



An AI-Simulation Feedback Model to Boost Critical Thinking in Orthopedic Nursing

人工智能模拟反馈：提升骨科护理批判性思维

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Background

- Critical thinking (CT) is essential for safe, evidence-based nursing.
- Conventional teaching often limits integration of theory with clinical decision-making, especially in orthopedic nursing.
- Combining AI, concept mapping (CMAP), and virtual patient simulation may strengthen analytical reasoning and reflective learning.

Objectives

- Evaluate the feasibility of the AI-Simulation Feedback Model.
- Assess CT improvement using AI-assisted CMAP scored
- Examine BI performance (history taking, diagnostic reasoning, safety) across iterations.

Note / Clarification for Methods Section

- Outcomes were measured after each iteration to observe progress across the AI-Simulation feedback loop.

Methodology

Design & Participants

- A 3-week single-group pre-post pilot study involving 30 third-year nursing students in an orthopedic course.

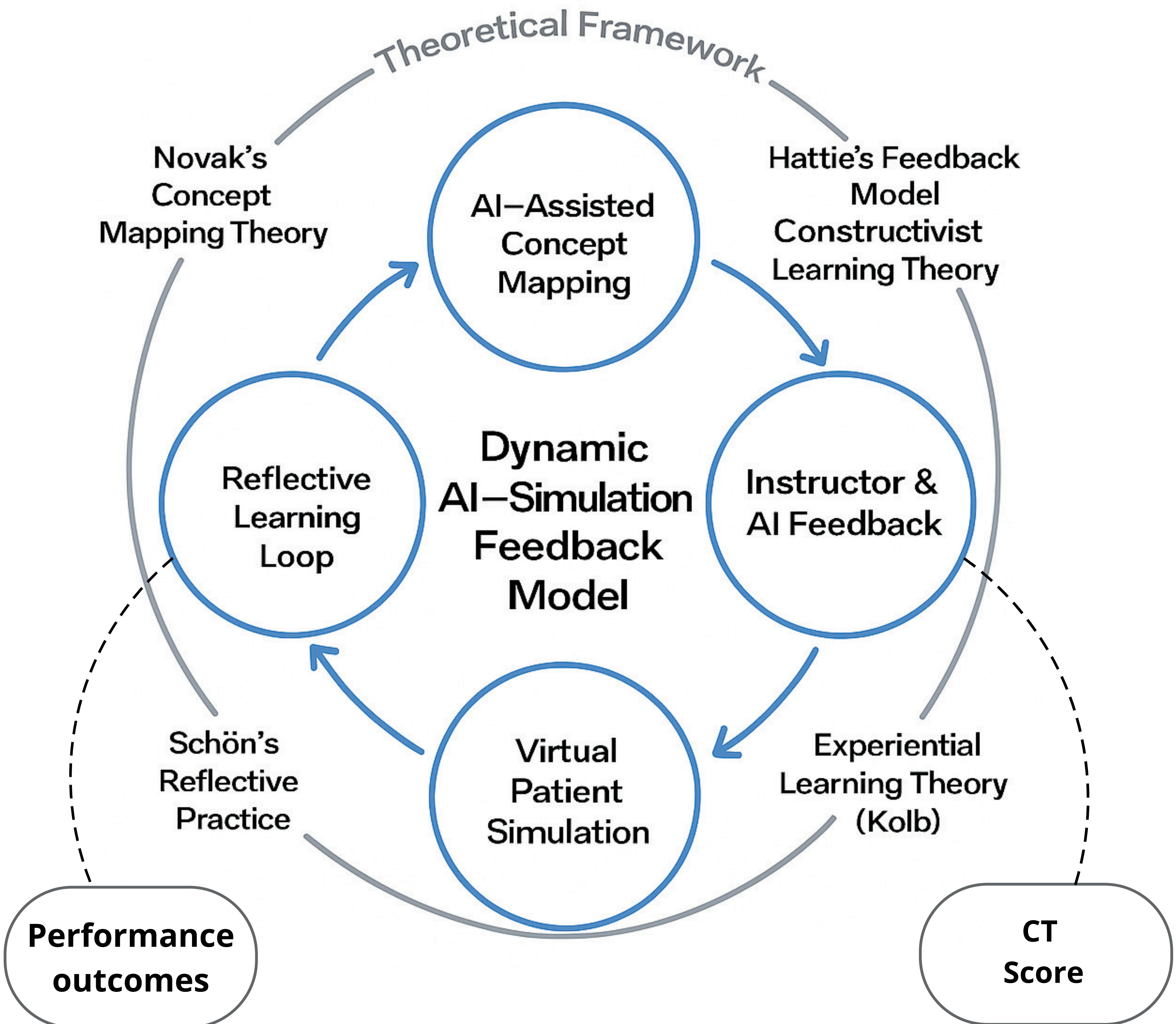
AI-Simulation Feedback Loop Structure

- The program comprised two complete iterations of the AI-Simulation feedback cycle within three weeks.
- Both iterations used the same clinical case to ensure comparability and valid measurement of improvement.
- Week 1-2: Video-AI-assisted CMAP –Feedback – BI Simulation –Outcome measurement
- Week 3: CMAP (same case) –Feedback – BI Simulation –Outcome measurement

Measurements

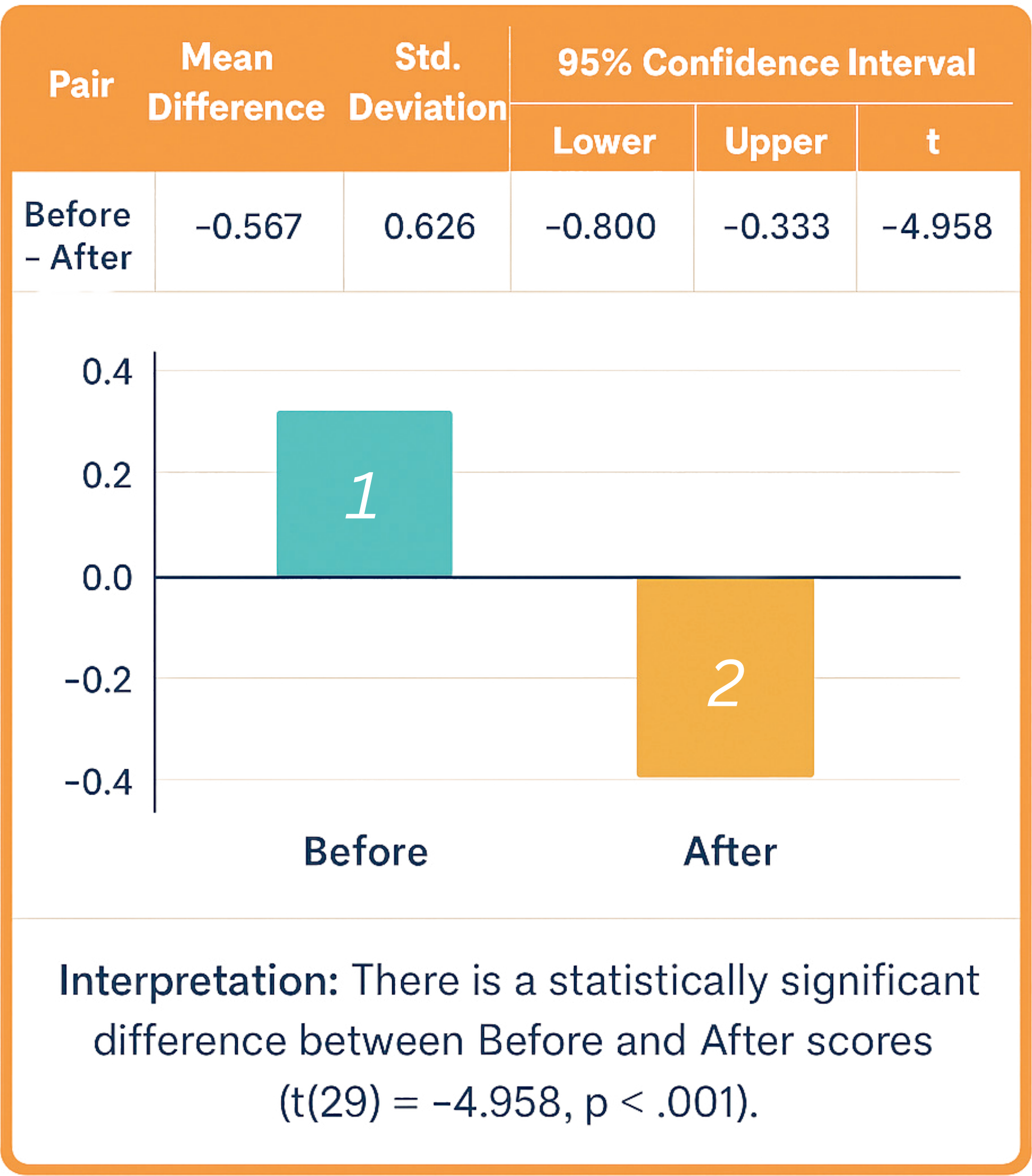
- Critical Thinking (primary): CMAP scored with 12-item CT rubric; paired t-test compared Iteration 1 vs 2.
- BI Performance (secondary): History taking, diagnostic reasoning, patient safety assessed each iteration; reported as mean ± SD and % change.

AI-Simulation Feedback Model



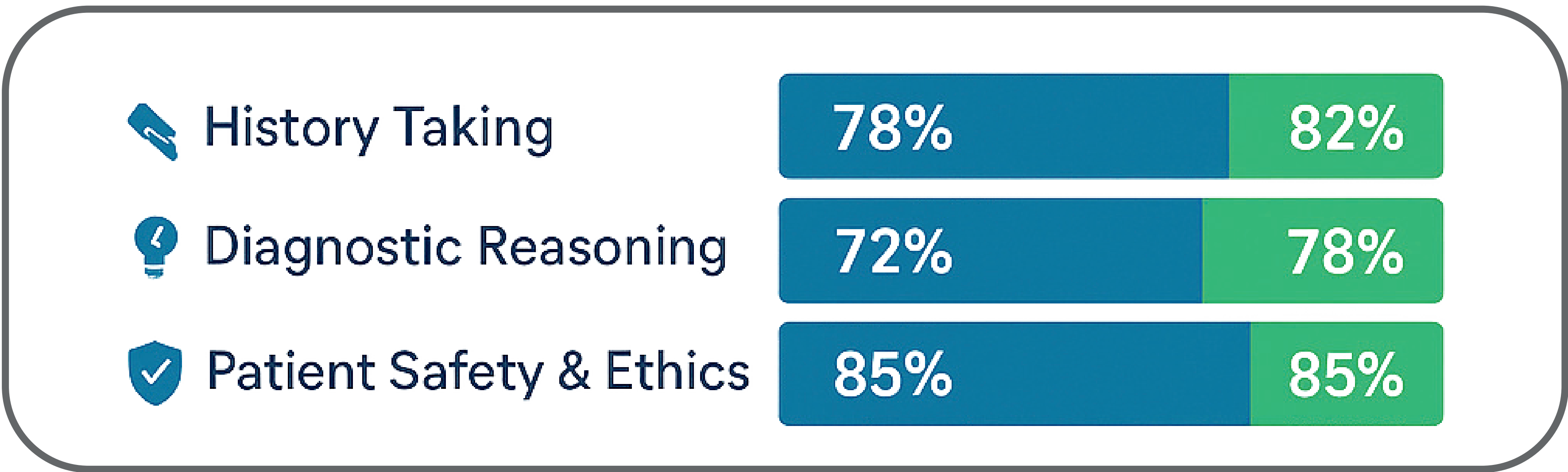
Result

CT Score



+28% increase

BI Performance



Conclusion & Discussion

- The AI-Simulation Feedback Model enhanced critical thinking by linking cognitive and experiential learning, promoting reflective, self-directed, and collaborative learning.

"Knowledge grows, and care improves"

More info

