

摘要

擴增實境（augmented reality，AR）近年與行動裝置結合，透過操控的互動性，成為數位教學輔助教材，讓學生在充滿趣味的情境中學習。本文以國小視覺藝術課程為應用場域，將 AR 操控的概念模式劃分為觀察式、探索式與自拍式，於階段一進行傳統授課與 AR 輔助教學之比較；階段二納入個體之單模、雙模、三模與四模的學習風格，探討其對學習動機與認知負荷之影響。結果顯示，相較於傳統授課，所有類型 AR 輔助均能顯著提升學習動機與減輕認知負荷。從學習動機來看，觀察式 AR 在注意與滿足的誘發較其他類型為佳，單模、雙模、三模的學習風格者在相關與自信構面感受更明顯；認知負荷方面，單模偏好者因接收管道限縮，心智負荷及心智努力顯著高於多重模組者，而探索式 AR 的心智努力感受則相對較輕。本研究成果除提供 AR 在藝術領域教學輔助的設計參考，亦可作為資訊融入教學研究的基礎。

關鍵詞：概念模式、認知負荷、學習風格、學習動機、擴增實境

Abstract

In recent years, the development of augmented reality (AR) has gradually been combined with mobile devices and has become an auxiliary teaching material for digital education. Through the interactivity of interface control, students can learn in a fun and engaging environment. Therefore, in the first experimental phase, this study used traditional teaching and AR learning assistance methods, attempting to classify AR applications into three interface operation conceptual models: observational, exploratory, and selfie. The second phase incorporated the subjects' learning styles, which were categorized as single, dual, triple, and quadruple modes. The study then explored their influence on students' learning motivation and cognitive load when introduced into elementary school visual arts curriculum instruction. The results showed that compared to traditional instruction, all types of AR-assisted teaching significantly improved learning motivation and reduced cognitive load. From the performance of learning motivation, students paid closer attention and were more satisfied when taught with observational AR. Those who prefer single-mode, dual-mode, and triple-mode learning styles have more obvious relevance and confidence. In terms of cognitive load, those who prefer single-mode learning style have significantly higher mental load and mental effort than other multiple modules due to limited information receiving channels, while exploratory AR make a relatively lower perception in students' mental effort. In addition to providing a design reference for AR in the field of art teaching assistance, this research result can also serve as a basic extension of information integration teaching research.

Keywords: conceptual model, cognitive load, learning style, learning motivation, augmented reality