“The human mind is like an umbrella, it functions best when open.”

Walter Gropius

Cognition in the Classroom & Beyond

Continuous Improvement Conference
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Adapted the work of:
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Feel the challenge

Mathematics
http://www.pbs.org/wgbh/misunderstoodminds/experiences/mathexp3b.html
• Do you know what “FIE” stands for?
• Have you seen an FIE?
• Where do you find an FIE?
• Why does an FIE matter?; What does it have to do with the IEP?
• Have you used an FIE for planning?
• How many cognitive areas are evaluated/considered?
Navigating the FIE
Sections of the Full Individual Evaluation

- Reason for Referral
- Speech-Language/Communication
- Health/Motor
- Sociological
- Emotional/Behavioral
- Intelligence and Adaptive Behavior
- Academic Achievement
- Assistive Technology
- Recommendations
7 cognitive primary processes

• Comprehension Knowledge/Crystallized Intelligence
• Auditory Processing
• Visual Processing
• Long-Term Memory
• Short-Term Working Memory
• Fluid Reasoning
• Processing Speed
Think of Crystallized Knowledge as a student’s own personal library.

Crystallized Knowledge

General Knowledge & Comprehension
Students with **Comprehension & Knowledge** deficits may have …

- Reduced vocabulary skills
- Limited background knowledge
- Difficulty answering factual questions
- Difficulty with comprehending spoken and written language
- No desire to play word games
COMPREHENSION/KNOWLEDGE

Possible Accommodations:

* Note taking assistance or copy of notes
* Graphic organizers
* Word bank
* Highlight key words or facts
* Simplified vocabulary in information and directions (*this may be a modification*)
* Chunk information into smaller pieces
* Mnemonics to help retrieve knowledge
Instructional Strategies for Comprehension & Knowledge Weaknesses

*Pre-teach vocabulary
*Repeat skills and vocabulary
*Chunk information
*Use simplified vocabulary (*this may be a modification*)
*Word walls/ student-made dictionary
*Create language and experience rich environment (label items, videos, virtual field trips, visual aids,...)
*Teach synonyms for math vocab (i.e - sum = add)
Auditory Processing

Ability to hold, sequence, and process or understand what they heard
Students with Auditory Processing deficits may have difficulty with …

• Decoding Words
• Spelling
• Learning a language
• Musical skills
• Telling the difference between words (fair vs pair)
• Background noise
• Following Directions
AUDITORY PROCESSING

Possible Accommodations:
* Use visual aids
* Copy of class notes
* Preferential seating close to teacher
* Spelling assistance
* Listening guides for information given orally
* Checklists
* Small group
* Check often for comprehension
Auditory Processing Instructional Strategies

*Expose to sounds, music, and language as much as possible
*Read aloud to students for exposure
*Use decodable text for practice
*Direct phonics instruction
*Provide drill & practice for memorizing information
*Teach spelling using word groups
*Provide an environment with little auditory distractions
*Accompany oral information with visual materials
*Deliver information in smaller portions
Visual Processing

Use mental imagery to solve problems
What do you see in the image below?
Students with **Visual Processing** deficits may have difficulty with …

- Manipulating and transforming visual patterns/stimuli
- Completing a maze
- Interpreting a graph or chart
- Putting puzzles together
- Completing worksheets
- Reading maps
- Not losing their place while reading
- Confusing math symbols
- Mentally seeing parts of an object
VISUAL PROCESSING

Possible Accommodations:

* Allow to write on same sheet of paper as questions
* Allow oral response
* Allow more white space on a page
* Place marker
* Highlight or color code important text
* Bulleted lists for lengthy text
* Manipulatives (*this may be a modification*)
* Graph paper for alignment
* Verbal directions
* Verbal descriptions of info including charts, graphs, maps
Visual Processing Instructional Strategies

* Point out important details and give examples of visual information
* Encourage student to verbalize/elaborate on what they have read or seen
* Use graph paper to aid in aligning numbers
* Color coding
* Teach proof-reading strategies/peer edit
* Provide repeated exposures to printed visuals
* Use raised/darker lined paper
Long Term Memory

The ability to store, consolidate, and retrieve information over period time

Think of Long Term Memory as a students’ filing cabinet
Students with **Long Term Memory** deficits may have difficulty with …

- Learning names of letters in alphabet
- Memorization of facts
- Remembering from one day to the next
- Remembering, even routine steps or activities
- Remembering experiences
LONG-TERM STORAGE/RETRIEVAL

Possible Accommodations:
* Supplemental Aids - mnemonics, charts, graphics
* Repeat important points or information
* Visual or verbal cues
* Memory aids - rhymes, acronyms, anagrams, associations
* Checklist of steps (processes or directions)
* Calculator for math
* Assignment notebook
L-TM Instructional Strategies

* Repeated practice with review of newly presented information
* Teach memory strategies (verbal rehearsal to support encoding)
* Review/rehearse information for short periods of time several times a day.
* Use visual representations
* Use multiple modalities when teaching new concepts (pair written with verbal)
* Use lists/prompts to facilitate recall
* Gradually introduce new concepts
* Provide overlearning (practice beyond mastery)
* Help student group information into categories
Short-Term Working Memory

Remembering for immediate recall
Students with Short Term/Working Memory deficits may have difficulty with:

- Sounding out words
- Spelling
- Following directions
- Doing mental math
- Remembering what was just read
- Taking notes
- Multi-step math problems
SHORT TERM/WORKING MEMORY

Possible Accommodations:
* Visual Aids
* Supplemental aids - charts, mnemonics, & graphics
* Calculator
* Checklist of steps
* Note taking assistance or copy of class notes
* Chunk information into smaller portions
* Break instructions into smaller parts
S-TWM Instructional Strategies

* Short, simple instructions
* Proved opportunities for repeated practice and review
* Provide supports (lecture notes, study guides, written directions) to supplement oral instructions
* Breakdown instructional steps
* Supplemental Aids - math charts, mnemonics, graphics
* Outline procedural & provide procedural guides to use when approaching problems
* Provide overlearning (practice beyond mastery)
* Repeat important information at a high rate
Fluid Reasoning

Solving novel problems
Students with Fluid Reasoning or Problem-Solving deficits may have difficulty with …

• Drawing inferences

• Problem solving

• Thinking creatively/outside the box

• Generalizing skills/knowledge
FLUID REASONING

Possible Accommodations:
* Manipulatives
* Supplemental Aids
* Checklist of steps for procedures
* Graphic organizers
* Study guides
* Pair with peer
* Check for understanding and provide immediate feedback during learning shifts/changes in task demands
Fluid Reasoning Instructional Strategies

* Explicitly teach multiple approaches to solving problems
* Step-by-step instructions
* Use manipulative to make information more concrete
* Provide analogies that students can relate to
* Model think aloud procedures
* Teach problem-solving strategies
* Use graphic organizers to assist with information
* Require students to show work
* Provide opportunities to sort, classify, & categorize
Processing Speed

How quickly you can do a rote task
Students with Processing Speed deficits may have difficulty with …

- Completing tasks/tests within time constraints
- Find multiple, complex processes confusing (e.g. copying from board, taking notes)
- Answering questions when asked
PROCESSING SPEED

Possible Accommodations:
* Note taking assistance
* Extended time
* Shortened assignments w/o eliminating TEKS
* Chunk information and assignments into smaller portions
* Graphic organizers to organize information
* Provide copy of notes or cloze notes
Processing Speed Instructional Strategies

* Allow time to respond orally or prepare with question before calling on student
* Repetitive practice, speed drills, & computer games that require quick decisions
* Allow student to preview information
* Provide timed activities (or self timer) to build speed and automaticity with basic skills
* Use formats with reduced written output formats (i.e. - multiple choice, T/F, fill in the blank,...) to accommodate for slow writing fluency
Feel the challenge

Reading
http://www.pbs.org/wgbh/misunderstoodminds/experiences/readexp2a.html
Using the SAMPLE FIE:

- Identify strengths
- Identify weaknesses
- Locate links to achievement
- Locate recommendations
## Interpretation of Evaluation Results

The table below shows the interpretation of scores based on standard deviations from the mean. The percentages indicate the proportion of the population that falls within each standard deviation range.

<table>
<thead>
<tr>
<th>Score Type</th>
<th>-3 SD</th>
<th>-2 SD</th>
<th>Mean</th>
<th>-1 SD</th>
<th>1 SD</th>
<th>+1 SD</th>
<th>+2 SD</th>
<th>+3 SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>55</td>
<td>70</td>
<td>85</td>
<td>100</td>
<td>115</td>
<td>130</td>
<td>145</td>
<td></td>
</tr>
<tr>
<td>Scaled</td>
<td>1</td>
<td>4</td>
<td>7</td>
<td>10</td>
<td>13</td>
<td>16</td>
<td>19</td>
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<tr>
<td>T score</td>
<td>20</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Percentile rank</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>50</td>
<td>70</td>
<td>99</td>
</tr>
</tbody>
</table>

- **2.14%** of the population falls within $-3$ standard deviations (SD) of the mean.
- **13.59%** of the population falls within $-2$ SD of the mean.
- **34.13%** of the population falls within $-1$ SD of the mean.
- **34.13%** of the population falls within $+1$ SD of the mean.
- **13.59%** of the population falls within $+2$ SD of the mean.
- **2.14%** of the population falls within $+3$ SD of the mean.
<table>
<thead>
<tr>
<th>Cognitive Process</th>
<th>Description</th>
<th>Real Life Examples</th>
<th>General Academic Impact</th>
<th>Links to Achievement</th>
<th>Accommodations</th>
<th>Strategies/Interventions</th>
</tr>
</thead>
</table>
| Crystallized Intelligence (Gc)    | Crystallizes intelligence reflects one's vocabulary and overall knowledge of the world. A variety of life experiences and exposure to education influences development in this area. | *Words with Friends  
*Scrabble  
*Learning a new language  
*Use Gc @ school all the time! | *Lack of Background knowledge to relate to new knowledge  
*Weak Vocabulary (speaking/comprehension)  
*Difficulty generalizing ideas  
*Difficulty learning Academic Vocabulary | *Reading Comprehension  
*Math Calculation  
*Math Reasoning  
*Written Expression  
*Oral Expression  
*Listening Comprehension | *Note taking assistance  
*Graphic Organizers  
*Word Bank  
*Highlight key words or facts  
*Simplified Vocabulary in information and directions  
*Chunk Information into smaller pieces  
*Mnemonics to help retrieve knowledge | *Pre-teach vocabulary  
*Repeat skills and vocabulary  
*Chunk Information  
*Use Simplified Vocabulary  
*Word Walls/ Student-made dictionary  
*Create language and experience rich environment (label items, videos, virtual field trips, visual aids...)  
*Teach synonyms for math vocab (i.e - sum = add) |
| Auditory Processing (Ga)          | Ability to analyze and synthesize auditory information including being able to distinguish and separate sounds | *I say “chair” but student hears “hair”  
*Impairs sound discrimination  
*Background noise can impact | *Difficulties with Listening Comprehension  
*Difficulty remember directions/information presented orally  
*Oral drills are difficult  
*Slow processing speed  
*Difficulty filtering out background noise | *Basic Reading  
*Written Expression  
*Listening Comprehension | *Use Visual Aids  
*Copy of Class Notes  
*Preferential Seating close to teacher  
*Spelling Assistance  
*Listening guides for information given orally  
*Checklists  
*Small group  
*Check often for comprehension | *Expose to sounds, music, and language as much as possible  
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*Deliver information in smaller portions |
How can you use what you just learned when you go back to your campus?
Questions?