

Abstract

Title

Strengths-Based Trauma-Informed Training with AI Agent Simulation for Enhancing Trauma-Informed Competence Among Taiwanese K–12 Teachers: A Local Innovation with Global Educational Implications

Research Overview

This study addresses the global need for scalable trauma-informed teacher development by examining a Taiwan-based simulation model of Australian strengths-based trauma-informed training supported by a dual-process AI Agent. Utilizing generative AI to create scaffolded, psychologically safe environments, this research tackles the "knowing-doing gap" in implementing trauma-informed principles.

Research Purpose

Responding to the global imperative for student well-being, trauma-informed education is critical for reform. However, cognitive overload often causes teachers to default to punitive, automatic reactions. The objectives are: (1) to evaluate the integration of Dr. Tom Brunzell's TIPE model with a bespoke dual-process AI Agent system in Taiwan; (2) to empirically compare this AI-supported intervention against traditional reading in fostering comprehensive TIP-KAP (Knowledge, Attitudes, and Practices) competencies; and (3) to deconstruct the psychological mechanisms of teacher change using the B-R-S-E-C framework, providing insights into professional internalization and knowledge-to-practice transformation.

Research Methods

A mixed-methods quasi-experimental design involved 29 K–12 practitioners from Taiwan ($N_{\text{intervention}} = 16$, $N_{\text{control}} = 13$). The intervention group received an 8-hour TIPE curriculum and a 2-hour immersive **dual-process AI Agent** simulation. This innovative **dual-process AI Agent** system, developed by the research team and based on Kahneman's dual-process theory, comprises two distinct components: an AI Agent Case Simulator (targeting System 1 processes) for immediate, intuitive practice in a "low-stakes, high-challenge" environment, and an AI Agent Coach (targeting System 2 processes) for

metacognitive reflection and strategic refinement. The control group engaged in 10 hours of structured academic reading. Quantitative assessment used the TIP-KAP scale, analyzed via paired-samples t -tests and one-way ANCOVA (controlling for pretest scores). Qualitative data from teacher-AI interaction transcripts underwent directed content analysis using the TIPE B-R-S-E-C framework to identify professional internalization patterns.

Results and Discussion

Quantitative analysis revealed the intervention group achieved significant improvement in overall trauma-informed competency, $t(15) = 3.31, p = .005$, with gains across all TIP-KAP dimensions, notably in attitude, $t(15) = 5.17, p < .001$, and knowledge, $t(15) = 2.89, p = .011$. The reading group showed no significant shifts. For pedagogical practice, ANCOVA indicated the intervention group significantly outperformed controls after adjusting for pretest scores, showing a marginally significant effect, $F(1, 26) = 4.06, p = .054$, with a medium effect size (partial $\eta^2 = .14$). This suggests the **dual-process AI Agent** bridged the "knowing-doing gap" by translating understanding into actionable strategies, demonstrating practical relevance. These findings highlight AI-mediated experiential learning's potential for tangible improvements in teacher competence.

Qualitative findings from teacher-AI interaction transcripts illuminated the internalization of trauma-informed practice. Educators using the **dual-process AI Agent** Case Simulator shifted from deficit-oriented correction to "body-first" regulation, detecting physiological cues and prioritizing nervous-system stabilization, moving towards compassionate repair. The **dual-process AI Agent** Coach acted as a metacognitive catalyst, slowing reactive cycles and prompting reframing student resistance through a strengths-based, trauma-informed lens. This dual-agent synergy facilitated a transition from abstract knowledge to embodied, relationally attuned, strengths-based trauma-informed pedagogical action. This research contributes to trauma-informed pedagogy, AI-mediated professional learning, and strengths-based psychological models in K–12 education, offering insights for global educational contexts, particularly regarding cross-cultural transferability and adaptation of evidence-based models like TIPE.

Keywords

Strengths-Based Trauma-Informed Education; Dual-Process AI Agent; TIP-KAP Competency; Teacher Professional Development; B-R-S-E-C Framework

