

The word "cerebrate" is written in a lowercase, sans-serif font. The letter 'e' is highlighted in a vibrant pink color. Above the 'e', there are three colorful, swirling lines in blue, green, and yellow, similar to the Lively Minds logo.

7 Components of Cerebrate

Executive Function System

1 Assessment

Why is ASSESSMENT important?

Assessment is critical to narrow in on specific student struggles and know exactly what strategies should be used for improvement. Educators are in a key setting for observing and assessing behaviors for improvement in a realistic context.

Who said so?

Peg Dawson, Ed.D., NCSP, a staff psychologist at the Center for Learning and Attention Disorders, has written multiple books and articles on executive skills. A few of her thoughts on ASSESSMENT include:

- "The reason for assessing executive skills is to understand the role executive skills may play in academic or behavior problems. In some cases executive skills are the primary reason for the problem at hand, while in other cases these skills are contributing factors."
- "Teaching a skill means operating directly on the behavior of concern..."
- "When designing interventions, understanding the role played by executive skills increases the likelihood that the intervention targets the appropriate behavior, thereby increasing the likelihood that the intervention will be successful."

All from Dr. Peg Dawson, 04/10/13, "Best Practices in Assessing and Improving Executive Skills," in *Best Practices in School Psychology*, The Charleston Group, Wakefield.

Gerard A. Giroia, PhD, et al. discuss the importance of ASSESSMENT with highlights from Dr. Mark Ylvisaker, a noted researcher in brain injury rehabilitation:

- “Mark Ylvisaker, has taught that ‘assessment that captures a child’s everyday functioning in the context of real-world demands is often more informative than traditional neuropsychological measures alone...’ Ylvisaker was a part of the movement that drove assessment and intervention out of the laboratory/clinic and into the real world.”
- “...identifying the key executive control behavioral strengths and challenges in the home and school contexts and measuring changes through intervention are essential.”
- “Assessment is an ongoing part of intervention. It provides feedback to the system regarding effectiveness of the intervention.”

All from Dr. Peg Dawson, 04/10/13, “Best Practices in Assessing and Improving Executive Skills,” in *Best Practices in School Psychology*, The Charleston Group, Wakefield.

Lynn Meltzer, PhD, President and Director of the Institutes for Learning and Development in Lexington, Massachusetts, and colleagues write on specific goals for ASSESSMENT:

- “The goals for assessment... are twofold: identification (or description) and prescription. The identification goal is focused on discovering and explaining what the student knows and can do, how the student learns and processes information, and why learning may be delayed (Meltzer, 2010)... The prescriptive goal of assessment is to provide specific recommendations for teaching strategies that closely match the student’s profile of strengths and weaknesses.”

From Lynn Meltzer, Julie Dunstan-Brewer, and Kalyani Krishnan, “Learning Differences in Executive Function: Understandings and Misunderstandings,” in *Executive Function in Education: From Theory to Practice*, 2018.

How does Lively Minds Institute incorporate ASSESSMENT into our curriculum?

The Cerebrate curriculum focuses on 64 specific executive function challenges within 8 areas. With hundreds of lessons, we focus attention on the development of necessary skills, and our unique lessons can be adapted for a single student or an entire classroom.

2 Motivation

Why is MOTIVATION important?

A student's desire and drive to improve are vital for success. Motivation can come from external rewards or even obligation, and sometimes those extrinsic methods provide the kick-start a student needs to apply him or herself. However intrinsic motivators like enjoyment, curiosity, or pride in accomplishments prove to help students with long-term learning and application of skills.

Who said so?

Richard M. Ryan, a clinical psychologist and professor at the Institute for Positive Psychology and Education at the Australian Catholic University, and Edward L. Deci, a Professor of Psychology at the University of Rochester, are co-founders of Self-Determination Theory (SDT), a motivational theory, assert this regarding MOTIVATION:

- SDT places its emphasis on people's inherent motivational propensities for learning and growing, and how they can be supported. Three needs are seen as particularly fundamental: [autonomy, competence and relatedness....] Autonomy concerns a sense of initiative and ownership in one's actions.... Competence concerns the feeling of mastery, a sense that one can succeed and grow.... [R]elatedness concerns a sense of belonging and connection."
- "...psychological variables such as interest and value play a significant role in engagement and learning."

Both from Richard M. Ryan and Edward L. Deci, "Intrinsic and Extrinsic Motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions," in *Contemporary Educational Psychology*, 04/08/2020, <https://doi.org/10.1016/j.cedpsych.2020.101860>.

Tim Klein, project lead for the True North Project at Boston College and an award winning urban educator, clinical therapist, school counselor and writer summarizes the work of Ryan and Deci, specifically related to intrinsic MOTIVATION:

- “Decades of research, led by Richard Ryan and Edward Deci, have shown that students work harder, learn more and are much more likely to thrive in school when they are intrinsically motivated and self-determined.”

From Tim Klein, “**Grades Fail at Motivating Students. Intrinsic Motivation Works Better.**” 5/21/20, on edsurg.com/news.

Lynn Meltzer, PhD, and colleagues propose guiding principles “critical for students with learning differences who display weaknesses in EF processes,” and have this to say about MOTIVATION:

- “Address students’ motivation and willingness to use strategies so that generalization of strategy use occurs across tasks and settings.”

From Lynn Meltzer, Julie Dunstan-Brewer, and Kalyani Krishnan, “**Learning Differences in Executive Function: Understandings and Misunderstandings,**” in *Executive Function in Education: From Theory to Practice*, 2018.

Peg Dawson, Ed.D., NCSP, from the Center for Learning and Attention Disorders, has written multiple books and articles on executive skills. On MOTIVATION, she declares:

- “...the child must be targeted directly, either by teaching the child the weak skill or providing motivation for the child to practice the weak skill to make it stronger.”

From Dr. Peg Dawson, 04/10/13, “**Best Practices in Assessing and Improving Executive Skills,**” in *Best Practices in School Psychology*, The Charleston Group, Wakefield.

Harriet Greenstone, a psychologist and director of a multidisciplinary care center in Montreal, touches on some of the reasons MOTIVATION can be so important to keep in mind:

- “It is critically important for students to (a) understand their own strengths and weaknesses, and (b) see that these strategies will lead to improved grades. Without either component, they are unlikely to use them. Step (a) can be challenging, when dealing with a student who has experienced years of failure and frustration and might be emotionally fragile. It is best accomplished in private discussions, with equal emphasis on both strengths and weaknesses, delivered in a clearly supportive, non-judgmental manner. A good approach to Step (b) would be to break down tasks or assignments into small, accomplishable units, so the students can experience successes and build on them.”

From Harriet Greenstone, “Executive Function in the Classroom: Neurological Implications for Classroom Intervention,” *LEARNing Landscapes*, Vol. 5, No. 1, Autumn 2011.

How does Lively Minds Institute incorporate **MOTIVATION** into our curriculum?

Our lessons promote that students take ownership of their development while recognizing their individual accomplishments and growth. We direct students to consider their individual strengths and weaknesses as they develop targeted skills while also providing challenges and opportunities to persist, so students feel and see their work’s inherent value.

3 Collaboration

Why is **COLLABORATION** important?

There’s an old adage: “You catch more flies with honey than vinegar.” While Lively Minds does not think of students as “flies,” this saying makes a valuable point. The honey is represented by our collaboration, or partnership, with students, while the vinegar would be demanding or dictating a student’s outcomes. Clearly, collaboration with students wins when addressing executive function struggles, and is not only helpful, but also necessary for students to develop self-awareness and problem-solving skills as we work toward improvement.

Who said so?

Dr. Ross W. Greene, a clinical child psychologist, developed the Collaborative & Proactive Solutions (CPS) intervention model that is a “compassionate, productive, effective, approach to understanding and helping behaviorally challenged kids.”* With widely published research, Dr. Greene has focused on collaborative problem-solving with children, teens, and adults. As an expert on using COLLABORATION, he has had this to say:

- “Kids do respect adults who have reasonable expectations, listen to their concerns, treat them with mutual respect, and work toward finding mutually satisfactory solutions.”

Both from Richard M. Ryan and Edward L. Deci, “Intrinsic and Extrinsic Motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions,” in *Contemporary Educational Psychology*, 04/08/2020, <https://doi.org/10.1016/j.cedpsych.2020.101860>.

- Elizabeth Keller, a student at the University of Dayton, cited the work of Dr. Peg Dawson, a staff psychologist at the Center for Learning and Attention Disorders, and Dr. Richard Guare, Director of the Center for Learning and Attention Disorders, speaking of COLLABORATION in their coaching model:
- “Peg Dawson and Richard Guare (2013) developed a ‘coaching’ model, in which students are ‘coached’ in order to learn executive skills. They compare teaching these skills to the way a team coach works with athletes. Coaching allows the clients to manage their attention, hyperactivity, and impulsivity through a collaborative, goal-oriented process (Ahmann et al., 2017). The coach works with the student to identify potential obstacles and how to overcome them. The coach will help the student identify specific EF deficits, and explain how to practice these skills daily.”

From Elizabeth Keller, “Executive Functioning Intervention for Middle School Students with Attention-Deficit/Hyperactivity Disorder,” 08/2019, University of Dayton, copyright 2019.

How does Lively Minds Institute incorporate **COLLABORATION** into our curriculum?

Our Cerebrate curriculum empowers students to develop awareness and confidence as they learn. Lessons are structured to encourage students to listen actively, ask questions and think critically, and evaluate their progress reflectively while building strong habits through practice.

4 Engagement

Why is **ENGAGEMENT** important?

Engagement and Motivation are closely linked when educators teach EF skills. Providing a variety of activities, questions, and opportunities to express themselves allows EF challenged students to maintain focus, think critically, stay motivated, and invest in significant learning experiences. Engagement is critical to the “how” when we approach executive function training.

Who said so?

Research from experts in neuroscience and executive functioning, **Drs. Zelazo, Blair and Willoughby**, offers details on how **ENGAGEMENT** is significant in obtaining EF skills:

- “Like other skills, EF skills are acquired largely as a function of experience, or practice: the repeated engagement and use of EF skills in problem solving strengthens these skills, increases the efficiency of the corresponding neural circuitry, and increases the likelihood that the skills will be activated in the future...”
- “A growing body of intervention studies has established that the acquisition of EF skills can be enhanced through repeated practice in the process of reflecting upon and using specific EF skills. This research suggests that it is important to keep children motivated to practice EF skills and to challenge those skills continually using a graduated series of exercises that vary in difficulty.”

- “Mindfulness involves sustained, focused attention on moment-to-moment experience. A number of studies, most with adults, indicate that repeated engagement in mindfulness practices (e.g., paying attention to one’s breathing and gently redirecting attention back to one’s breathing when the mind wanders) improves performance on measures of EF and emotion regulation.”

From P.D. Zelazo, Clancy B. Blair, and Michael T. Willoughby, “Executive Function: Implications for Education,” 2016, for the National Center for Education Research, Institute of Education Sciences.

Dr. Norman Doidge, FRCPC, a psychiatrist and psychoanalyst, provides information on how the brain responds to ENGAGEMENT:

- “We now know that the right exercises and activities can build new circuitry in the brain, and strengthen areas of identified weaknesses. Essentially, the brain can learn to bypass neural pathways that aren’t working and build new ones—not just in childhood, but through adolescence and even adulthood.

Doidge, N. (2007). *The Brain that Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science*. New York: Viking Adult.

How does Lively Minds Institute incorporate ENGAGEMENT into our curriculum?

The objectives of our lessons encourage students to think, reflect and respond critically as they learn skills. An inherent piece is for students to stay engaged with a variety of adaptable lessons, so they can learn actively.

5 Application

Why is APPLICATION important?

Application is watching what we is taught function in live, realistic environments. When working with students struggling with executive function skills it becomes all that more important to provide opportunities for use, and it is exciting to witness a student’s growth and success.

Who said so?

Harriet Greenstone, a psychologist and director of a multidisciplinary care center in Montreal, makes this statement after listing examples of strategies that can be used for all students in a classroom. The examples she provided included task analysis checklists, memory aids, and breaking down projects into manageable “chunks.” Her statement speaks directly to APPLICATION:

- “These types of strategies have important implications even beyond the academic years. They encourage self-reliance and self-knowledge skills which would benefit any student, and should be applied in all classes, so they may begin to be generalized.”

From Harriet Greenstone, “Executive Function in the Classroom: Neurological Implications for Classroom Intervention,” *LEARNing Landscapes*, Vol. 5, No. 1, Autumn 2011.

Dr. Jerome Schultz, a member of ADDitude Magazine’s ADHD Medical Review Panel, stresses the importance of APPLICATION:

- We have to teach kids what EF skills are, and we have to give them the chance to practice these skills. Unless we ask kids to apply these skills in learning to get a feel for what it’s like when EF is working, their brains will go into fight-or-flight mode. No one learns anything when that escape alarm goes off. It’s survival biology. Kids have to believe they will be successful for the EF training to become internalized and automatic.

From <https://www.additudemag.com/executive-function-for-kids/> by Jerome Schultz, PhD, “It’s Easy to Hover Over a Child with Executive Function Deficits. Don’t,” 5/5/20.

Researchers in the field of executive function assessment and training, provide this insight to APPLICATION:

- “In structuring an executive function intervention, we advocate the use of everyday executive routines in a meaningful, real-world everyday context. Many students with executive function difficulties do not yet possess the internalized routines needed for well-regulated problem solving. Therefore, intervention often begins from an external support position with active modeling, coaching, and guidance by important everyday people, which gradually transitions into an internal process as the direct coaching and cuing is faded. The general intervention process includes the following: “ Externally model multistep problem-solving (i.e., executive) routines. “ Externally guide with the development of everyday executive routines. “ Practice using executive routines in everyday situations. “ Fade external support and cue internal generation and use of executive routines. “ Coach for generalization to new situations or new coaches. “ Provide feedback throughout the process.

From Peter K. Isquith, PhD, Gerard A. Gioia, PhD, Steven C. Guy, PhD, Lauren Kenworthy, PhD, and PAR Staff, Parent Form Interpretive Report, copyright 02/12/2015.

Dr. Lynn Meltzer can colleagues explain the necessity of APPLICATION when teaching executive function strategies:

- “...students need to learn that hard work and use of effective strategies will help them bypass the impact of their learning difficulties so that they can show what they know in the classroom and on tests. Strategies help students learn how to learn and to recognize the important phases in the learning process as steps toward their goals.”
- “Teach students how, when, and why, specific strategies can be successfully used for different academic tasks.”

From Lynn Meltzer, Julie Dunstan-Brewer, and Kalyani Krishnan, “Learning Differences in Executive Function: Understandings and Misunderstandings,” in *Executive Function in Education: From Theory to Practice*, 2018.

Again we hear from **Dr. Gioia** in collaboration with colleagues, summarizing APPLICATION:

- ...interventions that improve functioning in the real-world environment are most useful.

From Gerard A. Gioia, PhD; Lauren Kenworthy, PhD; Peter K. Isquith, PhD, "Executive Function in the Real World: BRIEF Lessons from Mark Ylvisaker," in *Journal of Head Trauma Rehabilitation*, Wolters Kluwer Health, Lippincott Williams & Wilkins, copyright 2010.

How does Lively Minds Institute incorporate APPLICATION into our curriculum?

Our curriculum can be applied in various learning environments and in real-life situations. Students are equipped to associate specific skills to their own circumstances by establishing independent academic and personal goals and by developing habits and routines meaningful to their lives.

6 Instruction

Why is INSTRUCTION important?

Because executive functions skills often require close-attention to habits, teaching these skills with a straight-forward, direct approach and repetitive practice proves to be most effective. In addition, students should be provided opportunities to self-reflect and assist in monitoring their own progress in growing these skills.

Who said so?

Dr. Peg Dawson from the Center for Learning and Attention Disorders, has written multiple books and articles on executive skills. On the topic of INSTRUCTION, she states:

- "Direct instruction in executive skill strategies has... been shown to be effective within the context of academic skills...."

All from Dr. Peg Dawson, 04/10/13, "Best Practices in Assessing and Improving Executive Skills," in *Best Practices in School Psychology*, The Charleston Group, Wakefield.

Dr. Lynn Meltzer on the subject of INSTRUCTION:

- EF Training... involves teaching a student EF skills until he masters them... In her book *Promoting Executive Function in the Classroom*, Lynn Meltzer, Ph.D., recommends: attending to detail; repetition, rehearsal, and review; attaching meaning; and grouping bits of information.

From Lynn Meltzer, PhD, *Promoting Executive Function in the Classroom*, 2010, The Guilford Press.

These **experts** on developmental psychology collaborated on a research project for the National Center for Education Research in 2016 and had this to say on INSTRUCTION of executive functions:

"...research suggests that even very brief (15 minute) interventions targeting high-level skills like reflection and cognitive flexibility are effective."

"...the literature on the malleability of EF suggests that training can lead to improvements in performance on the trained tasks, as well as corresponding changes in the brain."

From P.D. Zelazo, Clancy B. Blair, and Michael T. Willoughby, "Executive Function: Implications for Education," 2016, for the National Center for Education Research, Institute of Education Sciences.

How does Lively Minds Institute incorporate INSTRUCTION into our curriculum?

Cerebrate lessons contain strategies to be taught and reviewed with students for development of necessary skills in 8 executive function areas – Self-Control, Self-Monitor, Emotional Control, Flexibility, Task Initiation, Working Memory and Attention, Planning and Time Management, and Organization. Lessons provide opportunities for students to set goals with detailed guidance from educators and for monitoring progress as students practice skills.

7 Metacognition

Why is METACOGNITION important?

For anyone with executive function challenges, awareness of specific struggles as well as when and how to use particular strategies become essential to learning necessary skills. For example, if a student is aware of what distractions keep him from focusing on homework, he can know how to adapt his environment once he is guided through and practices techniques. The student's participation in his own growth and self-reflection enable him to respond more independently and practically.

Who said so?

Professors of Psychology, **Hofmann, Schmeichel**, and **Baddeley**, asserted this about METACOGNITION related to executive function skills:

- "To think metacognitively, it is important to hold goals in working memory, inhibit behaviors that don't help for the current task, and shift attention when adapting strategy - these are all key executive functions."

From Hofmann, W., Schmeichel, B. J., & Baddeley, A. D. (2012). "Executive Functions and Self-Regulation." *Trends in Cognitive Sciences*, pp. 16, 174-180.

Several renowned experts, including **Dr. Gerard A. Gioia**, the Division Chief of Neuropsychology and the director of the Safe Concussion Outcome, Recovery & Education (SCORE) Program at Children's National Hospital in Washington D.C, provide this input on the goal of interventions, that speaks directly to METACOGNITION:

- "The student should become increasingly more active in formulating and carrying out the plans and reviewing his performance, thus promoting internal executive control. The goal of executive function intervention is maximal independence, which necessitates the active involvement of the student in each phase via a coaching model."

From Peter K. Isquith, PhD, Gerard A. Gioia, PhD, Steven C. Guy, PhD, Lauren Kenworthy, PhD, and PAR Staff, *Parent Form Interpretive Report*, copyright 02/12/2015.

Drs. Meltzer, Pollica, Barzillai explain how METACOGNITION can be taught:

- “Metacognitive strategies should be taught explicitly—using very literal and concrete terms, and including frequent modeling and repetition. It is important to also teach the students exactly how each strategy will help them....”

From Meltzer, L., Pollica, L.S., & Barzillai, M. (2007). *Executive Function in the Classroom: Embedding strategy instruction into daily teaching practices*. in L. Meltzer (Ed.), *Executive Function in Education: From Theory to Practice* (pp. 165-193). New York: Guilford Press.

Dr. Jerome Schultz, a member of ADDitude Magazine’s ADHD Medical Review Panel, summarizes how METACOGNITION can actually look when taught:

- “Students are expected to take more responsibility for predicting the need for EF-enhancing strategies that eliminate or reduce roadblocks to learning. After completing work successfully, students should be able to state the relation between the strategy they employed and the positive outcome.”

From <https://www.additudemag.com/executive-function-for-kids/> by Jerome Schultz, PhD, “It’s Easy to Hover Over a Child with Executive Function Deficits. Don’t,” 5/5/20.

Again we hear from **Dr. Lynn Meltzer** and colleagues on METACOGNITION:

- “Metacognitive awareness... boosts students’ motivation to master and use these strategies in their daily classwork and homework so that their academic performance improves beyond a single task.”
- Meltzer, et al. propose several guiding principles “critical for students with learning differences who display weaknesses in EF processes,” including, “Promote metacognitive awareness and self-understanding in students explicitly and emphasize that students have different profiles of strengths and weaknesses.

From Lynn Meltzer, Julie Dunstan-Brewer, and Kalyani Krishnan, “Learning Differences in Executive Function: Understandings and Misunderstandings,” in *Executive Function in Education: From Theory to Practice*, 2018.

How does Lively Minds Institute incorporate METACOGNITION into our curriculum?

With over 200 unique lessons by grade level, we provide multiple chances for students to consider how they learn, what works best in what environments or circumstances, as well as to become increasingly self-aware while establishing routines, goals, and habits they are invested and interested in.