Improving the working memory during early childhood education through the use of an interactive gesture game-based learning approach

Título Improving the working memory during early childhood education through the use of an interactive gesture game-based learning approach

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Abstract One of the most socially and culturally advantageous uses of human-computer interaction is enhancing playing and learning for children. In this study, gesture interactive game-based learning (GIGL) is tested to see if these kinds of applications are suitable to stimulate working memory (WM) and basic mathematical skills (BMS) in early childhood (5-6 years old) using a hand gesture recognition system. Hand gesture is being performed by the user and to control a computer system by that incoming information. The research was developed using a quasi-experimental design with a pre-test and post-test, using both an experimental and control group through three phases: the first one was the prior evaluation of the learner's skills; a second phase in which the use of the technology was developed; and a final phase of evaluation. In the evaluation phases, working memory was measured using the Corsi Task, and the basic mathematical skills using the test for the diagnosis of basic mathematical competencies (TEDI-MATH). The results provide clear evidence that the use of these technologies improved both working memory and basic mathematical skills. We can conclude that the children who used Gesture Interactive Game-Based Learning technology showed a significant increase in their learning performance in WM and BMS, surpassing those who did normal school activities.

Palabras chave Basic Mathematical Skills, Early Childhood Education, Gesture Interactive Game-Based Learning, Human-Computer Interaction, Working Memory

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