

Chapter 7


Cognitive Flexibility: An Educational Approach

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ABSTRACT

Cognitive flexibility is briefly defined as the ability of individuals to adapt to a changing environment flexibly. This chapter provides a comprehensive review of research to explain the associations between cognitive flexibility and specific 21st-century skills, to understand the definition of the phenomenon from different perspectives, and to examine cognitive flexibility from a broad perspective. The chapter also comprehensively addresses the relationship of cognitive flexibility, which is associated with the prefrontal cortex, with various life outcomes, particularly reveals its relationship with learning. Furthermore, it discusses how cognitive flexibility can be fostered in learning environments through instructional design and technology, as well as the tools (i.e., inventory, scale, test) that can be used to measure and assess this ability.

1. INTRODUCTION

Structural changes and radical transformations that occurred during the industrial revolutions make it challenging for individuals to adapt to these changes, impacting their ability to cope with problems encountered in environmental, economic, social, and cultural contexts. As each era has its unique problems, it is clear that individuals born today will need to tackle significant challenges in an unknown future. In this

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context, educating individuals capable of handling both current and future challenges is of critical importance (OECD, 2018). In other words, this situation necessitates transformations in human development processes, particularly in education. In such a dynamic environment, it is arguably necessary to educate students in a manner that allows them to quickly adapt to daily life and the workforce.

The Partnership for 21st Century Learning (P21) has prepared a comprehensive framework with the support of educators, educational experts, and business leaders (P21, 2019). Within this framework, “flexibility and adaptability” emerge as critical factors among life and career skills. Similarly, institutions and organizations such as the World Economic Forum (WEF) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) also point to adaptability as an important skill. The WEF refers to character traits as skills that are put to work in adapting to a changing environment and consider resilience, adaptability, and social and cultural awareness skills, which are directly and indirectly related to cognitive resilience, under this category (WEF, 2016). UNESCO (2012) groups flexibility and adaptability skills under the category of global citizenship. This skill is seen as critical not only for personal development but also for professional success in the continually changing business world. Given the rapidly changing and global nature of today's economy, success in today's job market requires flexibility and adaptability to interact successfully with creativity, collaboration, complex problem-solving, critical thinking, and information and communication technology (ICT) skills (Vivekanandan & Pierre-Louis, 2020). In this context, the concept of “cognitive flexibility” comes to the forefront. Cognitive flexibility can be briefly defined as our ability to adapt flexibly to changing environments (Cools, 2015). Additionally, the literature indicates that individuals with higher levels of cognitive flexibility have better life outcomes, better social functionality, and less cognitive decline with age (Burke et al., 2019; Zühlsdorff et al., 2023). When relevant frameworks are examined, skills such as cognitive flexibility can be described as basic, soft, life, catalytic, or transferable skills (UNESCO, 2012). In many cases, these are not new concepts or educational outcomes but rather reflect a growing recognition of the complex mix of different competencies needed to navigate and thrive in today's world (Care et al., 2017). The current chapter looks specifically through the lens of cognitive flexibility within the context of these 21st-century skills. In particular, cognitive flexibility appears to offer valuable benefits to individuals' 21st-century skills. In addition, studies have shown that cognitive flexibility contributes to reading comprehension skills in elementary school students (Hund et al., 2023), enhances problem-solving skills in different cultural contexts (Bernardo & Presbitero, 2018), and improves creative thinking in noisy environments (Mones & Massonnié, 2022). Furthermore, it has been observed that acute exercise can positively influence cognitive flexibility, particularly in individuals with high initial cognitive performance

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