

## **Executive Functions & Learning Disabilities**

*[Image of LD@school logo.]*

*Text on screen: Executive Functions & Learning Disabilities.]*

*[Text on screen: This video will:*

- *Define executive functions*
- *Explain the relationship between executive functions and LDs*
- *Suggest teaching strategies.]*

This video will:

1. Define executive functions
2. Explain the relationship between executive functions and LDs
3. And suggest teaching strategies that educators can implement to help students succeed both in and out of the classroom

*[Text on screen: What are executive functions?*

*Image of a brain surrounded by the words: working memory, impulse control, emotional control, flexibility, organization, planning, focusing, task initiation and self monitoring.]*

In simple terms, executive functions are the mental processes that enable us to manage our behaviour. Executive functions are neurologically based skills that involve mental control and self-regulation. We use executive functions when we perform activities such as planning, organizing, strategizing, and remembering. Executive functions are not directly related to school subjects, but they are necessary in order to succeed in school and in daily life.

Executive function skills include:

- Working memory
- Impulse control
- Emotional Control
- Flexibility
- Organization
- Planning
- Focusing
- Task initiation
- And self-monitoring

*[Image on screen: a ruler to represent student's growth from the junior to intermediate level.]*

Difficulties associated with executive functions often manifest when students make the transition from the junior level to the intermediate level- when the expectations for independence and meeting deadlines are greater.

*[Text on screen: How do LDs and Executive Functions Relate?]*

*Executive functioning issues related to: ADHD, Mood disorders, and LDs*

*LDs a result of a deficit in executive functions.]*

Executive functioning issues are often related to conditions such as ADHD, mood disorders, and learning disabilities. Research in cognitive and neurological sciences has helped shape our understanding of learning disabilities, and plan appropriate intervention strategies. Many professionals attribute learning disabilities to be a result of a deficit in one or more of the executive functions listed earlier.

*[Text on screen: Case Study: Working memory]*

*Image on screen: a diagram of a brain labeled "Temporary Storage," "Focuses Attention," "Operates over a few seconds," and "Manipulates information," to demonstrate the functions of working memory.]*

Lets explore this idea further using the example of working memory. Approximately 70% of students with LDs in reading have low working memory scores, and they may struggle with following instructions, retaining and recalling information, and sequencing.

*[Image on screen: a girl with a thought bubble and a question mark, to represent the inability to recall information.]*

A student with low working memory will be unable to perform well on reading comprehension assignments, because they are simply unable to completely recall the key points and concepts. Understanding that the students' difficulties in reading comprehension is stemming from issues with working memory, allows an educator to implement the appropriate strategies to help the student overcome these difficulties.

*[Text on screen: Strategies for Educators:*

*Working memory:*

- *Repeating important information*
- *Using checklists and agendas*
- *Implementing classroom routines*
- *Allowing students to use memory aids,*
- *Providing extra time for tests and assignments.*

*Image on screen: Four pairs of hands trying to solve a puzzle.]*

Recent research on executive functions and LDs has allowed us to change the way we teach students with learning disabilities. Educators are faced with the task of identifying which executive functions a student may struggle with, and matching the appropriate strategies to the individual. Going back to our example, if a student struggles with working memory, an educator should provide the student with the tools to reduce the amount of information that needs to be remembered. This could be done through: repeating important information, encouraging the use of checklists and an agenda, implementing classroom routines, allowing students to use memory aids, and providing extra time for tests and assignments.

*[Text on screen: Strategies for Educators*

- *Reducing environmental distractions*
- *Simplifying verbal materials*
- *Pairing oral with visual instructions*
- *Encouraging students to self-advocate.]*

Other strategies include: reducing environmental distractions, simplifying the linguistic structures of verbal materials, pairing oral with visual instructions, and encouraging students to self-advocate when needed.

*[Text on screen: A student who uses his or her executive functions well will do better on schoolwork.*

*Image on screen: the profile of a boy working at his computer, surrounded by cogs, and academic materials such as books, pencils, and a globe. This image represents academic success.]*

A student who uses his or her executive functions well will do better on schoolwork. However, if the level of complexity increases, he or she may need help again to find more effective strategies. By differentiating instruction, and presenting a wide variety of strategies, educators can support their student's success, not only at school, but throughout the rest of their lives.

*[Image on screen: a whiteboard with the words "Thanks for watching," and the LD@school logo.]*

The next part of the module will cover literacy and learning disabilities.

Sources:

Understanding Executive Function and Learning Disabilities

<http://ldatschool.ca/executive-function/understanding-ef-and-lds/>

What Is Executive Functioning?

<http://www.ldonline.org/article/29122/>

Executive Function Fact Sheet

<http://www.ldonline.org/article/24880>

At a Glance: 8 Key Executive Functions

<https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/key-executive-functioning-skills-explained>

Understanding Executive Functioning Issues

<https://www.understood.org/en/learning-attention-issues/child-learning-disabilities/executive-functioning-issues/understanding-executive-functioning-issues>

Understanding Working Memory and Learning Disabilities

<http://ldatschool.ca/executive-function/understanding-working-memory-and-lds/>

Ask the Expert: How can I support my students with working memory difficulties?

<http://ldatschool.ca/executive-function/working-memory-difficulties/>