I. Learning Theory
   a. Almost all theories incorporate neuroscience; however, not all have been applied.
      i. Examples: Transformational Learning, Problem Based Learning, Design Based, Team Based Learning, Constructivism
   b. Some may have elements of inconsistency with contemporary science
      i. Example: Cognitivism, Behaviorism, Humanism
   c. The objective of using neuroscience is to provide another data element to explain the holes in the theories
      i. People do not have to be neuroscientist to understand how they science applies to working with various populations.
      ii. The research can create the Ah-ha “that is why my client is progressing or not progressing”. The objective is to move support from a deficit model to an empowerment model.

II. Neuroscience
   a. Executive Function
      i. Peak Periods: Child, Adolescent, Adult
      ii. Resource allocation: allocations mental focus (attention), effort (problem-solving), and information distribution (adaptation)
      iii. Frontal lobe in particular the pre-frontal cortex
      iv. Develop and reinforcement to memory is linked to beliefs, social context, and values
      v. Social element of adaptation in particular is linked to executive function
   b. Memory
      i. Types: Sensory, Short-term, Long-term (variations)
         1. Implicit (unconscious) – Procedural (tasks)
         2. Explicit (conscious) – Declarative (facts: episodic or experiential)
         3. Memory Integration: Habit – Procedural memory reinforced with declarative memory
      ii. Working memory utilizes short and long-term interface
      iii. Optimal learning comes from engaging all levels of memory
         1. Repetition, Reflection, Reinforcement, Realization, and Rubrics
   c. Motivation/Grit
      i. Acquired and Developed Behaviors
      ii. Part of executive function, part of memory, and part of the limbic and endocrine systems
iii. Labeling (give meaning), reappraisal (see differently), mindfulness (consciously aware), coherence (balancing physical and mental state), drive (intentional focus)

III. Application Techniques

a. Application Techniques can be used in teaching, coaching/mentoring, program development, resource determination, and similar areas.

b. Primary Mediation/Instructional
   i. Reflection (Executive Function, Memory, Grit, Integration, Behavior)
      1. Provide alternative context. Ask students to reinterpret information based on the new context
      2. Provide relationship diagrams, impact, and assumptions
      3. Layer learning lessons and show the relationships between layers, other courses, and application of knowledge
   ii. Validation (Grit, Behavior)
      1. Create a safe outlet for the students
      2. Non-graded, non-judging, a place to think freely
   iii. Use Team-based Learning Activities requiring communication, collaboration and research (Executive Function, Memory, Grit, Integration, Behavior)
   iv. Memory recall (Memory, Integration)
      1. Exams, Quizzes (Oral and Written)
      2. Games
      3. Role-play: “convince me why”, “tell me everything you know”, “tell me but without certain words/phrases/data”
   v. Abstraction
      1. Personal reflection
      2. Exams and Assessment
      3. Elements with no obvious pattern

c. Program Design/Resources
   i. Problem Solving (Executive Function, Memory, Some Integration)
   ii. Role-model and use evidence (Memory, Integration, Behavior)
      1. Social Impact Analysis
      2. Experience consequence
      3. Critical Events
   iii. Answer/Provide the Why (Executive Function, Integration)
   iv. Habit reinforcement (Memory, Integration, Behavior)
      1. Adapt to sudden changes and social constraints/context
2. Repetition, Reflection, Reinforcement, Realization, and Rubrics
   v. Social comparative with personal reflection
      1. Cost-benefit
      2. Critical Event

IV. References

  http://education.jhu.edu/PD/newhorizons/Journals/Fall2010/
Cross-section of Human Brain with Functional Descriptions