

# Emotional Response and Cognitive Performance in Digital vs. Presential Environments

Anabela Pereira

Iscte-Instituto Universitário de Lisboa, Portugal

[anabela\\_c\\_pereira@iscte-iul.pt](mailto:anabela_c_pereira@iscte-iul.pt)

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**Abstract:** Starting from the theoretical background of cognitive embeddedness emphasizing the interdependence of a cognitive phenomenon on its environment, this research aims to test what kinds of influence digital embedding has on cognition. Cognitive embeddedness highlights the fact that “agents are coupled with a dynamic world” i.e., the physical interaction between the body and the world constrains the behaviours of the organism, which in turn, impacts and integrates the cognitive processes emerging from the interaction between them (Dawson, 2014, p.61-63). As Wilson (2002) states, “off-line cognition” (i.e., mental imagery, working memory, episodic memory, implicit memory, reasoning, and problem-solving) is body-based (Wilson, 2002, pp.632-634). Therefore, even if we think of cognition as dissociated from a specific environment, “the activity of the mind is grounded in mechanisms that evolved for interaction with the environment – i.e., mechanisms of sensory processing and motor control” (Wilson, 2002, p.626). Empirically, the idea is to test participants’ neuropsychological states and cognitive performance (after zoom and presential classes, seminar, or meeting), through neuropsychological assessment questionnaires, and one wearable headband that simultaneously acquires EEG (electroencephalography) and PPG (photoplethysmography) signals, through two pairs of frontal electrodes placed in the prefrontal region of the left and right hemispheres and an earlobe sensor, while a digital platform receives these signals, using different measures associated with cognitive control, emotional response, and biometrics. We hypothesized that the characteristics of the digital environment affect executive functioning, attentional functioning as well as physical and emotional states, leading to different levels of cognitive efficiency (vs. presential environment). We expect these changes to be bond to the environment, and in addition, we predict that these will be modulated by the perceptions and literacy participants had on the digital environment.

**Keywords:** embedded cognition, selective attention, emotional response, digital environments, biometrics, cognitive performance

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