Insights of brain research in education – music practice and embodiment to enhance learning

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Keynote abstract

Recent developments in brain research methodology allow the use of neuroscientific methods in natural learning conditions. The measurements of brain and other physiological activity in schools in actual learning situations have revealed aspects of education that may enhance learning. Specifically, brain indices of memory, attention and perception allow researchers to study learning in action. Results from such studies highlight the importance of building motivation, states of flow, collaboration, and goal-directed actions in learning, while they also show the harmfulness of acoustic and visual noise, feelings of threat, and adverse physiological learning states like sleep deprivation for education. In this talk, two important lines of neuroscientific research in education are discussed in more detail. First, the benefits of using music in learning are presented from the brain development and plasticity point of view, showing benefits of long-term practicing to play a musical instrument or to sing, but also short-term benefits of altering one's physiological state by listening to carefully chosen music. The musician's brain and its plasticity and good connections are used as an example of learning benefits of music as a hobby. The physiological states are presented to highlight their effects on learning possibilities. Second, studies on the use of embodied learning methods are presented, allowing a deeper understanding on the interplay of mental and physical understanding of the world in the context of learning. Craft and design activities are complex brain activities that allow part of our cognitive capacities to be located in an embodied space, between the brain and the hands. Finally, some future trends of the use of neuroscience in learning and education are presented.

Biography

Minna Huotilainen is Fellow at Swedish Collegium for Advanced Study in Uppsala University and researcher at Cognitive Brain Research Unit in University of Helsinki. She has authored more than 160 articles in peer-reviewed scientific journals and "Tunne aivosi", a book popularizing neuroscience. She is a neuroscientist who studies brain activity from the point of view of learning. Specifically, she has studied the benefits of musical hobbies and musical learning in childhood, infancy and even during the fetal period. She has also studied working life and the consequences of stress and work fatigue to cognition. In Handling Mind project, she has studied craft and design activities with neuroscientific methods. She is eager to find practical applications to brain research and physiological measurements and she is known for her efforts in popularizing science.