Players!

We need to structure our classes so that they can be

WINNERS

The Way You Teach Your First Year Seminar Makes a Difference.

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