Brain Based Research as it Relates to Literacy & the RtI Process

The Physiology of Literacy

Presentation & Power Point By:
Nina Kuhn
kuhnn@lake.k12.us
Objectives:

- Participants will gain a deeper understanding of the RtI Process as a solution to problems with literacy.

- Participants will analyze the relationship between brain research and literacy.
Presentation Agenda

- History of the RtI Model
- RtI Overview
- Brain Research & Learning
  - Auditory Processing
  - Visual Processing
  - Visual Motor Integration
- Question & Answer Session
Focus Question

Why RtI?

Reading
Phonics
Vocabulary
Comprehension
History of the RtI Model

Old Model

- Discrepancy Model
  - Compares IQ (WISC IV or WIAT) and actual achievement and then examines the difference
  - Sink

New Model

- RtI Model
  - Looks for curricular interventions as soon as the child begins having problems and tries various research based interventions based on the student’s responses
  - Swim
Tiered RTI Model

RTI

**Tier 3:** 5%-7%
Intensive Interventions

**Tier 2:** 10%-15%
Targeted Interventions and
progress monitoring

**Tier 1:** 80%-90%
Core academic and behavioral instruction,
Universal Supports, Universal Screening
Instructional and Behavioral Interventions

A child miseducated is a child lost.
~ John F. Kennedy
Problem Solving Process

Step 1 - Problem Identification
What’s the problem?

Step 2 - Problem Analysis
Why is this occurring?

Step 3 - Intervention Design
What are we going to do about it?

Step 4 - Response to Intervention
Is it working?

“Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it’s the only thing that ever has.”
~ Margaret Mead
Focus Question

How does the brain influence learning and literacy?
Brain Research & Learning

New Born Brain

Brain with Experiences
Basic Brain Learning Principles

- Complex adaptive system
- The brain is social
- Meaning occurs through patterning
- Simultaneously perceives & creates
- Learning is developmental
- Every brain is uniquely organized
- Complex learning is enhanced by challenge and inhibited by threat
4 Pillars of Human Learning

- Gathering ~ Sensory cortex
  - Visual, auditory, kinesthetic, tactile
- Analyzing ~ Back integrative cortex
- Creating ~ Front integrative cortex
- Acting ~ Motor Cortex

“Everything comes together in a moment”
~ Die Gestalt
Essential Ingredients for Learning

- Attention
  - Naturally engage the learner
  - Knowledge enters through existing neurons
  - Involves focused & peripheral attention

- Emotion
  - Strengthens learning
  - Concomitant exposure
  - Critical to patterning
Focus Question

How does Auditory processing affect literacy?
Auditory Processing

- Broca’s Area ~ Speech & Language Production
  - Productive Language
  - Fluency issues

- Wernicke’s Area ~ Language Comprehension
  - Receptive Language
  - Word caller
  - Multi-step directions are problematic
    - ADD/ADHD
Focus Question
How do the mechanics of the eye impact literacy?
Eye Structure
A Lesson in Fixation

**DO NOT READ** the words, say aloud the **COLOR** of each word.

YELLOW BLUE ORANGE
BLACK RED GREEN
PURPLE YELLOW RED
ORANGE GREEN BLACK
BLUE RED PURPLE
GREEN BLUE ORANGE
Visual Processing

- Steropsis
  - 3-dimensional objects
  - Tactile experiences
- Attention Span
  - Metronome
- Visual Acuity
  - Spelling & outlining letters
- Convergence
  - Esophoria
  - Exophoria
- Directionality/Laterality
  - Reversals
  - Gross motor & Midline activities
Steropsis
Directionality
Visual Processing Continued

- Binocular Coordination
  - Highlights Magazine

- Visualization
  - To see things in the mind’s eye
  - Tessellations

- Visual Motor Integration
  - Zipping/Buttoning
  - Chop Sticks
  - Jig Saw Puzzles
  - Geometry Shapes
  - Space Man

The future depends on what we do in the present.
~ Mahatma Gandhi
A Final Thought...

RTI Student Success
“Anything is possible”
~ Nina Kuhn
~
kuhnn@lake.k12.us
~
Lake County Public Schools