Derivation of young children's interaction strategies with digital educational games from gaze sequences analysis

ABSTRACT

Digital Education Games (DEGs) have been used to support children's learning in various domains. A number of existing studies on DEGs has focused on whether they could improve children's learning performance. However, only a few of them have attempted to address the critical question of how young children interact with DEGs. Bridging this gap was the main motivation underpinning this research study. With the use of eye-tracking technology, we explored our research goal by evaluating a bespoke DEG on numeracy and its cardboard version that we developed based on the UK Early Years Foundation Stage (EYFS) framework. A between-subject experiment study involving 94 five-year-olds was conducted. The research protocols and instruments were pilot tested and ethically approved. In analysing the eye-tracking data, we refined the *Gaze Sub-sequence Marking Scheme* to infer children's interaction strategies. Results showed that the difference in the learning effect between the digital and cardboard game was insignificant, that the children's interaction strategies varied significantly with their achievement level, and that children's gender was not a significant factor in determining the impact of learning with the DEG. Implications for rendering eye-tracking technology more child-friendly and designing DEGs for young children are drawn.