Do we betray errors beforehand? Using eye-tracking and automated facial analysis to gather insights on learning from errors

Christoph Fischer[1], Torben Töniges[2] and Christian Harteis[1, 1]Paderborn University and [2]University of Bielefeld

Since working life became complex and challenging, learning from errors became an important issue of organizational success and individual professional learning. From a theoretical perspective, learning from errors requires consternation and emotional reactions, otherwise cause analyses and reflection upon alternatives remain undone. The eyes are crucial sensors for information processing and the human face reflects emotional reactions. Hence, both are relevant sources for the investigation of learning from errors. On the basis of standardized video tasks, 20 subjects are repeatedly prompted to problem solving and conducting errors. Learning from errors is measured through the avoidance of the identical error in a repeated attempt. The experiments aim at investigating (a) if learning from errors requires an emotional reaction as claimed by Oser and Spychiger, and (b) if looking behavior and face expression presage committing an error. The first issue is relevant for the theory on learning from errors, the second issue is of specific relevance for human-machine interactions and the design of digitalized workplaces. Looking behavior is gathered by eye-tracking data (e.g. saccadic amplitudes) and emotional reactions are gathered through automated facial analysis of video data. Multiple temporal features - derived from video data like facial action units and facial appearance changes - serve as indicators for emotional reactions while pupil dilation indicates cognitive activity. The contribution reflects the reliability of eye-tracking and facial analysis data for analyzing professional learning processes.