

Expertise Differences in Air Traffic Control: An Eye-tracking Study

Abstract. Air traffic control (ATC) involves dealing with complex visualizations. Making decisions based on those visualizations requires not only conceptual but also perceptual skills, like efficient visual search of critical airplane compositions, their quick and correct interpretations, and the appropriate reactions. This study examined expertise differences in perceiving and interpreting ATC stimuli on a perceptual and performance level. Moreover, the potentially mediating influence of spatial abilities was investigated. Expertise differences were found between experts, intermediates and novices in ATC performance and eye movements. No expertise differences were found in spatial ability.

Keywords: expertise; eye tracking; spatial ability; instructional design; air traffic control