

Applying Computational Thinking and AI bot to Integrate Critical Thinking Teaching in Elementary School in Hong Kong

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Abstract

In the educational environment where artificial intelligence is becoming prevalent, critical thinking has become particularly important. Language educators, when appropriately using AI for teaching, should simultaneously encourage students to question, analyze, and evaluate the information they receive from AI or other sources. This action research applies computational thinking in Chinese language teaching at the elementary level in school in Hong Kong, targeting sixth-grade students. Our teaching unit uses the concept of "heroes" as the theme for exploration, requiring students to analyze and debate from both Western and Chinese cultural perspectives. We apply UDL principles to curriculum design to enhance the participation of all students and fully consider their diversity.

Under the UDL framework, this study will combine the Blended Ladder (Gravel, Mika & Soger, 2014), allowing students to create a "Hero's Journey" VR game. Students need to utilize computational thinking skills to design various levels and integrate unit writing techniques in scriptwriting (environmental setting, character description) to let others experience the challenges and decisions faced by the hero character. In the second learning stage, students debate the definition of "hero" and analyze the differences in the definition of "hero" in Western and Chinese cultures, combined with trained AI bot dialogue practice, thereby effectively developing students' critical thinking and writing. The results of questionnaire surveys and qualitative analysis show that this instructional design encourages students to deeply understand the similarities and differences in the definition of heroes in Western and Chinese cultures, and helps to cultivate their critical thinking abilities and argumentative writing skills. This effectively enhances students' language comprehension abilities and critical thinking skills, and helps cultivate their cross-cultural understanding abilities.

While critical thinking has been widely applied in various educational studies, research on its combination with computational thinking remains limited. The cultivation of critical thinking often focuses on traditional methods such as text analysis and argumentative writing. This study, through the innovative teaching method of VR game

design, enables students to experience and enhance critical thinking skills in practice, providing a new research perspective in this field.

Keywords: Critical Thinking Teaching, Computational Thinking, AI bot Dialogue, VR designs