

Performance Behavioral Analysis of Nursing Students for AI-Based Simulation Feedback Design: A Video-Based Qualitative Content Analysis

Lee Na Kyoung¹

¹Dongshin University, Department of Nursing, Assistant Professor



Key Simulation performance gaps were not primarily knowledge deficits; they were execution gaps in role transition, responsibility-taking, and structured communication.

PURPOSE

To identify nursing students' performance behaviors and intra-team communication patterns during simulation practice, and to provide foundational data for AI-based real-time performance feedback and debriefing systems.

DATA CORPUS

48 video recordings	864 total minutes
48 simulation sessions	188 4th-Grade nursing students

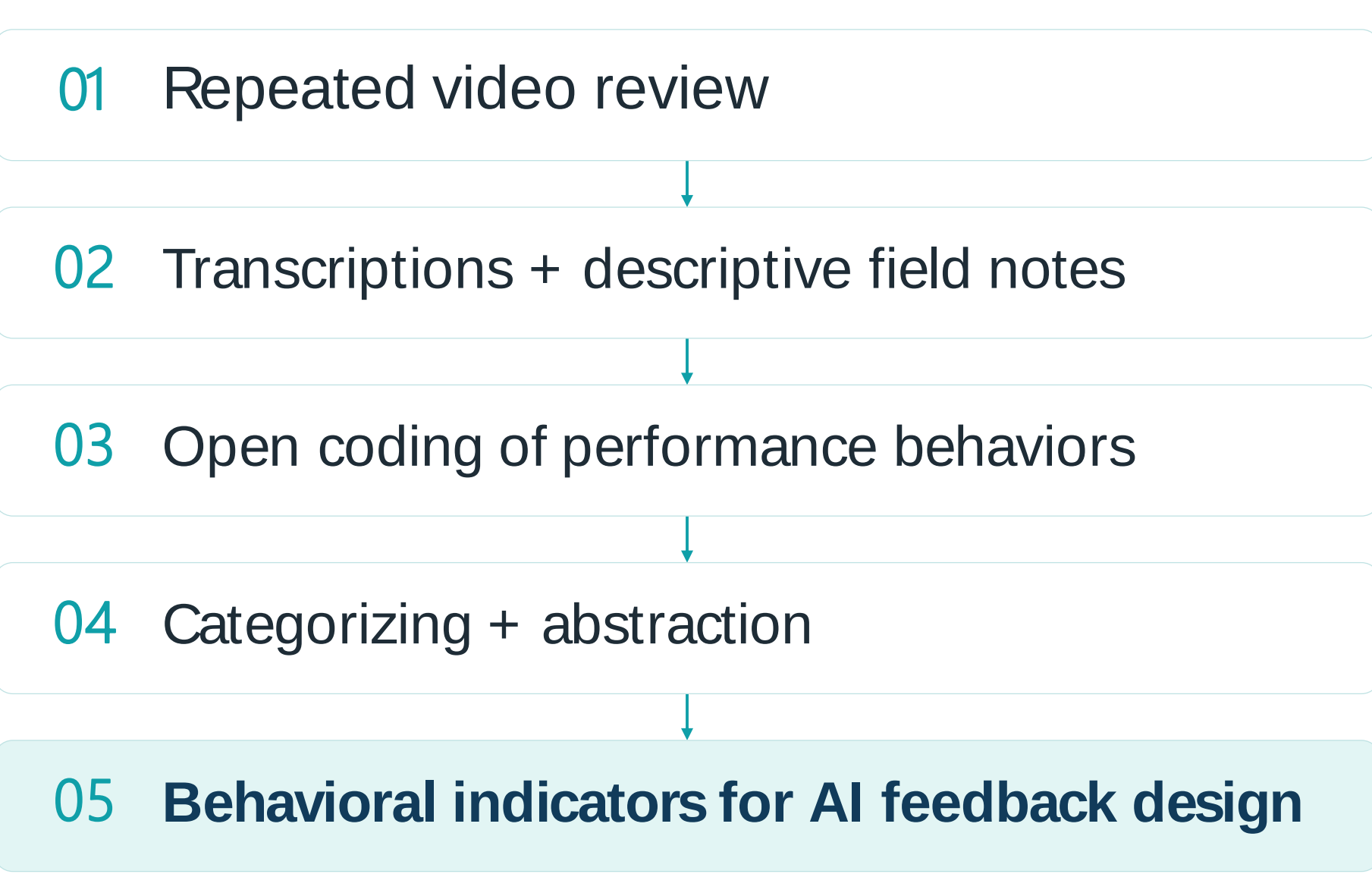
Study context: D University simulation practice during the first semester of the 2026 academic year. Videos were recorded after prior written consent.

RIGOR / TRUSTWORTHINESS CHECK

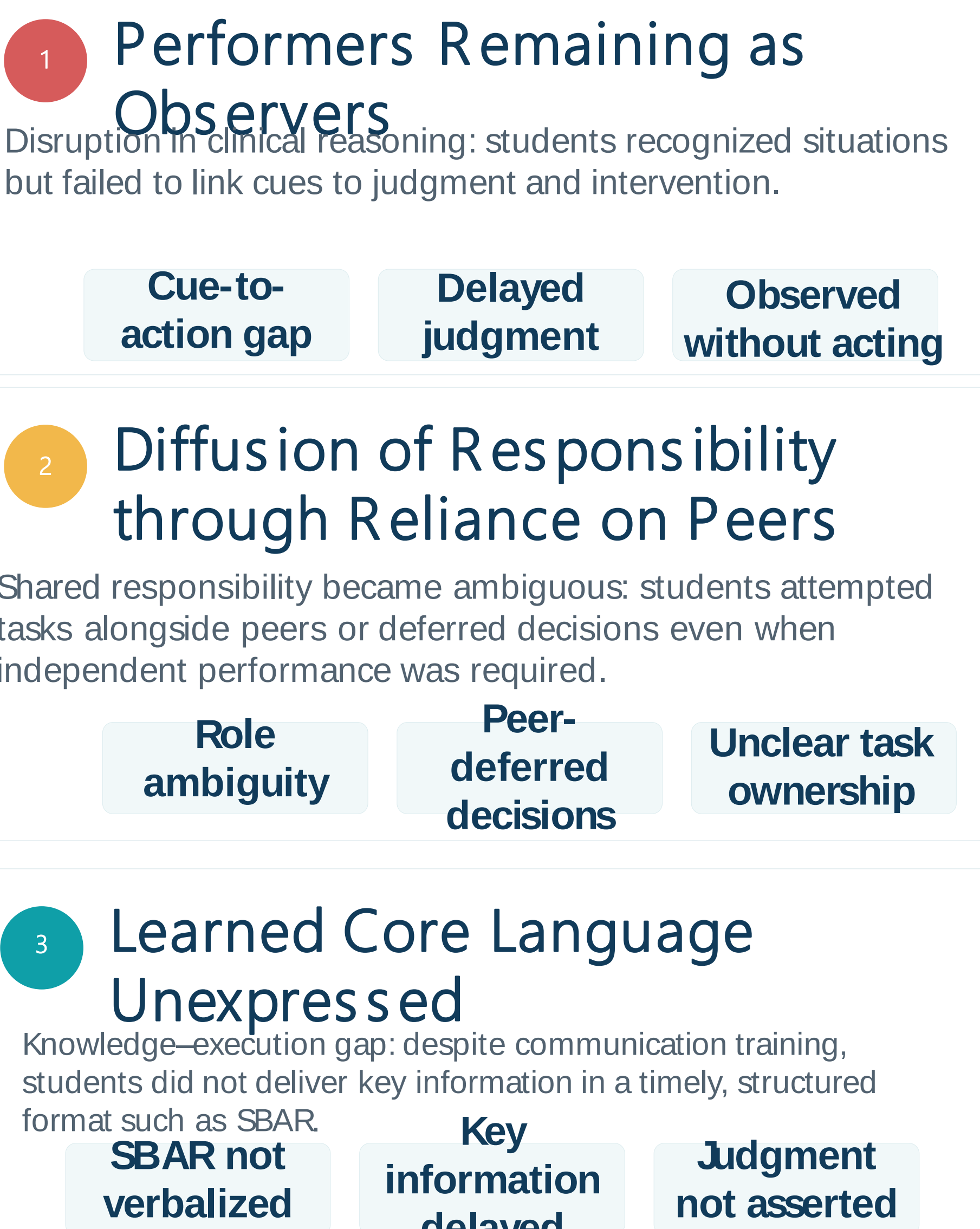
Credibility	Repeated video review, transcripts, descriptive field notes
Dependability	Inductive coding process: coding → categorizing → abstraction
Confirmability	Cross-analysis by two nursing professors
Participant validation	Member checking with research participants

Validation note: The analytic design aligns with established qualitative content analysis and qualitative trustworthiness frameworks.

METHODS: QUALITATIVE CONTENT



RESULTS: 3 MAIN THEMES / 9 SUBCATEGORIES



CROSS-THEME SYNTHESIS

Students often knew what should be done, but hesitated to convert knowledge into visible action, verbalized judgment, and accountable team leadership.

AI-BASED FEEDBACK DESIGN IMPLICATIONS

- 1 Motion / posture recognition**
Detect hesitation, inactivity, role transition, and approach-to-patient behaviors.
- 2 Speech / utterance analysis**
Identify missing SBAR structure, delayed information, and unasserted clinical judgment.
- 3 Team communication mapping**
Track who initiates, defers, confirms, or takes responsibility during critical moments.
- 4 Personalized debriefing tutor**
Supplement faculty-led debriefing with concrete behavioral evidence and targeted prompts.

CONCLUSION

Performance issues during simulation stemmed from failures in role transition, responsibility-taking, and structured communication rather than from lack of knowledge.

The identified behavioral indicators offer concrete criteria to supplement traditional faculty-dependent debriefing and support AI-based real-time performance feedback systems.

Expected contribution: evidence-informed AI debriefing tutors that give timely, individualized, behavior-specific feedback.

KEYWORDS

Nursing students

Simulation training

Artificial intelligence

Qualitative research

Takeaway for AI design: convert video and speech traces into observable feedback on “who noticed, who acted, who took responsibility, and who communicated structured judgment.”