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Brain Research and Instruction
Bridging Neuroscience and Education
"Science and Strategies"

Janet N. Zadina, Ph.D. ***Brain Research and Instruction***

Professional Development Workshops and Long-Term Training:

Multiple Pathways to the Student Brain:

Using Brain Research to Raise Achievement

GOAL: A combination of workshops, printed material and assignments, and support over a period of time will enable a great deal of research-based information and strategies to be acquired and implemented to create long-term change and to raise achievement.

OVERVIEW

In these exciting presentations, loaded with real brain images and scattered with interactive experiences, attendees will actually see how learning takes place in the brain through powerful images. Neuroscience indicates that the more modalities by which learners encode information, the easier that information is to learn and recall. Go beyond visual, auditory, and kinesthetic and find out about other powerful learning pathways in the brain! Acquire strategies for stimulating these pathways in your classroom activities and assignments. Learn how to avoid "drill and kill" and get more learning in less time. See for yourself how the brain actually learns. Create an Action Plan and leave with credible strategies based on current neuroscience. Be prepared to laugh, learn, and engage!

WORKSHOP ONE

Materials: *Six Weeks to a Brain-Compatible Classroom* and *Multiple Pathways to the Student Brain*

Content: 3 hour presentation

1. **What is and Isn't True about Brain-Based Learning:** Are you perpetuating neuromyths in your practices? Take a quiz and find out. Faculty can't afford to waste valuable learning time engaging in practices based on old myths about learning.

2. **Non-cognitive Factors: Are They Ready to Learn?**
   A. Intention and Beliefs
   B. Arousal
   C. Existing Neural Network

3. **What is Learning?**
   A. Definitions
   B. Making Connections: It isn't enough to fire it, you must wire it!
   C. Learn the difference between thinking and learning and discover what is required for that to happen.
   D. Discover the most important factor in learning.
   E. Acquire essential strategies for true learning

4. **Using Multiple Pathways to Raise Achievement: Part One**
   A. Sensory Motor: Acquire strategies for making information easier to remember.
      1. Discover the "learning style" that applies to all learners
      2. Understand the difference between the receptive and expressive pathways
      3. Acquire strategies for using more expressive pathways to raise achievement
      4. Use motor skills for better learning

Assignments:

1. Over the next semester complete the workbook *Six Weeks to a Brain-Compatible Classroom*. There are five brief lessons per Chapter. Select 3 per week.
2. Read Chapter 1 in *Multiple Pathways to the Student Brain*
3. Create and use a Homework Menu to reach the varying strengths and address weaknesses in struggling learners.
4. Participate in one in-house professional development session to share questions, insights and strategies.

WORKSHOP TWO

Materials*: Multiple Pathways to the Student Brain*

Content: 3 Hour Presentation

Using Multiple Pathways to Raise Achievement: Part Two

Frontal Lobe Pathway: Find out which part of the brain needs your help to develop. Learn why some students tune out after 10 minutes. Acquire strategies that enable students to have better learning and a better life.

Reward Pathway: Activating the reward pathway in the brain releases feel-good chemicals, such as dopamine, and the behavior is reinforced and persists. Activation of the reward pathway increases motivation and engagement. See via brain scans what academic behaviors activate the reward pathway in the brain and what reduce it. Discover the simple task that raised achievement more than additional study time. Acquire strategies for motivating and engagig diverse learners.

Social Pathway: The brain is a social brain. However, there can be pitfalls as well as advantages. Discover how the brain is wired to learn from others and how to maximize that brain process.

Attention and Working Memory Pathways:

Attention drives learning. It is attention that creates the plasticity that leads to real learning. Learn how attention works in the brain and how to use it more effectively.

Working memory is an underlying brain process, invisible yet critical to learning and achievement. In fact, as much as 80% of math difficulty may actually be due to working memory limitations. Reading comprehension and writing difficulty may be due to working memory limitations. Understand the nature of working memory and acquire strategies for addressing this critical process.

Assignments:

1. Read Chapters 2-9 over the semester in *Multiple Pathways to the Student Brain*. Each week implement one idea per chapter. Continue using that strategy each week thereafter, while adding one new strategy per week.
2. Add new items to your Homework Menu with the goal of having each pathway utilized.
3. Create a lesson plan for one unit that utilizes every pathway. Every pathway wouldn't be used every day, but at least once over the unit. See handout for this. Share your plan with others at an in-house professional development session.
4. Participate in an in-house professional development sessions to share questions, strategies, and ideas.

Workshop Three:

Materials: The workbook*: Creating an Emotionally Sensitive Classroom: Addressing Anxiety, Stress, and Trauma to Raise Achievement*

Content: *3 hour workshop*

Emotion Pathway: At least 30% of your students have enough anxiety to impair learning. Students from poverty have more trauma that impedes learning. Adult learners have even more anxiety, especially anxiety about returning to school. 23% of immigrants have Post-Traumatic Stress Disorder. Learn how stress impairs academic performance and how to reduce this obstacle to achievement. Discover classroom practices that can make stress worse and learn positive strategies to reduce anxiety and stress.

Faculty well-being is a serious concern. A happy teacher is a better teacher. Unfortunately, faculty members are under ever-increasing stress, as are students. This stress acts on the brain in ways that reduce performance. If unaddressed and prolonged, this can lead to burnout. Burnout then leads to impaired academic performance, absenteeism, procrastination, and faculty attrition, as well as mental and physical health issues. The good news is that burnout is a process that can be interrupted before it leads to severe and chronic health and mental issues and before it affects performance in the classroom. This presentation provides faculty with simple, effective, and science-based strategies for reducing stress.

Assignments:

1. Complete the workbook over the semester.
2. Add one new strategy per week while continuing to use the new ones you have added.
3. Participate in an in-house professional development session to share ideas and strategies and get feedback from peers.

Note: To achieve ideal implementation, it may be best to break workshop Two into 2 workshops so they have less to read and more time to implement and adjust to new ideas. This would add to the cost of this program.

Alternatively, if the budget does not allow, Workshop One and Two could be combined into one full day and the assignments combined but that would defeat the goal of creating as much long-term change as possible. This would reduce the cost.

You may add virtual sessions as needed. However, with the materials provided, this could easily and effectively be done in-house and by including a follow-up session in each return workshop.