

## Module 3.2 Supporting New Learning Problems in the Classroom

### What are the Intermediate Processes? Impact on Learning and SLD

- Success within this level is based on the proper functioning of fundamental processes
- Critical difference is the integration of functions to process complex information
- Acquisition of specific information and broad knowledge-critical for later use (skills)

### Intermediate Processes: Learning Processes Key Concepts

- All learning is a complex neurocognitive process that needs the successful integration of several brain-based functions
- In the BBB model, new learning is related to “knowing” and reasoning such as inductive, deductive, and abstract reasoning
- While several regions of the brain are active during new learning, the right hemisphere plays a major role
- To learn new concepts and to understand information, one must “merge” what is novel to what is known importance of activating prior knowledge
- Poor math performance is highly linked to poor novel reasoning

### Expert Guidance

- Remember to develop a positive philosophy of SLDs. Attitudes about SLDs will impact the success of student interventions. Reassure students, stay positive and expect realistic gains
- Students with very low reasoning abilities present special challenges as they are in between SSN and SLD
- While most SLD referral centers on reading problems, math disabilities are under-identified
- There is a high comorbidity rate between reading and math disorders-same verbal reasoning, working memory, and processing speed issues maybe implicated with both disabilities
- Students with significant reasoning issues may need experiential opportunities, manipulatives and several trials of learning, which involves special teaching and testing consideration
- Consider “degree” of deficits related to nonverbal reasoning
- Students that struggle to learn new information may develop behavioral and emotional problems, especially anxiety
- There are no 100% effective interventions, be critical when examining commercial programs

## **Intervention: Low Reasoning Abilities**

- Critical to acquiring knowledge is the ability to reason and integrate increasing amounts of information that varies in complexity to existing knowledge. New learning can be impacted by memory deficits-memory is a “bridge” that is necessary to merge old with new information
- In general, students with low reasoning ability will benefit from the same effective teaching strategies that benefit all students, which are explicit and direct instruction-there is no magic intervention
- Low reasoning typically impacts basic math skills and quantitative comprehension, which may be an early indication or reasoning deficits
- Increase dose of explicit and direct instruction in small groups
  - Slower pace and break down task in very small steps
  - Frequent corrective feedback
  - Target specific skills (not cognitive area)
  - Several opportunities for practice
  - Make learning relevant (real word experiences, examples)
  - Use exemplars, visual and manipulatives
  - “Teach me” opportunities

## **Interventions: Math**

- More than just arithmetic, including quantitative reasoning
- Quantitative and magnitude estimation
- Symbolic number sense (precise quantity)
- Working memory is key and may need to reduce WM demand
- Key Research
  - Teach students using explicit instruction on a regular basis
  - Teach students using multiple instructional models and examples
  - Have students verbalize decision and solutions to a math problem
  - Providing immediate feedback and connect new learning to previous learning
  - Teach students to visually represent the information in math problems
  - Teach students to solve problems using multiple/heuristic strategies
  - Allow for peer-assisted instruction to students
  - Use of manipulatives- developmentally appropriate
- Five Strands of Mathematical Proficiency
  - Procedural Fluency- skill in carrying out procedures flexibly, accurately, efficiently, and appropriately
  - Strategic Competence- ability to formulate, represent, and solve mathematical problems

- Adaptive reasoning- capacity for logical thought, reflections, explanation and justification
- Conceptual understanding- comprehension of mathematical concepts, operations, and relations
- Productive disposition- habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy

### **Accommodations**

- Students with very low reasoning ability may need several opportunities to retake tests and quizzes
- Emphasize mastery approach vs. performance approach
- Allow for notes and devices on tests (calculator)
- Allow for manipulatives and visual when describing new concepts and/or testing
- Encourage student self-advocacy-actively seek help when they don't understand
- Actively check for understanding
- Allow for alternative ways to express knowledge