Evolved Education INTEGRATED EXECUTIVE FUNCTION COACHING MODEL

BY: MARY MIELE

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Integrated Executive Functioning Model

Evolved Education Company

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Introduction to This Book and Methodology

I've always been fascinated with the learning process. During my career, I have worked with students from two years of age through college on helping them to learn well, and I have worked with adults to ensure they can function well at work and in their adult lives. I became curious about executive functioning in particular, as it affects so much for my clients.

Sometimes a major problem and other times a subtle weakness, a lack of strength with executive functioning cause so much pain for so many of my school-aged students and adult students. I want to ease this pain, and so initially, I did what most of us in our field do - I Googled it. What I found was an array of resources from Understood.com and Drs. Peg Dawson and Richard Guare's popular book Smart Yet Scattered. I enrolled in the SMARTS training. And yet, even with an understanding of executive functioning from these fine sources, I struggled to develop a coaching program with our students and adults that would move the needle - or have "far transference" as the researchers call it. In other words, I was seeking a way for me to coach so that when I did, students would build functioning that they would take and use on their own within various contexts of their lives.

It seemed for a while at least that I would coach executive functioning and students would still constantly need support. It wasn't just me. All around town, we received calls into our office about students who had invested in executive function coaching who continued to struggle with functioning. They had supposedly learned to organize their files, plan their assignments, and make to-do lists, but no one was independently functioning any better than before.

Just after the height of the pandemic in late 2020, I decided to invest in some learning of my own. Each week I would take it upon myself to read research articles. I followed some of the "greats" in the executive functioning field such as Clancy B. Blair, Stephanie M. Carlson, Adele Diamond, Kimberly Adams Espy, Megan M. McClelland, Michael T. Willoughby, and Philip David Zelazo. I tried to focus my reading on research published in the 2000s, but sometimes the earlier articles would excite me, even if only to learn just how far we've progressed.

I quickly came across a fabulous document written by Philip David Zelazo, Clancy B. Blair, and Michael T. Willoughby. Everyone reading this publication should at least read

the summaries of each of the chapters of this exquisite paper. This document confirmed a lot of what I had already read in research articles. In addition, it showed me where I needed to work and where I did not. I am excited to share my findings with you in the next few pages of this book.

However, I decided not to conclude with this report on executive functioning research available to our field in the 2020s (as exciting as it all might be), but rather, I would take that knowledge and synthesize it with other learning research as well as professional experience to create a method for Executive Function Coaching.

I have springboarded a practical process that I call "Evolved Education's Integrated Executive Function Coaching Model." Simply put, this method integrates not only executive functioning and cognitive psychology academic research but also integrates the student's learning experiences, assessment, as well as strategies taught. Since it aligns with academic research and leaves room for new research to affect it, I believe this model can evolve with us as our field continues to develop. Maybe more branches will form, but the foundation here is strong and I am excited to see where it takes my students, the students at Evolved Education, and your students!

The model involves four main pillars. I will go into great detail later in this publication on each of them, and I list them here just to whet your palate!

Academic Research
Areas of Inquiry and Instruction
Assessment
Strategy Instruction and Skill Mastery

Further research on this method needs to be examined, of course. As such, I invite each professional reading this to keep records of their implementation and progress. I intend to evolve as we learn more about our students and their experiences as well as the ways we can help them to function at their best. Even more, we can use the four pillars of this method and continue to evolve them as we go forward.

What is Executive Functioning?

Executive Functioning is cognitive flexibility, working memory, and inhibition. These functions are carried out primarily in the frontal cortex of the brain. They are developed from birth through young adulthood.

Cognitive Flexibility

Cognitive Flexibility is the process of thinking about something in many different ways. We use cognitive flexibility often in learning as we consider various perspectives as we read. We also use it in problem-solving for Math and Science. In writing, we may also explain an idea using various forms of evidence and change our minds as we communicate.

Working Memory

Working Memory involves keeping the information in mind while manipulating it in a few ways. We use working memory when we read as we have to hold different pieces of information together to consider it as a whole picture or story. As we write, we have to keep our ideas in mind and connect them as we transcribe. In math, mental calculations as well as holding directions in mind and using them all involve working memory. A person's working memory is measured on a type of continuum, from small to large. We can think of it as being a Post-It note; some people have a 3 by 3 Post-It note and others may have a 4 by 6 Post-It note and so on.

Inhibitory Control

Inhibitory control is a person's ability to intentionally suppress attention, ignore a distraction, stop an impulsive action, and/or overcome a routine or action that is highly learned.

Executive functioning is essential for making predictions, identifying patterns, and drawing logical conclusions.

Correlations

Many times, I have seen executive functioning confused with self-regulation and metacognition. Although executive functioning is a part of these areas of competence, self-regulation and metacognition are not solely affected by executive functioning.

Executive functioning skills are involved in self-regulation only when self-regulation is conscious and deliberate - where people modify their behaviors intentionally to achieve a goal.

Executive functioning is affected by temperament and personality such as effortful control, conscientiousness, openness, and grit. It is also affected by self-control, reflective learning, deliberate problem solving, emotional regulation, persistence, and planning.

Thus, it stands to conclude that to support students to build executive functioning, we should consider temperament, personality, and behavior in addition to executive functioning.

What does Does Academic Research tell us About Executive Functioning?

Using Executive Functioning Increases Executive Functioning.

Executive functioning skills are acquired largely as a function of experience, or practice: the repeated engagement and use of executive functioning skills in problem-solving strengthen these skills, increase the efficiency of the corresponding neural circuitry, and increase the likelihood that the skills will be achieved in the future. (Zelazo and Lee 2010)

Temperament and Personality Affect Executive Functioning.

If you have high effortful control, high conscientiousness, openness to experience, and high self-discipline, you can display EF skills without innately having a strong EF. (Duckworth and Seligman 2005)

Executive Functioning is Not a Stand-Alone Brain Function.

Executive Functioning overlaps with reasoning skills or fluid intelligence. (Ackermaan, Beier and Boyle 2005; Kane, Hambrick and Conway 2005)

Emotions Affect our Use of Executive Functions.

High levels of stress negatively impact our ability to access executive functions. Emotions affect our use of Executive Functioning (stress, and emotions will either positively or negatively influence EF), it is difficult to put Executive Functioning skills into place when a person is stressed, tired or bored). Small amounts of stress or positive emotion help Executive Functioning. (Blaire 2014, Blair and Ursache 2011)

Researchers Divide Executive Functioning into Cold and Hot Categories.

Cold executive functioning involves the process we operate in more effectively neutral contexts such as the ones we use while thinking: metacognition, cognitive flexibility, inhibition, attention, working memory, and problem-solving. Hot executive functioning involves behaviors and emotional regulation as well as decision making, social skills, insight, and empathy (theory of mind). (Chavez-Arnana et. al) Both hot and cold executive functioning influence a child's overall functioning. (Zelazo & Carlson 2012)

Brain Functioning Affects Executive Functioning.

Executive Functioning occurs in the Frontal Lobe of the brain. (D'Esposito and Postel 2015)

Neurotransmitters and hormones have a lot to do with working memory, but when stress is high, the increased levels of hormones do not help, but rather, hinder. (Yerkes and Dodson 1908)

Chemicals of dopamine, norepinephrine as well as glucocorticoid hormone cortisol increase neural activity in the Pre-frontal Cortext (PFC). This helps the brain to be

readily engaged and facilitates Executive Functioning. This happens when we have well-structured experiences in the classroom, order, stimulation is in a moderate range.

However when the system is over-stressed, the classroom is disorganized, and there is a lot of stress - the PFC is reduced and it is hard to access Executive Functioning. (Armsten 2009)

Development Affects Executive Functioning.

John Best is doing interesting research on school-aged children and the development of Executive Functioning. His article, published in 2009 states, "the relations among the EF components, particularly as they are recruited for complex tasks, appear to change throughout development." (Best et. al 2009)

Adolescents have a well-developed emotional reactivity system and a relatively immature prefrontal cortical system associated with Executive Functioning skills. (Casey et. Al. 2008, Crone and Dahl 2012; Ernst 2014; Steinberg 2010)

The Pre-frontal Cortex continues to develop through mid-adulthood. (Zelazo et. al 2013, 2014)

EF has the most dramatic growth between the ages of 2 to 6 years of age, and then the PFC reorganizes itself during adolescence.

There is a correlation between the Theory of Mind and executive functioning. (Sabbagh et. al 2006)

There needs to be more research to categorically understand how Executive Functioning grows as related to child development, but there does seem to be evidence to support the notion of the 2-6 growth areas and adolescent growth areas as well as a building of sophistication of Executive Functioning throughout a child's development.

Executive Functioning is Affected by Academic Achievement.

Improving Executive Functioning skills improves math and reading. (Raver et.al. 2011)

Improving math and reading language skills improves Executive Functioning skills. (Welland and Yoshikawa 2013)

A meta-analysis of self-regulation strategies showed large effects on math. (Dignath, Buettner and Langfeldt 2008)

Researched-Methods of Assessment.

There is not yet a “gold standard” for assessing Executive Functioning, but there are some researched methods of assessment available.

A performance-based task measures optimal cognitive ability in highly structured testing environments, whereas questionnaires measure behavior in everyday contexts. Whether to use one or the other should be based on the objectives of the assessment (e.g. — is it behavioral or cognitive).

We have to be careful to use the questionnaires to uncover executive functioning skills, rather than behaviors that are multi-dimensional.

Questionnaires can be useful for treatment planning. (Isquith, Roth, and Gioa 2013, Isquith et. Al. 2014)

There is a difference between what parents and students report about executive functioning. (Soriano-Ferrer et. al 2018)

What does Academic Research Tell us About How Students Learn Well?

We Use Methods Adopted by Our Field to Support Effective Learning Experiences and Outcomes.

1. Students' **prior knowledge** can help or hinder learning.
2. How students **organize knowledge** influences how they learn and apply what they know.
3. Students' **motivatio**n determines, directs, and sustains what they do to learn.

4. **Goal-directed practice** coupled with **targeted feedback** enhances the quality of students' learning.
5. To develop mastery, students must **acquire component skills**, **practice integrating them**, and **know when to apply them.**
6. The student's **current level of development interacts with the social, emotional, and intellectual climate of the course to impact learning**.
7. To become **self-directed learners**, students must learn to **monitor and adjust** their **approaches to learning**.

(Ambrose 2010)

Learning Strategies Increase Successful Learning Outcomes.

There is a strong correlation between learning strategies and successful learning outcomes. (Angel-González et. al 2017)

A learning strategy is a procedure that involves intentional decision-making to choose an intended course of action to meet the expectation or goal involved in the educational situation or learning activity.

Contextual Learning is an Impactful Process.

When I read, Understanding How We Learn by Weinstein et. al, I was excited to confirm that my students would retain a learning strategy when it was learned within a meaningful context.

Memory is reconstructed each time. Thus, when a student goes into their brains to retrieve a learning strategy, they will have success when that strategy is tied to an experience - in this way, as they construct the strategy, there will be less of an opportunity for it to be constructed incorrectly.

Consolidation is Key to Transferring a Short Term Memory into a Long Term Memory.

For a learning strategy to "stick in mind," it first has to be encoded in a deep or meaningful way. Connections to the learning strategy are essential for memory purposes.

Long-term memory involves encoding, consolidation, storage, and retrieval. (Nader & Hardt 2009). When the brain learns something, neurons connect. And as these neural connections become stronger neuropathways and eventually something called "engrams." For instance, you might think of the word, "ice cream." Many different associations and experiences come to your mind. The collective memory you create is formed because of engrams. (Tonegawa, Liu, Ramirez & Redondo 2015) As we continue to recollect a learning strategy, we turn it into very strong long-term memories, this is because consolidation continues to occur each time we recall the strategy.

Review of Learning Strategies Over Time Allows for Long-Term Retention

If the goal is to retain information over time, then it is important to review the material or process over a few weeks. (Cepeda et al., 2008).

Examples, Exemplars Support Strong Learning Outcomes

Providing students with more than one example is helpful to build understanding. (Bauerschmidt 2017)

Engaging students in the process of providing explanations for what they are learning improves understanding. (Chi et. al. 1994)

Students use examples to study and strengthen their understanding. (Chi et. al. 1989)

Interleaving is a Research-Based Approach to Studying

Interleaving involves switching between various activities and studying processes during one session. Interleaving produces poorer speed and accuracy for short-term skill acquisition, but stronger speed and accuracy for long-term skill acquisition. In this way, it is best to vary the work we do with students during 1-1 session so that they can engage in long-term progress. (Shea & Morgan, 1979) The research that drives this home is from Taylor and Rohrer 2010 who studied students who engaged with mathematics using the interleaving approach and those who used blocked approaches (just studying one concept at a time). The results are fascinating! For the students who learned using the blocked approach, the student's dropped from 100% to 38% in just one day. Those

who engaged in the interleaved condition maintained their performance from 81% to 78% the next day.

Social-Emotional-Physical Well-Being Affect a Student's Ability to Learn and Utilize Learning Strategies

Rest and sleep affect the brain's ability to store and consolidate memories (and learning strategies). (Dudai, Karni, & Born, 2015)

Rate of learning pre- dictated attitudes toward school, and school attitudes predicted academic performance. (Geddes et. al. 2010)

There is a strong correlation between students who have strong social-emotional functioning and feel good about a school - we call this school wellbeing. (Angel-González et. al 2017)

In addition, How People Learn: Brain, Mind, Experience, and School: Expanded Edition (Informal Learning) Paperback – September 15, 2000

What is an integrated model of executive functioning?

As I digested all that Google Scholar and Academic Journal articles could provide, and as I endeavored to work with our students, I decided to create a framework, a foundation on which to work. I classify this approach as "informed by research," and as that will continue to develop, I also classify this approach as "malleable."

As I like to say to those who work with me, "this is as far as my brain can take this, so please take these ideas and use them." Further research them, amend them, use them, create with them - I can't wait to see what happens next!

And, without further adieu, here are the constructs of this approach, which are also called the 4 A's:

Academic Research

This approach contains methods that are based on current academic research. This is not all-inclusive of what will be in the future, nor is it at all-inclusive of all of the world's research, but it is my best attempt at grabbing hold of the research that has connected with me during this project.

1. **I can understand Executive Functioning as:**
    a. At its core: Executive Functioning involves cognitive flexibility, working memory, and inhibition. For future definitions of these terms, please refer to the section earlier in this publication, "What is Executive Functioning."
    b. It correlates to Executive Functioning is a part of self-regulation, metacognition, and social-emotional learning; however, other aspects of functioning also influence these areas, so I have to take care to investigate these areas broadly as well as Executive Functioning.
2. **I can understand a student's Executive Functioning by:**
    a. Examining their brain functioning and cognition (Cognitive understanding can be determined through a Mindprint Learning Assessment and Neural Functioning can be determined through a Neuropsychological Evaluation)
    b. Interviewing students and parents (knowing, however, that these results may be different from parent to the student to teacher; and taking care to assess executive functioning purposely along with correlated areas of functioning)
    c. Understanding my student's temperament and personality as well as emotional well-being
    d. Assessing how my student feels about learning, school, work, home life, extracurriculars, and all that he/she/they is involved in
    e. Determining stress levels when my student uses executive functioning (know that high levels of stress will interfere with executive functioning)
    f. Understanding how the age of my student affects their executive functioning (ages 2-6 will see rapid growth, as will adolescence)
3. **I can increase my student's executive functioning skills by:**
    a. Connecting with my student and establishing rapport and trust
    b. Teaching them specific learning strategies which become skills as they are mastered
    c. Having my students use them
    d. Putting the skills into context
    e. Providing opportunities for students to encode, consolidate, store and retrieve the skills and cycling back to review over weeks of time
    f. Creating examples and exemplars for students to follow
    g. Connecting skills with other skills and using them in various constructs

h. Building academic skills - reading, writing, math, general fund of knowledge
i. Providing coping strategies to manage stress
j. Goal-setting and reflecting with my student
k. Other: _____ (I leave room for further actions)

Areas of Inquiry and Instruction

The Evolved Integrated Executive Functioning Model incorporates learning, work, and life experiences into the coaching. For school-aged students, I often begin with the school as this is the major area of work and life for humans of this age, but I am not shy about asking students how their lives are going beyond their school work.

The following are a few examples of coaching work that steps outside of school life:

The Busy Working Parent
Teaching Categorization, Blocked Intensive Focused Work Sessions, Delegation and Systems, as well as Function Organization are some of my favorite strategies to teach this type of student.

Categorization involves sorting tasks and expectations/responsibilities into no more than six categories. By naming the categories, we have a chance of recalling them and providing attention to them. For instance: Home care, Self-care, Child care, Partner time and projects, French learning, and Career are categories we may develop for a student

Blocked Intensive Focused Work Systems occur when we create 30-90 minute work sessions using a Google Calendar. We practice intensely working on a difficult, undesired task and building singular, intensive focus and routine to it. As the student accomplishes the task, we increase the sustained work time. Confidence is built.

Delegation Systems help students to pass off routine tasks usually associated with home and child care to an employee. Oftentimes, we also work with a work assistant to develop ways to offset tasks from my student. This strategy decreases the cognitive load for my student, which is the amount of cognitive energy needed to complete a task. When executive functioning is weak, it can be helpful to offload a certain set of executive functioning tasks to develop new skills within higher levels of functioning.

Functional Organization is a fantastic way to organize things. Instead of creating a desk with school supplies, we create a desk that considers what it is used for. We look at how

the student uses the space and we create an organizational chart and system for that space based on its use. In this way, organization stems from function, not item.

The key to coaching beyond the school setting is to assess and inventory a student's functioning within other areas of their lives. Once you have an idea of how a student has to use their executive functioning outside of English and math classes, you can develop strategies and skills within those areas.

Just as I might provide strategies for a student to manage their home, I also provide strategies and resources for them to be healthy within their social, emotional, and physical functioning.
I ask about sleep, eating, socialization, and emotional health.
I provide connections with life coaches, therapists, doctors, neuropsychologists, and psychiatrists to support my students in their pursuit of well-being.

Assessment

Here is a comprehensive list of assessments.

I use this questionnaire to inventory adolescents.

See this completed questionnaire.

Then, we create a profile based on this intake information.

Strategy Instruction & Skill Mastery

The way we teach executive functioning skills involves the following:

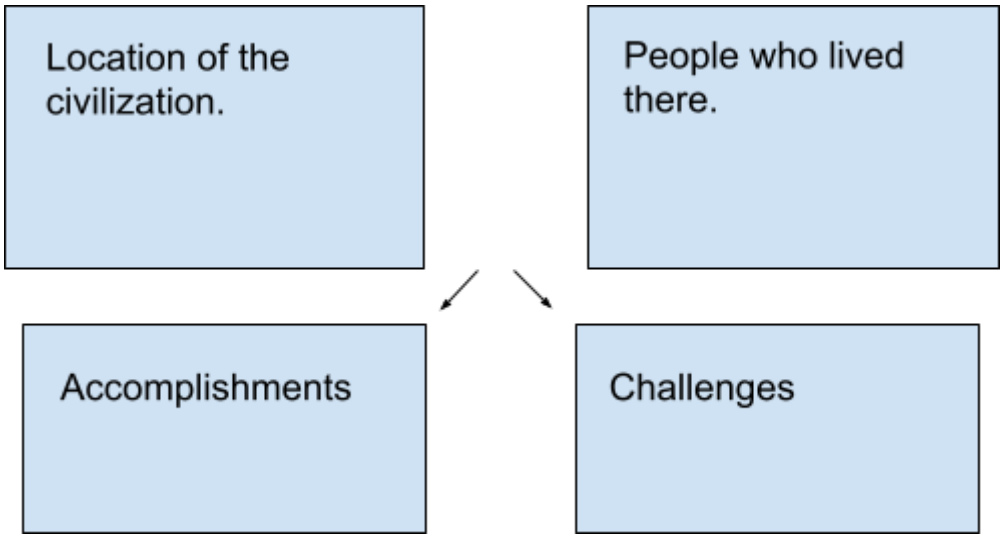
1) Teach WITHIN a subject area
2) Have the student complete a task they need to complete and provide the strategy to support the task completion
3) Name the strategy
4) Write the strategy down and include pictures of it (screenshots and notes)
5) Each session begins with the student teaching me the previous strategies (remember this involves consolidation)
6) We try to work on at least two tasks per session and teach either one or two strategies
7) If possible, I text my student in between sessions to remind them of the strategy and to see if they are using it or recalling it

During the executive function coaching session, I am also involved in building academic skills. Recall, that there is a strong connection between academic aptitude and executive functioning. Thus, my strategy list may include math study guides, biology content graphic organizers, and/or acronyms from Self-Regulated Strategy Development Writing.

When I teach math studying to students, I integrate metacognition practices into the document using a three-column sheet.

Problem	Solution	What “I” Need to Remember About This Problem

When I teach content such as Biology or History to students, I try to show them ways to condense the text, place it into boxes or circles and connect the information with other pieces of the text.



I model a graphic organizer such as this, but then, I require my student to do the labor of the learning (because, hey, the research supports this!).

I love using Stickies on computers to house acronyms we are using with SRSD Writing. POWRE and TIDE are often there. Eventually, the memory of these acronyms becomes so strong that students can release the use of the post-it notes, but this usually takes months and requires consistent exposure and ‘forced’ use.

If you are interested, you can check out my book, 30 Strategies, which will be published in August 2022. Here I offer 30 strategies for everything from planning to studying. The fun is this is just the beginning - students can make strategies for absolutely anything!

In Conclusion

I truly enjoy developing and using the Evolved Education Integrated Executive Function Model. I hope that it ignites excitement for you as well. Please keep coming back to Evolved Education Company where I will continue to share how this model is developing and evolving within our work.

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Please enjoy this reference list! If you have time, read these articles. They have fascinated me, and I hope they also fascinate you!

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