

# Tech-xecutive Functioning: Technology to Support Executive Functioning

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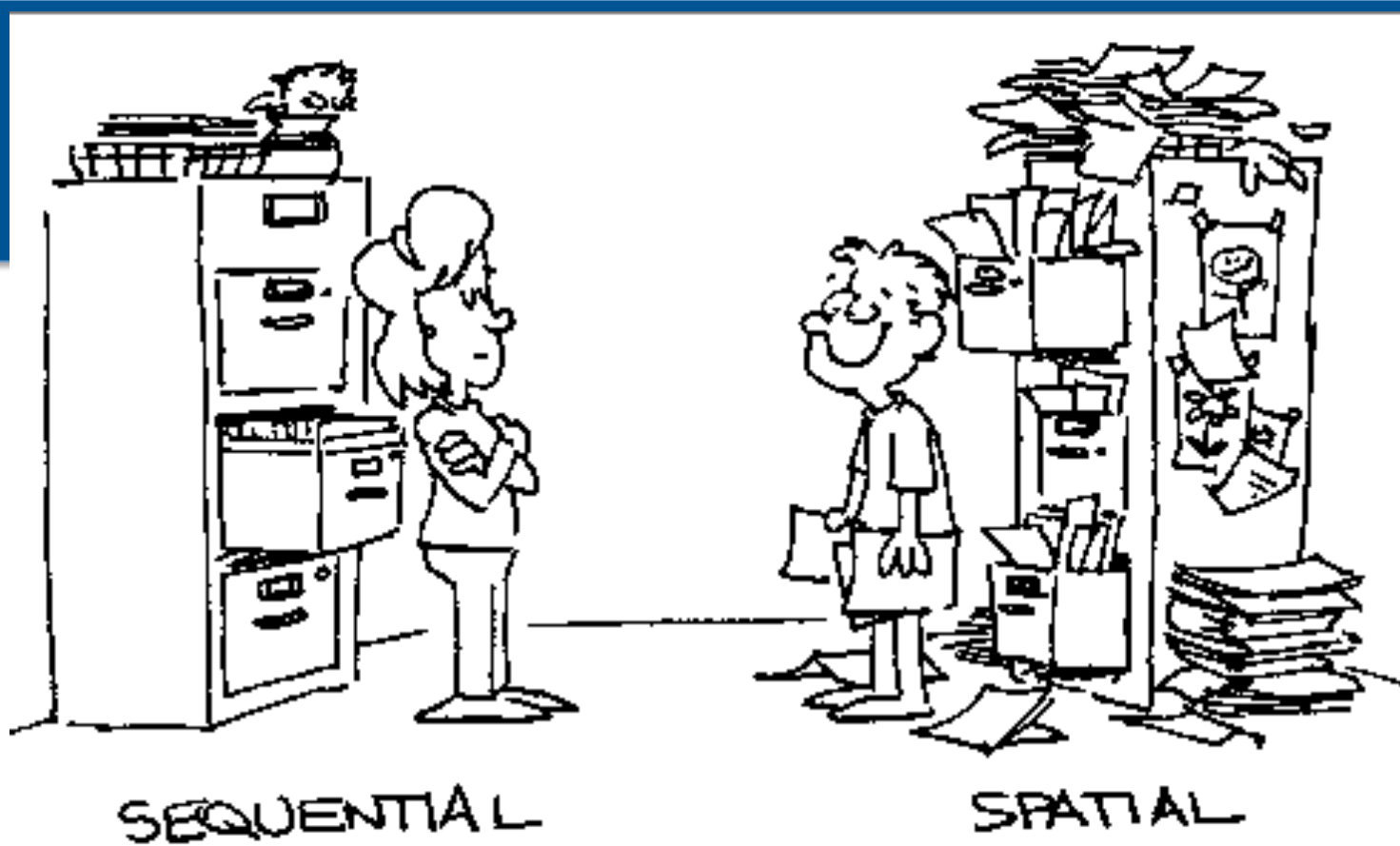
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# Agenda

- Creating a Common Language
- Quantifying Executive Functioning
- Intervention Strategies and Tools
- Developing and Measuring Competency



## Executive Functioning is a Skill

It follows a predictable developmental path and is tied closely to brain development.

# Creating a Common Language: Executive Functioning Defined

...those mental capacities necessary for formulating goals, planning how to achieve them, and carrying out the plans effectively.

(Lezak, 1982)

# Executive Functioning = CEO of the Brain

- Ensures things get done when they need to be done, how they need to be done, in a way that allows them to be retrievable, and that does not take too long.
- Makes sure things get done from the planning stages of the job to the final deadline.
- Issues with executive functioning can lead to challenges with any task that requires planning, organization, memory, time management, flexible thinking, and more.

(Morin, 2014)

# Manifestation of Executive Functioning Challenges

- Those facing executive functioning challenges may experience difficulty with the following tasks:
  - Keeping track of time
  - Making plans
  - Prioritizing work to be done
  - Beginning/finishing work on time
  - Multitasking
  - Applying previously learned information to solve problems
  - Analyzing ideas
  - Looking for help or more information when it is needed
  - Controlling emotions and outbursts
  - Maintaining focus

(Morin, 2014)

# Executive Skill Areas: Two Dimensions

## **Thinking (Cognition)**

- Planning & Prioritization
- Organization
- Time Management
- Working Memory
- Metacognition

## **Doing (Behavior)**

- Response Inhibition
- Emotional Control
- Sustained Attention
- Task Initiation
- Flexibility
- Goal Directed Persistence

The student can figure out how to save money for more expensive items.

The student finishes tasks within deadlines.

The student keeps track of daily schedule changes.

The student accurately rates his or her own work.

The student put items back in the appropriate place after use.

Planning & Prioritizing

The student can figure out how to save money for more expensive items.

Organization

The student put items back in the appropriate place after use.

Time Management

The student finishes tasks within deadlines.

Meta - Cognition

The student accurately rates his or her own work.

Working Memory

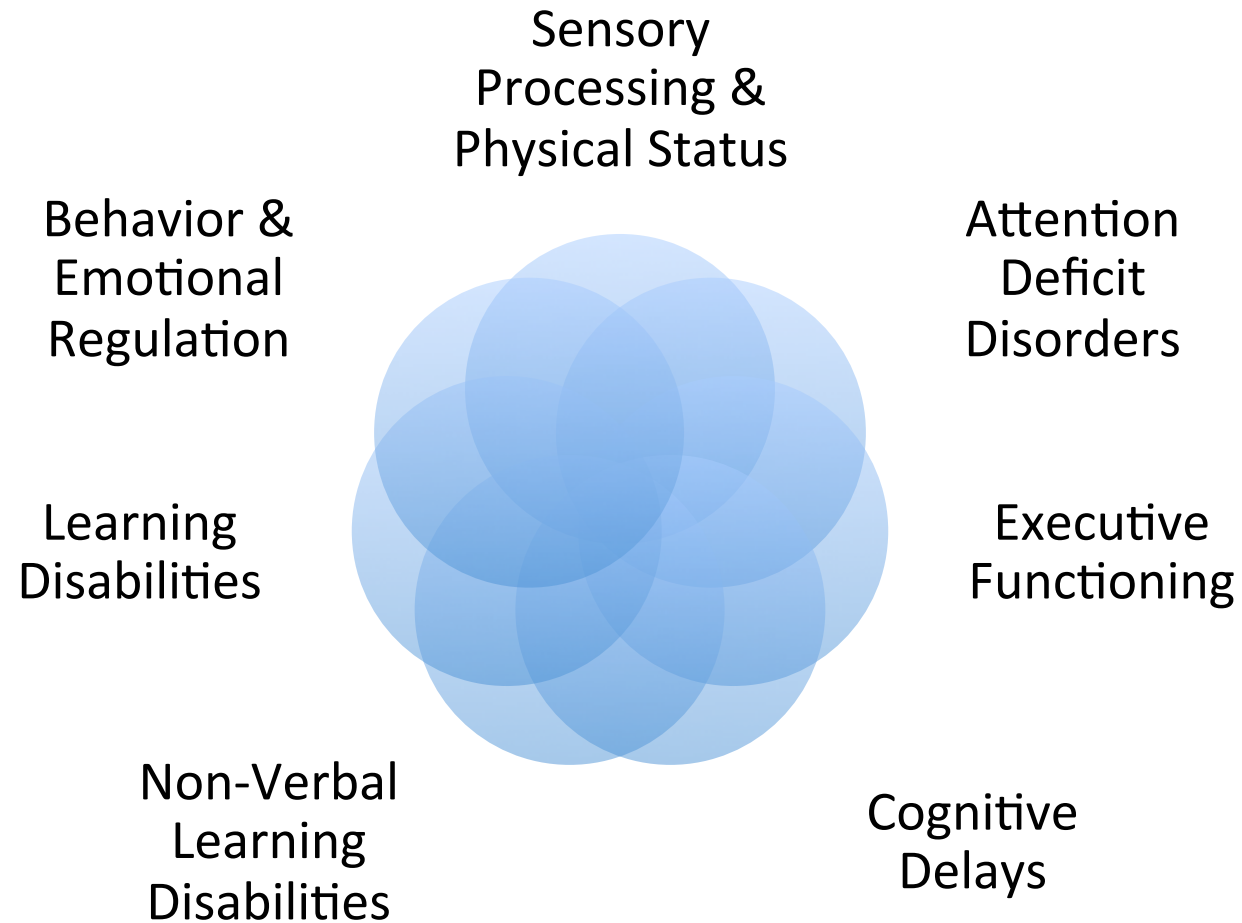
The student keeps track of daily schedule changes.



The student can stop a preferred activity to begin work.    The student can accept not getting what he/she wants.  
The student can work for 20 minutes without interruption.    The student resists saying hurtful things to friends.  
The student can adjust to different teachers and routines.    The student practices a skill without reminder.

Response Inhibition	The student resists saying hurtful things to friends.
Emotional Control	The student can accept not getting what he/she wants.
Task Initiation	The student can stop a preferred activity to begin work.
Goal Directed Persistence	The student practices a skill without reminder.
Sustained Attention	The student can work for 20 minutes without interruption.
Flexibility	The student can adjust to different teachers and routines.

# Overlapping Skills and Functioning



# Quantifying Executive Functioning

- Common Formal Tools
  - Behavior Rating Inventory of Executive Functioning
  - Behavior Assessment System for Children-2
- Lots of Informal Tools
  - Executive Skills Questionnaire
  - Onion Mountain Checklist
  - Homework Chain
  - Executive Function Situational Awareness Observation Tool

# Organizational Problems Inventory

- What is it?
  - An informal checklist to be completed by students, parents, and or teachers to identify areas of strength and weakness related to organization.
- What it is not...
  - A formal assessment or diagnostic assessment tool for organization.



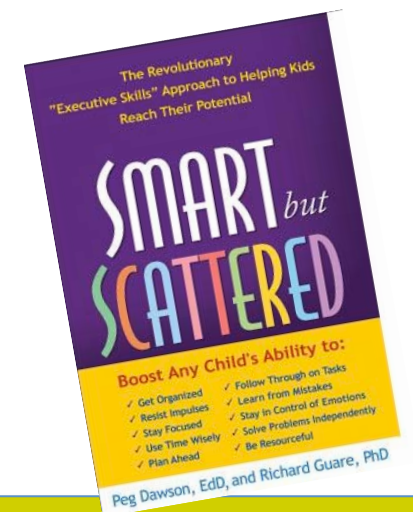
**Author: Judy Sweeney**



# Executive Skills Questionnaire

- What is it?
  - A student questionnaire designed to identify the strengths and weaknesses related to executive functioning.
- What it is not...
  - A formal assessment or diagnostic assessment tool for executive functioning.

Authors: Peg Dawson & Richard Guare



# Executive Skills Questionnaire

<b>Strongly Disagree</b>	<b>1</b>	<b>Tend to Agree</b>	<b>5</b>
<b>Disagree</b>	<b>2</b>	<b>Agree</b>	<b>6</b>
<b>Tend to Disagree</b>	<b>3</b>	<b>Strongly Agree</b>	<b>7</b>
<b>Neutral</b>	<b>4</b>		

<b>Item</b>	<b>Score</b>	<b>Total Score</b>
<b>1. I don't jump to conclusions.</b>		<b>X</b>
<b>2. I think before I speak.</b>		<b>X</b>
<b>3. I don't take action without having all the facts.</b>		<b>X</b>
	<b>X</b>	
<b>4. I have a good memory for facts, dates, and details.</b>		<b>X</b>
<b>5. I am very good at remembering the things I have committed to do.</b>		<b>X</b>
<b>6. I seldom need reminders to complete tasks.</b>		<b>X</b>

# Homework Chain

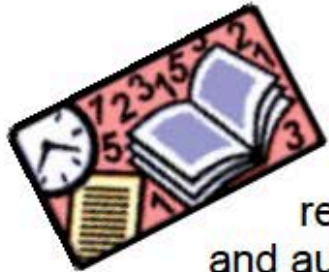
- What is it?
  - A guideline for discussing the process of completing homework with the goal of identifying strengths and weaknesses along the “chain”.
- What it is not...
  - A formal assessment or diagnostic assessment tool for organization.

Author: Dr. John F. Taylor



# Homework Chain

## The Homework Chain



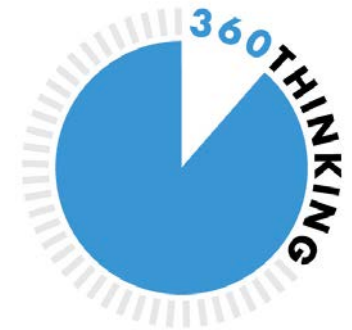
Doing one's homework may be more complicated than you thought! Many parents don't realize that there are many steps involved in doing homework. As ADD/ADHD workshop leader and author John F. Taylor, Ph.D. points out, a student must complete all of the following steps in order to successfully complete a homework assignment. Mr. Taylor calls this series of steps "The Homework Chain." Parents can help by identifying and improving weak links in the chain.

- 1) Realize an assignment is being given
- 2) Understand *what* the assignment is
- 3) Record the assignment accurately
- 4) Understand exactly *how to do* the assignment
- 5) Remember to bring the correct books or other materials home
- 6) Actually arrive at home with those materials (not leave at a friend's house, etc.)
- 7) Begin homework and complete it in a reasonable time



# Executive Functioning Situational Awareness Observation Tool

- What is it?
  - A checklist and rating scale that breakdowns “how to read the room” in terms of space, time, objects and people to plan for intervention.
- What it is not...
  - A formal assessment or diagnostic assessment tool.



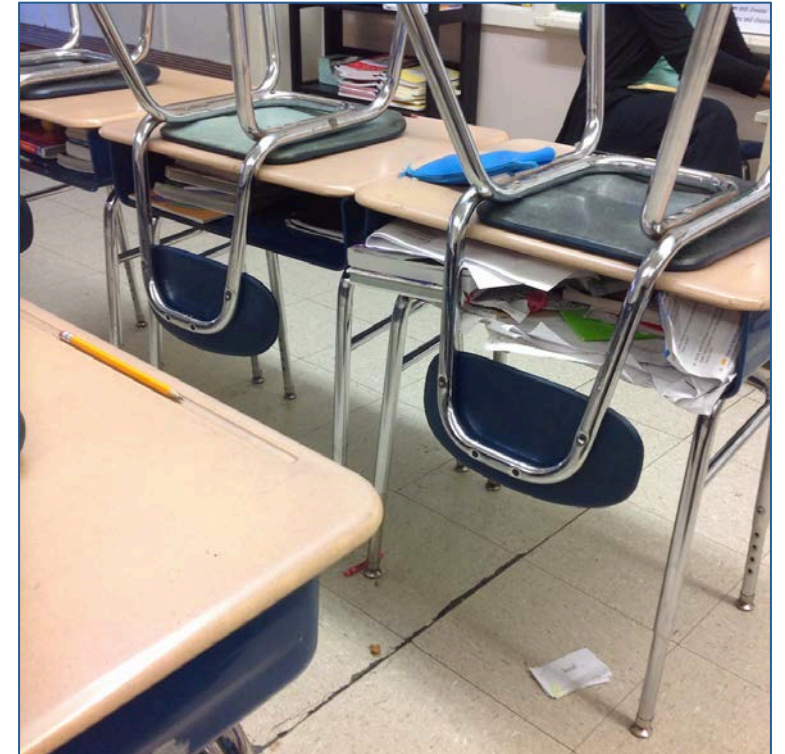
Author: Sarah Ward and Kristen Jacobsen

# Executive Functioning Situational Awareness Observation Tool

Space	Time	Objects	People
<ul style="list-style-type: none"> <li><input type="checkbox"/> Extracts : Reads The Room – Knows what’s going on</li> <li><input type="checkbox"/> Purpose: Understands the function of the Space for the situation</li> <li><input type="checkbox"/> Predicts: Navigates the space efficiently</li> <li><input type="checkbox"/> Flexibility: Can shift and transition between spaces</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Extracts: Knows the Time Demonstrates expected activity in specific time</li> <li><input type="checkbox"/> Purpose: Aware of kind of time and time available</li> <li><input type="checkbox"/> Predicts: uses If-then reasoning to envision future moment in time, has sequence of actions and time markers, and anticipates what is coming up</li> <li><input type="checkbox"/> Flexibility: Can shift Pace               <ul style="list-style-type: none"> <li><input type="checkbox"/> Reduced Initiation</li> <li><input type="checkbox"/> On pace</li> <li><input type="checkbox"/> Rushing</li> <li><input type="checkbox"/> Reduced Pace</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Extracts: Gathers all the expected materials/objects for given situation</li> <li><input type="checkbox"/> Purpose: Objects are organized within the personal space based on purpose of the task and functional use of the objects</li> <li><input type="checkbox"/> Predicts: Can recognize how same but different objects can be</li> <li><input type="checkbox"/> Flexibility: Sees the Necessities and relevancy of objects needed to meet a future goal and can inhibit use of objects that are not related to goal.</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Extracts: Recognizes Role for the given situation               <ul style="list-style-type: none"> <li><input type="checkbox"/> Own</li> <li><input type="checkbox"/> Other’s roles</li> </ul> </li> <li><input type="checkbox"/> Purpose: Recognizes and expresses the key purpose of communication exchanges</li> <li><input type="checkbox"/> Predicts: Makes inferences about communication and anticipates changes in situation based on communication from others</li> <li><input type="checkbox"/> Flexibility: Regulates</li> </ul>

# Beyond assessment tools...

- Consider the time of year/semester when looking at responses (everyone looks good the first week of the term)
- Look at the student's current tools:
  - Desk
  - Locker
  - Backpack
  - Agenda/Planner
- Observe in unstructured situations



# Before We Look at the Tools...A Reality Check

- These areas overlap and interact—
  - no matter how much we know about them and about the student's strengths and weaknesses related to them we cannot approach intervention sequentially nor wait for mastery before moving to another area.
- We have to organize the tasks and tools to align with the categories and make clear our expectations through explanation and discussion.
- Explicit and thorough teaching and modeling must take place for the tools and strategies to have a chance.

# Intervention Strategies and Technology Tools to Support Skill Related to Doing (Behavior)

○ = iOS app  
 ★ = Chrome App  
 ◆ = Website  
 □ = OSX App

Planning & Prioritizing	Calendars, reminders, step by step directions	<ul style="list-style-type: none"> <li>• Steps-Time Mapping★○</li> <li>• Covey Quadrants★○</li> <li>• myHomework○</li> </ul>	<ul style="list-style-type: none"> <li>• Digital Agenda★◆○□</li> <li>• Aida Reminder○</li> <li>• Remember the Milk○</li> </ul>
Organization	Visual checklists, graphic organizers, photo references	<ul style="list-style-type: none"> <li>• Google Calendar★◆○</li> <li>• Tools4Students○</li> <li>• SnapType○</li> </ul>	<ul style="list-style-type: none"> <li>• CardFlow○</li> <li>• Kidspiration★◆○□</li> <li>• Post-it Plus○</li> </ul>
Time Management	Timelines, timers, time tracking	<ul style="list-style-type: none"> <li>• 30/30○</li> <li>• Timer Loop★</li> <li>• Rescue Time□</li> </ul>	<ul style="list-style-type: none"> <li>• Timer★</li> <li>• T-Zero○</li> <li>• Forest: Stay Focused○</li> </ul>
Working Memory	Notes, recordings, flashcards	<ul style="list-style-type: none"> <li>• E-Wallet○□</li> <li>• MicNote★◆</li> <li>• Voice Memos○</li> </ul>	<ul style="list-style-type: none"> <li>• Notability○□</li> <li>• Notes○</li> </ul>
Metacognition	Reflections, rubrics	<ul style="list-style-type: none"> <li>• Study Skills Podcast○□</li> <li>• T-2 Mood Tracker○</li> </ul>	<ul style="list-style-type: none"> <li>• ChoiceMap○</li> <li>• Unstuck○</li> </ul>

# Intervention Strategies and Technology Tools to Support Skill Related to Doing (Behavior)

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Response Inhibition	Visual and/or auditory cues, behavior contracts & plans	<ul style="list-style-type: none"> <li>• Too Noisy<sup>○</sup></li> <li>• Today's Meet<sup>◆</sup></li> <li>• miTurn<sup>○</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Contingency Plans (in Skitch)<sup>○□</sup></li> </ul>
Emotional Control	Journaling, tracking, relaxation, meditation	<ul style="list-style-type: none"> <li>• Pottery<sup>○</sup></li> <li>• KidsYoga<sup>○</sup></li> <li>• Stop, Breathe, &amp; Think<sup>○</sup></li> </ul>	<ul style="list-style-type: none"> <li>• RelaxMe HD<sup>○</sup></li> <li>• Breath2Relax<sup>○</sup></li> <li>• OMG I Can Meditate<sup>○</sup></li> </ul>
Sustained Attention	Opportunities for practice	<ul style="list-style-type: none"> <li>• StayFocusd<sup>★</sup></li> <li>• Readabilty<sup>★◆○</sup></li> <li>• Safari<sup>○□</sup></li> </ul>	<ul style="list-style-type: none"> <li>• FindIt<sup>○</sup></li> <li>• ZZ Arrows<sup>○</sup></li> <li>• Memory &amp; Attention Free<sup>○</sup></li> </ul>
Task Initiation	Tools to help you get started	<ul style="list-style-type: none"> <li>• Pomodoro Timer<sup>★○</sup></li> <li>• Goal Reminder<sup>★</sup></li> <li>• Alarmed<sup>○</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Reminders from scheduling app<sup>★◆○□</sup></li> </ul>
Flexibility	Schedules, scripts	<ul style="list-style-type: none"> <li>• Flow Free<sup>○</sup></li> <li>• Brain Dots<sup>○</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Choiceworks<sup>○</sup></li> <li>• FTVS HD<sup>○</sup></li> </ul>
Goal Directed Persistence	Setting and tracking goals	<ul style="list-style-type: none"> <li>• Productive<sup>○</sup></li> <li>• Visual Schedules<sup>○</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Momentum<sup>★</sup></li> <li>• Clear<sup>○</sup></li> </ul>

# Rescue Time

this month  
month before

productivity pulse



48% Communication & Scheduling

34% Business

14% Utilities

2% Entertainment

1% Reference & Learning



# Rescue Time

Today  
before

productivity pulse



↓ 17% from day before

25% Uncategorized



19% Business



17% Communication & Scheduling



16% Entertainment



13% Utilities



# Developing Technology Competency

- Functional
  - Can the student complete the task?
- Operational
  - Can the student independently use the tool or strategy?
- Social
  - Can the student advocate for the tool or strategies?
- Strategic
  - Does the student know when to use a given strategy?
  - Does the student have (and use) a backup plan when there is a problem?