Chapter 18
Teaching Executive Functions: Modeling Independence From Cradles to College for Success

Angela Owens
Education Service Center – El Paso, USA & University of Texas at El Paso, USA

Bernice Garcia
Education Service Center – El Paso, USA

ABSTRACT

Neuroscientists have identified Executive Functions (EF) as the skills and processes persons use to engage in purposeful, goal-directed, and future-oriented behaviors. This chapter will consider the correlation between new research about executive functions and implications for educators in nursery, primary, secondary and post-secondary school settings. The first part of the chapter will provide a synthesis of what EF are and how research about the brain is useful for educators. The second part of the chapter will provide recommendations for educators provided in Boosting Executive Skills in the Classroom: A Practical Guide for Educators as well as other resources available for educators intending to improve EF skills in developing children, preparing them for greater success in college and in the workforce.

INTRODUCTION

This chapter will address how educators can increase the successful development of executive functioning (EF) skills throughout elementary and secondary education settings, leading to greater independence, social application to varied settings and self-regulation in college and throughout adulthood. We draw on current research regarding practical solutions to support students in their development of EF skills (Cooper-Kahn & Foster, 2013) to discuss ways that students can develop skills of self-regulation, independence, and social application to different settings. We provide a review of literature on the growing body of research that has been conducted to reveal the explicit ways that students can learn how to increase their EF skills via explicit, scaffolded instruction and a gradual-release of support as students become more independent.

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Additionally, we consider the implications that EF skills have on the work that is done in the field of education. Zelazo, Blair & Willoughby (2016) provide an in-depth answer to the fundamental question of, “Why is it necessary to explicitly model and build student’s executive functioning skills when they are in elementary and secondary school settings so that they are prepared to live resilient, successful, and independent lives as adults?” The practical application of the work that Cooper-Kahn & Foster (2013) provide to educators, using a four-quadrant model, to ensure student success and implementation of regulatory skills is analyzed and described in a manner that ensures students find success as they transition to college and adulthood. Finally, we explore the impact that EF skills may have on various student populations such as students from varied backgrounds and different learning needs to include students with disabilities and exceptionalities.

Part One: Executive Functions Defined

Brain theories developed by neuroscientists, Alexander Luria and Lev Vygotsky, set the pathway for brain research, however the twenty first century has brought us much new brain research in EFs. This research provides us with a comprehensive look at the role EFs play during academic school years and beyond to make individuals successful, or unsuccessful, members of society. The key is understanding how the brain learns. Current research (Bozeday, 2010) reveals the prefrontal cortex is the chief coordinator of higher order processes. According to Bozeday (2010), twenty first century learning and student success have been revealed through neuroscience. There is a critical role needed for planning, time management, problem-solving, self-regulation, strategic thinking, organizational skills, self-awareness, cognitive flexibility, and monitoring to achieve endeavors beyond various educational settings to include the workplace. These skills are necessary for success in the classroom, post-secondary institutions, and competencies necessary in life, and the workplace, and to be a productive member of society.

EF skills can be broken down into two wide categories: “cool” skills and “hot” skills (Hongwanishkul, Happaney, Zelazo, 2005; Barkley, 2012). “Cool” skills are those skills that manage thinking such as organization and planning, task monitoring, and working memory. “Hot” skills are those skills that manage self-monitoring, emotional control, and inhibitory behavior. This information is helpful because it informs us of people’s individual needs. Further research (Hongwanishkul, Happaney, Zelazo, 2005; Barkley, 2012) explains that “hot” and “cool” skills cannot be separated because they work together as one system. The “cool” networks such as planning, working memory, foresight, and problem-solving provide the what, where, and when of the goal directed action but the “hot” network provides the why.

Sometimes the why can be the reason and motivation needed to achieve the goal. Motivation is always a factor regardless of setting or task an individual is trying to accomplish. “Hot” and “cool” EFs will typically be known to work together in solving a real-world problem. The way both “hot” and “cool” manage it though would vary depending on the extent and emotion.

EFs located in the prefrontal lobe are those brain-based pathways that are required for humans to execute, or perform, tasks. It is also the primary coordinator for many higher order processes (McCloskey, 2008), and they are the skills necessary for learning. EFs are often compared to the “Conductor” of a grand orchestra (Bozeday, 2010). They have also been referred to as the “Coach”, or “CEO” of our brain because they receive much information from other areas of the brain and transform this information into decisions that can lead our behaviors, cognitions, and emotions (Cooper-Kahn and Dietzel, 2008). EFs have also been compared to the “Air Traffic Control System” meaning our brain can focus, hold work and information, and change gears when we needed (National Scientific Council On The Developing Child,