Best practices

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Best practice

What is cognitive flexibility?

Psychologists explain cognitive flexibility as the ability to switch or shift thinking from one conceptual representation to another, especially in response to changes in task requirements, spontaneity and feedback from the environment. Cognitive flexibility theoretically has always been thought to be one of the three primary Executive Functions, mediated by the frontal lobes of the brain (Carlson et al., 2016). The triad also includes working memory (WM), our ability to temporarily hold information, and response inhibition, our ability to resist temptation and impulse. When testing these functions and examining their interrelationships, cognitive flexibility is weakly correlated with IQ and WM, although IQ and WM are highly correlated and tend to be inherited. Whereas, cognitive flexibility is less susceptible to heritable factors and therefore more susceptible to environmental factors including training and education (Friedman et al. 2006; 2017). This raises the question whether we can train cognitive flexibility and thereby enhance education.

Cognitive flexibility in an organizational context

To sustain competitiveness in a fast-changing economy, organizations must be agile and resilient. Employing a workforce that adapts quickly to dynamic environmental changes, effectively learns new ways to perform jobs, and makes decisions when faced with unexpected challenges leads to agile organizational performance (Pulakos et al., 2000). Employees are simultaneously expected to switch between various job roles and forms within and across organizational boundaries (Eby et al., 2003). When faced with a rapidly changing workplace and technological advances, flexibility and adaptability are considered as key competencies for individual and organizational career development (Griffin & Hesketh, 2003).

Adaptive behavior or the ability of an individual to adjust his decision making according to changing demands in an increasingly complex and turbulent work environment is relevant to achieve successful job performance (Charbonnier-Voirin & Roussel, 2012). The World Economic Forum (2016) has even regarded cognitive flexibility as one of the top ten core job skills necessary during the Fourth Industrial Revolution (Gray, 2016). With the ongoing advances in information and automation technology, individuals who have more flexible mental processing capabilities can maintain higher levels of performance relative to those lacking this skill.

The aforementioned evidence suggests the importance of cognitive flexibility in successful employee job performance as well as its contribution in achieving organizational objectives.

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Operational criteria for cognitive flexibility in an educational context

Cognitive Flexibility Theory (CFT) in pedagogy has been developed to achieve four main learning outcomes:

- Helping students grasp important yet complex subject matters;
- Foster flexible application of knowledge in real-world settings;
- Alternate underlying approaches to knowledge perception;
- Promote hypermedia educational environments that encourage complex learning and flexible thinking.

The main metaphor used in the educational model of Cognitive Flexibility Theory is having a *criss-cross learning landscape*, which implies nonlinearity in the way of understanding a complex subject matter at different points in time, for different purposes and from different directions (Spiro et al., 1991). By criss-crossing a conceptual field of study, the students have the opportunity to attain knowledge in many ways. When teaching in this manner, the perceiver of knowledge can examine and interpret take-aways from different vantage points; thereby, training the ability to build new cognitive structures and apply theory to new situations.

In complex and irregular domains of knowledge, learning processes which instill greater cognitive flexibility are those that present knowledge with differentiating perspectives and provide students with the ability to construct the learned concepts. To effectively learn cognitively flexible skills and to develop flexible cognitive processing abilities, irregular and flexible learning environments that allow the same concepts to be studied from various perspectives must be present. Explicit and systematic learning conditions that facilitate the development of cognitive flexibility are those that provide students with a large set of cases, representations and diverse or irregular examples in an open thinking environment. The application of cases and minicases prepare students to apply the learned general principles in action-based real-world settings (Spiro et al., 2007; Feltovich et al., 1996).

To gain a better understanding of a complex theory students should be encouraged to apply conceptual insights in a great variety of ways and manners that explain the phenomena through irregular patterns. When trying to explain ill-structured domains of knowledge, applying educational strategies that are used to teach well-structured domains such as in introductory learning may result in in oversimplification, overregularization and excessive dependence on context-independent representations of theory (Spiro et al., 1988).

Educational scholars such as Bourgeois & Nizet (1999) and Frenay & Bédard (2004) propose that, in order to develop cognitive flexibility, students should examine knowledge in different and unfamiliar situations. Such methods of learning reinforce knowledge transfer and strengthen the retention of new knowledge. Furthermore, it is beneficial to provide students with the opportunity to analyze and rethink the newly acquired concepts from alternate points-of-view. To facilitate this learning approach, lecturers ought to ensure: (1) the ability of students expressing their personal interpretations; (2) a compilation and structuredness of opposing points of view; (3) suggestions of various methodologies that manage different perspectives. When presented with alternative points of view, students should systematically switch between them and connect the various interpretations to one-another.

To sum up the above described practices clearly indicate the need to pay a special attention to the development of cognitive flexibilty for students. Such activity Will have a

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significant impact on the employability in a short but also long run.	
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