Moving to Excellence: Embodiment in Gifted Education

Sarah Awad
sarah.awad@fau.de
Department of Educational Psychology and Research on Excellence, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Nuremberg, Germany

“EXCELLENCE IS NOT A DESTINATION; IT IS A CONTINUOUS JOURNEY THAT NEVER ENDS.” (BRIAN TRACY)

A primary goal in education is the continuous optimization of teaching and learning processes. In order to find suitable approaches, it is necessary to gain insight into how such processes might function. Starting by reflecting on how our understanding of the world is shaped, one soon realizes that our entire perception is biased towards the fact that we are in a human body which in turn exists in a certain environment (Glenberg, Witt, & Metcalfe, 2013; Varela, Thompson, & Rosch, 2000). As a consequence for understanding the mind, Wilson (2002) concluded that it can only be comprehended in light of its relationships to a physical body which engages with its surrounding environment. Under the term embodied cognition, in the past decades a whole area of research focusing on the interaction of the mind, the body, and the environment has evolved in cognitive science. As opposed to non-embodied approaches (Sun, 2008), it is assumed that cognitive processes and bodily cues are deeply rooted in each other (Dijkstra & Post, 2015; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005; M. Wilson, 2002). This interplay can open up a number of possibilities for us due to the characteristics of our body and the environment, yet it also brings with it corresponding limits of action and sensation (Clark, Tremblay, & Ste-Marie, 2004; Shapiro, 2014; Varela et al., 2000). When viewing cognitive functioning as the interaction of a system of mind, body and environment, which consequences could arise for educational processes? Furthermore, with regard to the talented or gifted education in particular, what potential optimizations can the view of the body as an essential factor in the formation of cognition offer in the promotion of talent?

By assigning the body a crucial function in the learning process, this does not refer to the body as a mere tool, which executes commands from the brain as a central system and supports it in its cognitive performance. The role of the body might go much deeper: Research on embodied cognition points to positive effects of motor activity on learning processes, for example in mathematics, science, language and music. It is clear from these findings that learning cannot be regarded as a purely mental activity (Sullivan, 2018). Embodiment in learning processes can for instance be seen in the so-called offloading (Iverson & Goldin-Meadow, 1998; M. Wilson, 2002). By taking notes or putting information in gestures (like finger counting to understand numerical concepts, see for example Bahnmueller, Dresler, Ehlis, Cress, & Nuerk, 2014), certain cognitive information is transferred to the environment in order to create cognitive capacities in the working memory. In turn, more complex thinking processes are enabled (Ping & Goldin-Meadow, 2010; Pouw, Nootjer, van Gog, Zwaan, & Paas, 2014).
It was found that learners who use gestures when performing tasks are more likely to remember the content than learners who refrain from using gestures (Alibali, 2005; Alibali & Goldin-Meadow, 1993; Cook, Mitchell, & Goldin-Meadow, 2008; Ping & Goldin-Meadow, 2010; Pouw et al., 2014). Studies have shown individual differences in the gesture-effect on working memory. In this case—contrary to the famous Matthew effect (“the rich get richer and the poor get poorer”, Gladwell, 2008)—particularly students with a rather weak working memory can benefit from the use of gestures in learning (Marstaller & Burianová, 2013). This could for example be beneficial for students who are identified as gifted with Attention Deficit Hyperactivity Disorder (Fugate, Zentall, & Gentry, 2013). Additionally, representative gestures in instructions appear to have positive effects on students’ learning outcomes (Sullivan, 2018). As learners observe an action being performed, they mentally imitate it. This might allow the learning content to be retained and later retrieved more easily (Barchiesi & Cattaneo, 2015; Sullivan, 2018). These findings are suggested to be connected to mirroring effects in individuals, in which they subconsciously imitate nonverbal behaviors of others when perceiving their actions (Sullivan, 2018). Replication of the behavior of others, including facial expressions, gestures, posture, and so forth, may involve replication of a variety of other social parameters, such as the current mood of the person being mirrored (Chartrand & Bargh, 1999; La France, 1982), which might affect further factors important for successful learning, like motivation or social group integration.

Regarding action perception, literature reveals differences in the brain activation of experts compared to non-experts when observing actions in their field of expertise. For instance, fMRI studies with expert dancers have shown effects of their motor expertise on action perception (Calvo-Merino, Glaser, Grèzes, Passingham, & Haggard, 2005). It is suggested that the brain activation may be related to whether or not a subject can perform the observed action (Calvo-Merino et al., 2005). These effects due to simple observation could be applied in gifted education to further promote talent in the student’s field of expertise. Moreover, gifted students with weak motor skills—as it might be the case in twice-exceptional students (i.e. students diagnosed as gifted in one or more areas as well as with having one or more disorders)—could receive support by training including the observation of action.

Further, the literature indicates that there is plenty of support for bodily effects on self-concept. For example, the effect of postures on an individual’s mood and self-perception has previously been investigated. In this context, for instance, it was shown that individuals in upright postures demonstrate a more positive mood and increased confidence in their abilities (see for example Briñol, Petty, & Wagner, 2009; Canales, Cordás, Fiquer, Cavalcante, & Moreno, 2010; Carney, Cuddy, & Yap, 2015; Casasanto & Dijkstra, 2010; Dijkstra, Kaschak, & Zwaan, 2007; Michalak, Mischnat, & Teismann, 2014; Peper, Booiman, Lin, & Harvey, 2016; Peper, Lin, Harvey, & Perez, 2017; Thrasher, van der Zwaag, Bianchi-Berthouze, & Westerink, 2011; Tsai, Peper, & Lin, 2016; V. E. Wilson & Peper, 2004).

What possibilities may arise if, among one another, learners could reinforce positive attitudes toward themselves as well as the learning content? Particularly, the very diverse group of twice-exceptional students could benefit from these effects; by improving their areas of strength and additionally positively empowering their self-concept, the students may be enabled to compensate for their weaknesses (Baum & Owen, 2004; Ralabate, 2008, 2006). One asset of many Figure 1. Experimental study on effects of upright compared to stooped postures (Awad, Debatin, & Ziegler, 2019).
highly able students is an exceptional creative performance. Various research findings suggest positive effects of embodiment on creative output. For example, there have been indications that individuals in open postures achieve more creative performance than individuals in closed postures (see for example Friedman & Förster, 2002; Hao, Xue, Yuan, Wang, & Runco, 2017). These findings could be used to further enhance creative behavior in gifted education.

Concluding, with regard to the future conceptions and developments of gifted programs, the deep role of the body in cognitive processes may not be omitted rather it should be firmly integrated into the curricula. Insights into the talent and development of excellence in a wide variety of fields should therefore incorporate findings on embodiment effects in order to make the best possible use of bodily action to the promotion of talent.

References


Tsai, H.-Y., Peper, E. [Erik], & Lin, I.-M. (2016). EEG patterns under positive/negative body postures and emotion recall tasks. *NeuroRegulation, 3*(1), 23–27. https://doi.org/10.15540/nr.3.1.23

