

13th Annual

Thinking & Learning Conference

GAYLE GREGORY

Friday 20 May

**The Motivated Brain: Improving student
attention, engagement and perseverance**

Session 2

MELBOURNE

GAYLE GREGORY

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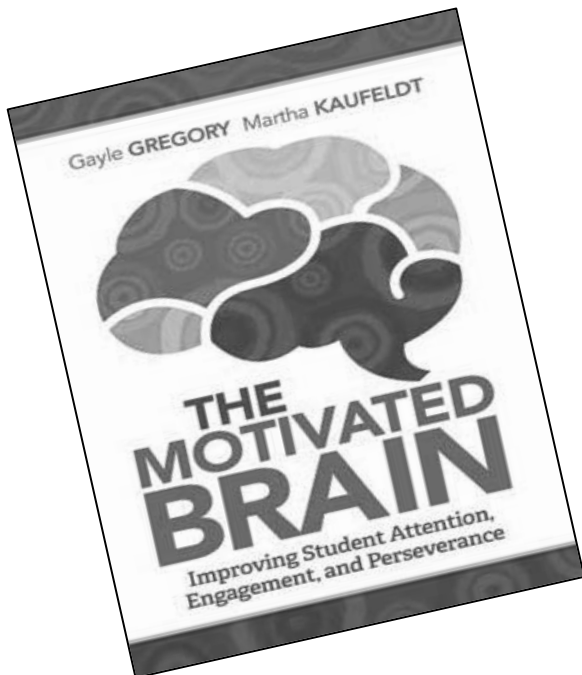
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THE MOTIVATED BRAIN: IMPROVING STUDENT ATTENTION, ENGAGEMENT, AND PERSEVERANCE

Gayle Gregory





**Melbourne, AU
May, 2016**

Learning Intentions:

In this session: we will

- **Introduce the neuroscience of the SEEKING system & motivation**
- **Identify the three levels of the SEEKING system**
- **Suggest some classroom applications that foster the SEEKING system, student engagement and learning.**





NORMS

...ways we can work together effectively


- Start and end on time**
- if you are not clear, ask**
- Invest in your own learning**
- Safe environment to take risks**
- Our signal -**
- Suffering is optional!**
- Celebrate and have fun!**

Gregory/Kaufeldt, The Motivated Brain 2015 ASCD



Agenda

- Introduction, Agenda – Intentions
- What is Motivation? Think of a time?
- What are the conditions?
- What motivates 21st Century Kids?
- Affective Neuroscience: Panksepp-SEEKING
 - Dopaminergic pathway
 - Information Processing System and SEEKING
- 3 Levels of SEEKING
 - Primary – Sensory – environment – instinctual
 - Second. – Learning - process –wanting –relevancy
 - Tertiary – Exec function -metacognition - mindfulness



The Motivated Brain, 2015 Gregory, Kaufeldt

Learning Intentions:



In this session: we will

- **Introduce the neuroscience of the SEEKING system**
- **Identify the three levels of the SEEKING system**
- **Provide classroom applications that foster the SEEKING system.**

Gregory/Kaufeldt, The Motivated Brain 2015 ASCD

Success Criteria

After the session, you will be able to:

- **Explain the SEEKING system**
- **Name the three levels**
- **Identify classroom applications**



Gregory/Kaufeldt, The Motivated Brain 2015 ASCD

THE CHALLENGE!



- What is **Motivation**?
- What is **Engagement**?
- How are they connected?

The Motivated Brain, 2015 Gregory, Kaufeldt

Motivation

- *derived from the Latin movere, to move.*

Motivation is the result of all organisms being in a position to ***“choose, seize and even seek out satisfaction”***.



Motivation:

“The process used to allocate energy to maximize the satisfaction of needs”

Pritchard and Ashwood (2008)



Motivation

- **Moving towards...**
- **Attracted to...**
- **Seeking satisfaction...**
- **“Wanting” ...**



The Motivated Brain, 2015 Gregory, Kaufeldt

What MOTIVATES You???

- What are you “attracted” to – i.e. “SEEK”?
- What things or experiences give you **SATISFACTION**?
- What are things or experiences that you **AVOID**?

Motivation:

The force or energy that results in...

Engagement.

In a classroom it is the complex interaction of teacher, student and curriculum that helps create **motivation** that yields high **engagement**.



What is true “engagement?”

Student engagement occurs when:

- Students make a **psychological** investment in learning.
- Students are **involved** in their work,
- Students **persist** despite challenges and obstacles
- Students take visible **delight** in accomplishing their work.



The Motivated Brain, 2015 Gregory, Kaufeldt

Students who are engaged:

- Learn at high levels and have a profound grasp of what they learn.
- Retain what they learn.
- Can transfer what they learn to new contexts.



What MOTIVATES You???

- What are you “attracted” to – i.e. “SEEK”?
- What things or experiences give you satisfaction?
- What are things or experiences that you AVOID?

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Motivation Memories

+	-

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**What types of things motivate
21st CENTURY LEARNERS?**



What types of things do they AVOID?

Motivating 21st CENTURY LEARNERS?



Diminished Student Engagement

1. Technology
2. Immediate Gratification
3. Fixed Mindset About Ability
4. Lack of Relevance
5. Apathy
6. Poverty
7. Social Isolation
8. Stress

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THE SCIENCE

- 7 Primary *Emotional Systems*
- The **SEEKING** system
- The role of *Dopamine*



Affective Neuroscience

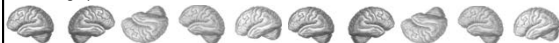
Affective neuroscience is the study of the neural mechanisms of emotion. This interdisciplinary field combines neuroscience with the psychological study of personality, emotion, and mood.

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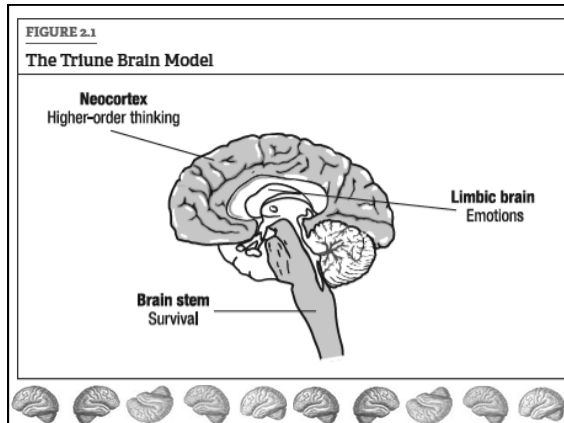
***Affective neuroscience* takes into consideration:**

- basic mental processes, brain functions, and emotional behaviors that all mammals share
- neural mechanisms of emotions
- psychological study of mood, feelings, and personality

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The Motivated Brain, 2015 Gregory, Kaufeldt



Primary Emotional Systems

- 1. **SEEKING- expectancy**
- 2. **FEAR – anxiety**
- 3. **RAGE – anger**
- 4. **LUST – sexual excitement**

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**Additional
Primary Emotional Systems**

- 5. **CARE – Nurture**
- 6. **PANIC/GRIEF – Sadness**
- 7. **PLAY – Social Joy – Friendly interaction**

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SEEKING – Expectancy System

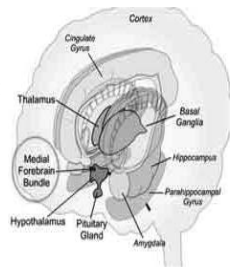
- **Instinctual drive** that urges us to seek (Wanting)
- In charge of maintaining **homeostasis**



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**Dopaminergic Pathway
(Medial Forebrain Bundle – Reward/Pleasure)**

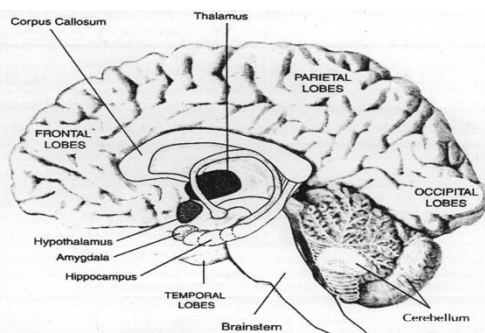
- previously referred to as the brain’s “reward system” because it was believed that the release of dopamine caused us to feel pleasure when we met our goal or received the reward.



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A Medial View of the Brain



Source: Patricia Wolfe, Brain Matters, ASCD, 2001
3.7

The Motivated Brain, 2015 Gregory, Kaufeldt

Seeking System

- In humans, this may be one of the main brain systems that generate and sustain curiosity, even for intellectual pursuits.



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- **OLD belief:** our “reward system” is triggered when we **complete** a task

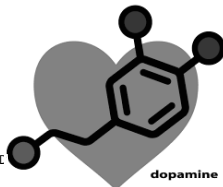


- **NEWSFLASH:** the SEEKING System provides us with continued enthusiasm, interest and motivation while we are in the midst of processing incoming information that is important for us.

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- Dopamine (DA) is one of the main brain chemicals released when we are SEEKING, anticipating, and being motivated.




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Dopamine

- Neurotransmitter - DA
- **Powerswitch** – energizes and invigorates individuals in relation to their environment.
- Mammalian motivational engine
- Gets us Up and Out


“Makes us excited when we think we’re going to get what we need.”



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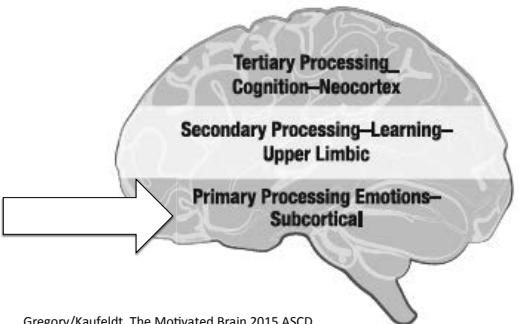
Dopamine is responsible for motivation

- The pleasure that is felt is the good feelings one has in looking forward to something good, not the pleasure of obtaining something good.
- It makes us excited when we think we are going to get what we need




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Three Processing Levels of the SEEKING SYSTEM



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1 

Primary Processing - Instinctual

- “Generating” – Excitement and anticipation.
- Exploring the environment for resources and pleasure

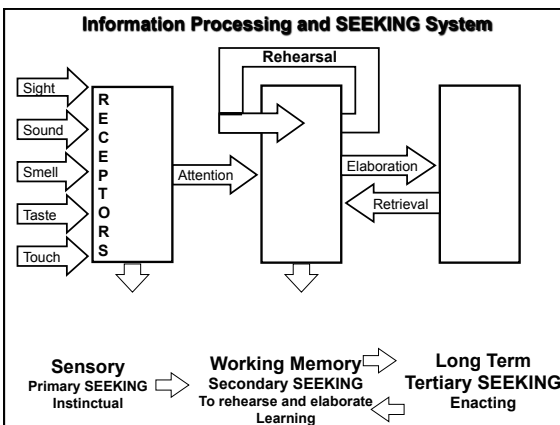
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1 

Primary SEEKING System

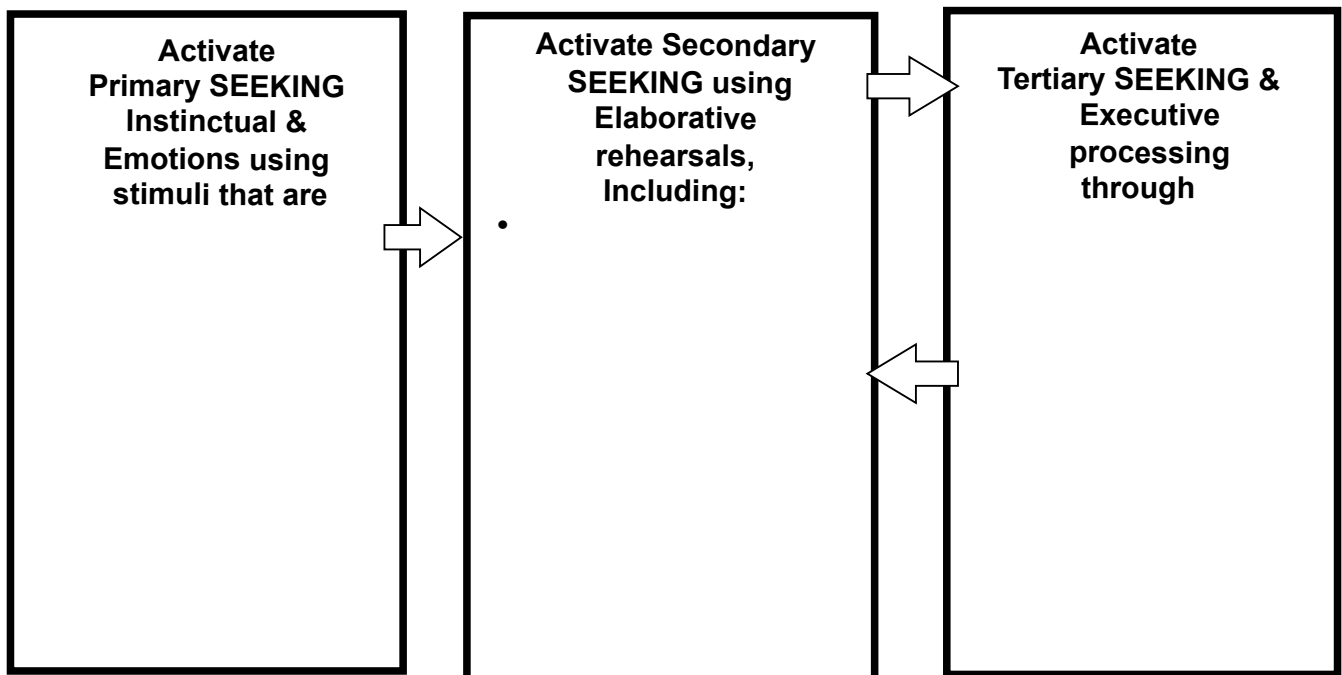
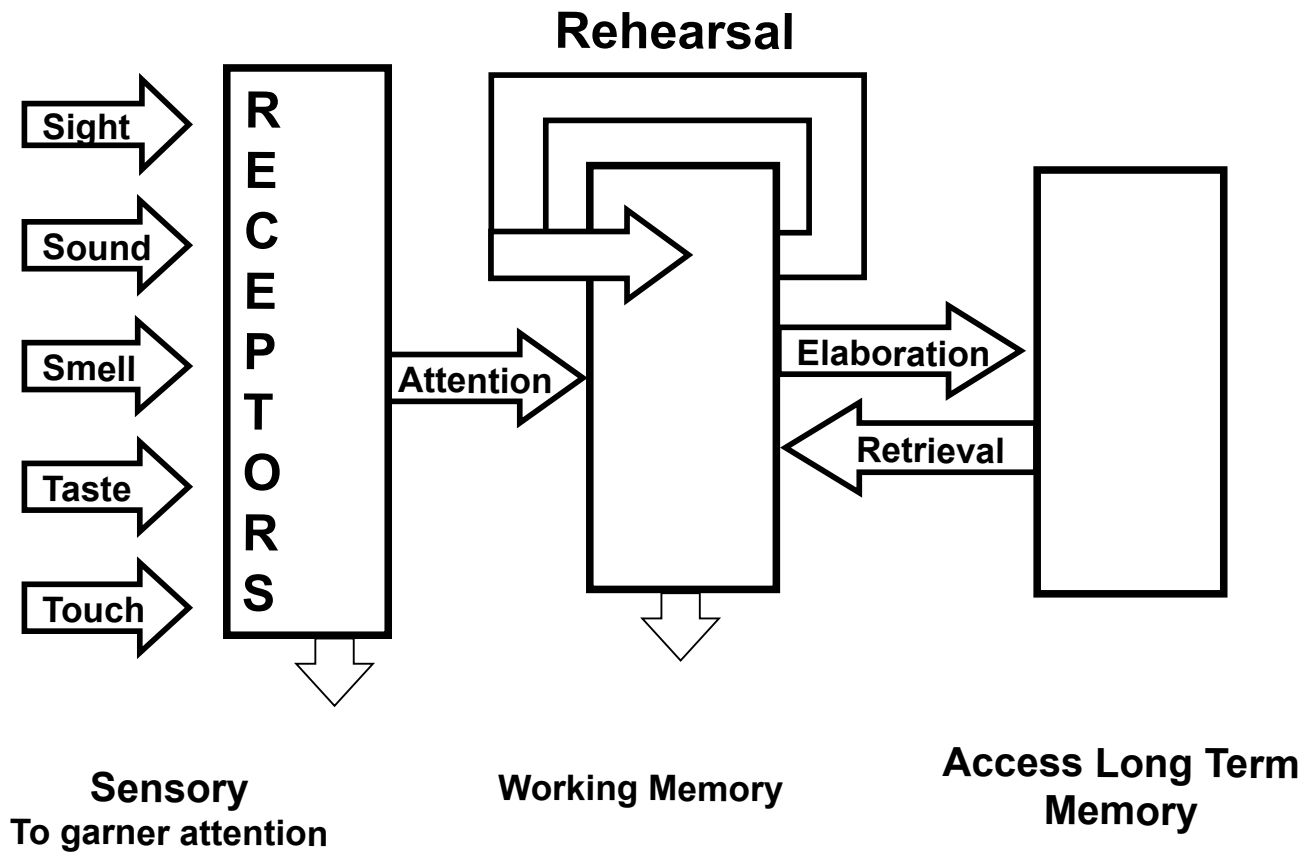
- Curiosity
- Interest
- Foraging
- Anticipation
- Craving

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The Motivated Brain, 2015 Gregory, Kaufeldt

Information Processing and SEEKING System



The Motivated Brain 2015 Gregory, Kaufeldt



Primary Level SEEKING in the Classroom

- Novelty
- Curiosity
- Rich resources and realia
- Play
- Collaboration

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**Novel or interesting
(or threatening)
stimuli garner our attention**

- Colorful visuals, Media
- Interesting sounds, music
- Things to examine (tactile),
- Things to smell and taste

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**Create classroom conditions for
Level 1 SEEKING to flourish:**

- Enriched environments
- Collaborative activities
- Unstructured, spontaneous play
- Recognition of students' needs and preferences
- Time to explore and make choices

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sustained anticipation

The exciting feelings as we look forward to positive experiences and pleasurable activities.

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1 Primary Level SEEKING in the Classroom

- Novelty
- Curiosity
- Rich resources and realia
- Play
- Collaboration

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1 “Anoetic” Consciousness without explicit knowledge


- At the primary process level, we are not *consciously* trying to learn and are intrinsically motivated.
- ‘Here and now’ and requires no higher-level thinking or reflection.

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Brain-Friendly Environment

- Safe & Secure
- Social Connections
- Physically comfortable
- Known plans and expectations
- Clear procedures
- Adequate time
- Immediate feedback




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Motivation:
The force or energy that results in



engagement.
In a classroom it is the complex interaction of teacher, student and curriculum that helps create motivation that yields high engagement.

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What is true “engagement?”

Student engagement occurs when:

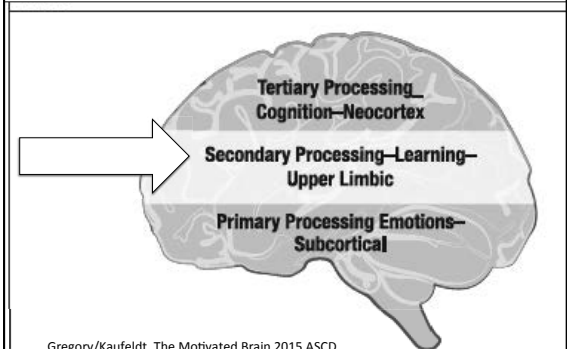
- Students make a **psychological** investment in learning.
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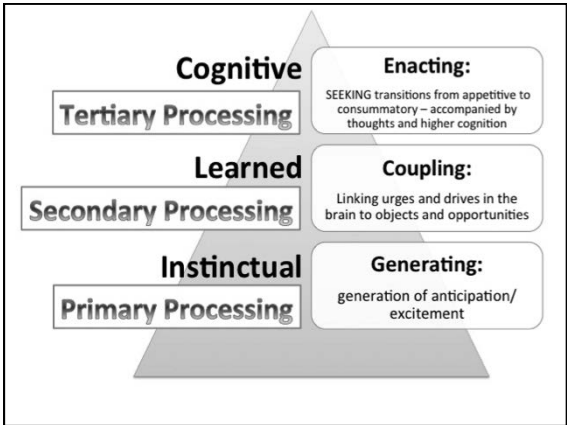
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Three Processing Levels of the SEEKING





2 Secondary Processing - Learned

- “Coupling” – Connecting new info to past experiences and learning.
- Linking urges and drives in the brain to objects and opportunities
- Anticipation builds engagement
- “Liking” & Learning

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Moving to Conscious Learning

- The point at which we move from innate primary processing to secondary processing.



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Satisfaction = Reward

- When we make a connection
- *Opioid system* engages with a short burst of endorphins ,etc.



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Conscious Learning

- Sensory stimulation and feedback from an experience or action
= ***noetic consciousness***
- “knowing about the world.”

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Conscious Learning

- **When an experience gets intense enough or proves to be of value, we can describe and reflect on it.**

- **“Recognized awareness” is the beginning of the learning process.**

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Secondary Processing

- **“Coupling”**
 - Hooking to prior learning
 - Relevance to Daily lives
- **Collaboration**
 - Discussing (Dialogue)
 - Processing

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Encourage the Secondary processing system in the classroom by

- **Discussing new learning experiences;**
- **Connecting to prior learning;**
- **Discovering relevance to students’ daily lives;**
- **Creating sustained anticipation and interest;**

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2 **Wanting – Secondary Processing**

- Make a **connection** to what we already know and have an interest in
- Offer opportunities to **socialize** and connect with others;
- Provide a **“call to action”** to help others with survival needs (CARE);
- Provide us time and tools to be **creative** and to **play**.

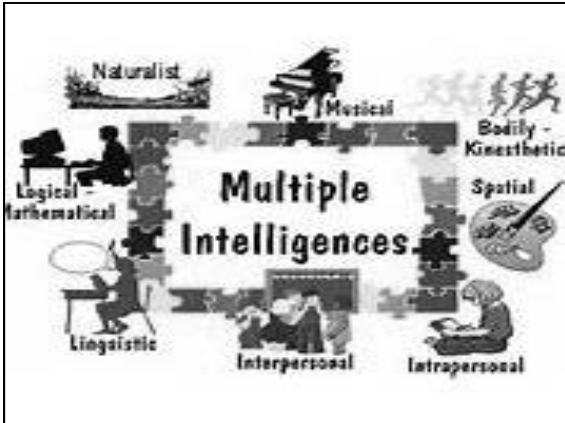
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Social Interaction



- **Social interaction** plays a pivotal role in the process of cognitive development.
- **Multiple interactions among students and with a teacher help facilitate understanding.**

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Multiple Intelligences

Naturalist, Musical, Bodily - Kinesthetic, Spatial, Logical - Mathematical, Linguistic, Interpersonal, Intrapersonal

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Cooperative Group Learning

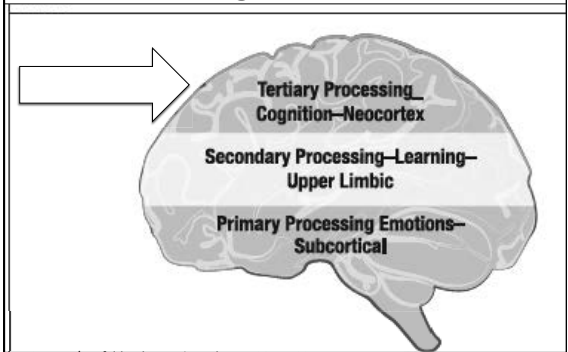
People need to interact with others daily to satisfy our human biological needs. Without human interaction, brain cells actually die.

Hallowell, 2011

"Social environments can either facilitate and enable the growth and integration propensities with which the human psyche is endowed, or they can disrupt, forestall, and fragment these processes resulting in behaviors and inner experiences that represent the darker side of humanity."

Deci and Ryan, 2002)

Three Processing Levels of the SEEKING

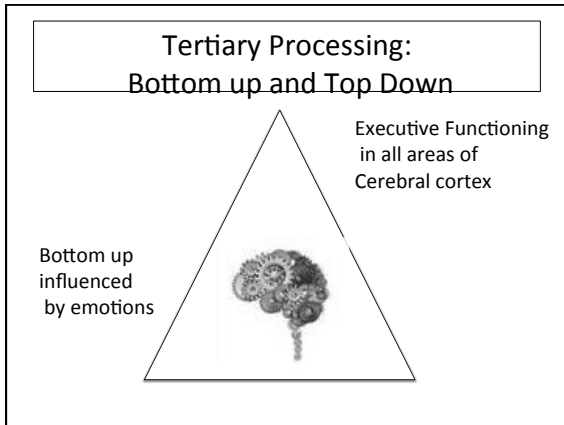


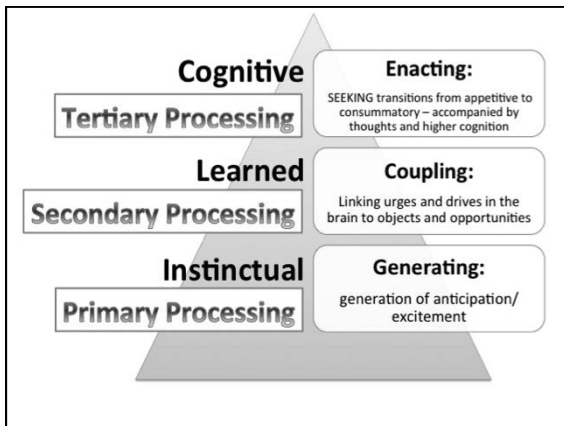
3 Tertiary Processing - Cognitive

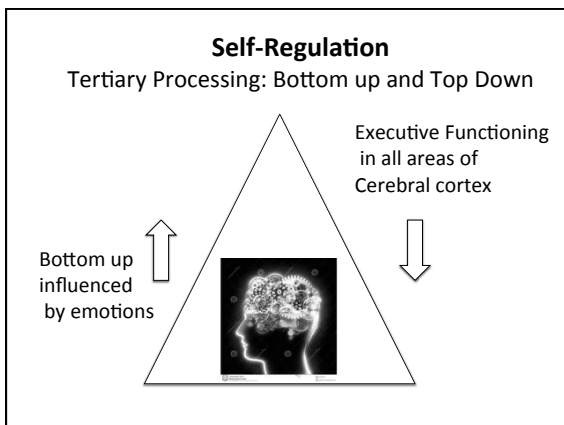
- "Enacting" - Applying ideas
- Higher levels of thinking
- Synthesis and creativity
- SEEKING answers to new questions

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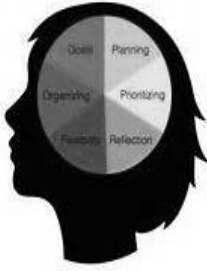






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Executive Functioning



1. **the ability to make plans and organize**
2. holding multiple ideas and thoughts in working **memory**
3. **strategizing and problem-solving,**
4. complex thinking, hypothesizing
5. **keeping track of time**
6. synthesizing by combining knowledge and ideas into new possibilities.


Discussion, Projects and Student Centered Activities
Develop Executive Functions

- Make predictions
- Solve a variety of types of problems
- Pursue inquiries
- Analyze what information they need
- Consider how to acquire any skills or knowledge they lack to reach desirable goals


- Judy Willis, Edutopia

Model Executive Functioning

- Judgment
- Prioritizing
- Setting Goals: feedback, monitoring
- Prior Knowledge activation
- Metacognition




The Motivated Brain, 2015 Gregory, Kaufeldt

Metacognitive knowledge
—awareness of one’s thinking 

- **Awareness of knowledge**—understanding what one knows, doesn’t know, and wants to know
- **Awareness of thinking**—understanding the task, being able to identify the problem, and being able to conceptualize what needs to happen first
- **Awareness of thinking strategies**—understanding the various approaches that might be used to be successful

To Build Metacognitive Skills



- Predicting outcomes
- Evaluating work
- Questioning (teacher and significant other)
- Encouraging self questioning

What is really needed to prepare students as citizens and workers in the 21st Century?

- The importance of *play, passion, and purpose* in stimulating young people’s intrinsic motivation. (Focus on tasks worth doing.)
- It will be not how much you know, but rather what you can do with what you know.
- Having lots of practice making informed decisions, based on evidence.
(Tony Wagner: “Creating Innovators”)

The Motivated Brain, 2015 Gregory, Kaufeldt

Can we design schools to cultivate creative and entrepreneurial talents for citizens of the 21st Century?

- Provide opportunities for students to have freedom to think and freedom to invent.
- Provide schools with the autonomy to innovate with an entrepreneurial spirit.
- Encourage open-ended learning that will produce creative problem-solvers more likely to succeed in the competitive world.

(Yong Zhao, World Class Learners)

5 Classroom Conditions to Maximize Student Motivation and Engagement

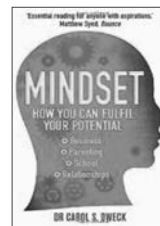
1. Maintain Brain-Friendly Classroom Environments
2. Orchestrate Collaboration & Social Interactions
3. Teach to Each Student's Sweet Spot
4. Promote Growth Mindsets
5. Demonstrate Teacher Passion & Enthusiasm

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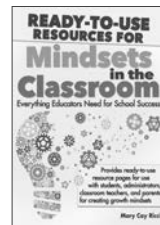
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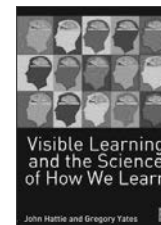
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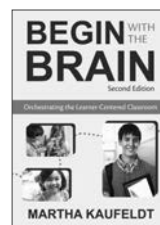
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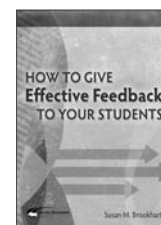
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C05531



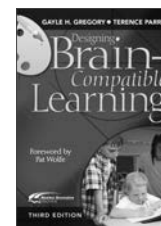
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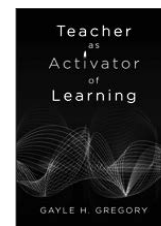
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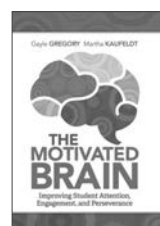
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