

## Supplement File S2

Table S2: Outcome Measures Using Kirkpatrick's Evaluation Framework.

Study	Level 1		Level 2				
	Perception	Satisfaction	Knowledge	Skill	Confidence and Anxiety	Attitude and Motivation	Critical Thinking and Clinical Reasoning
Chang et al., 2022 [27]	Interview and open-ended questions	Learning satisfaction scale	MCQs, 20 items	-	-	Learning attitude scale Learning motivation scale	Critical thinking disposition scale
Yu and Yang, 2022 [49]	-	Using 3 items, 5-point scale	Content related tool, 20 items	Content related tool	Scale for simulation studies; Koran language	-	-
Yu et al., 2021 [48]	Debriefing	Using 3 items, 5-point scale	High-Risk Neonatal Infection Control Competency Scale Knowledge, 28 items	High-Risk Neonatal Infection Control Competency Scale performance	-	-	-
Thompson et al., 2020 [46]	Perceived engagement questionnaire (PEQ)	-	-	-	-	-	-
Smith et al., 2021 [43]	-	NLN Satisfaction and Self-Confidence in Learning scale	-	Decontamination Checklist	NLN Satisfaction and Self-Confidence in Learning scale	-	-
Siah et al., 2022 [42]	Perceptions of nursing-related aspects of peri-operative scale	-	-	-	Researcher-developed 5-point scale	Researcher-developed 5-point scale to measure attitude	-
Jeong et al., 2022 [35]	-	Numerical rating scale	10 questions based on the "Guidelines for Coronavirus	-	Self-efficacy for nursing care of	-	Clinical reasoning capability, 5-point scale

			Infectious Disease-19 Response"		respiratory infectious diseases, 5-point scale		
Giordano et al., 2020 [33]	-	-	Opioid Overdose Knowledge Scale	-	-	Opioid Overdose Attitudes Scale	-
Smith et al., 2018 [44]	-	-	20 questions based on Orientation to Hazardous Materials	Decontamination checklist developed by researchers	-	-	-
Dang et al., 2021 [6]	-	-	MCQs, 28 items	-	-	-	-
Hardie et al., 2020 [34]	Qualitative analysis revealed positive evaluations of the IVR	-	-	-	-	Virtual reality learning environments (VRLE) tool to investigate learners' attitudes (interaction, immersion, imagination, motivation, and problem-solving)	-
Yang and Oh 2022 [47]	-	-	Neonatal resuscitation nursing knowledge measurement tool. 30 questions	-	Self-confidence tool based on contents. State-Trait Anxiety Inventory (STAI) scale	Modified Learning Motivation Test Paper	Korean version of Nurses Clinical Reasoning Scale Problem-solving ability of adults, 30 questions
Butt et al., 2018 [26]	User-reaction survey developed by researchers to qualitatively measured subject's. Post 2 weeks follow-up	SUS and adjective rating scale were used to test effectiveness, efficiency, and satisfaction.					
Chao et al., 2021 [30]	Feedback	Satisfaction questionnaire based on contents	Nasogastric tube feeding quiz - 15 items true/false	-	Self-confidence tool	-	-

Chao et al., 2022 [29]	Open-ended responses	Researcher-developed satisfaction survey	-	-	-	-	-
Adhikari et al., 2021 [25]	Focus group or individual interview	-	-	-	Nursing Anxiety and Self-Confidence with Clinical Decision-Making Scale, 6-point scale	-	-
Choi, 2022 [31]	Written comments	-	20 MCQs, basic wound dressing knowledge	-	-	-	-
Lee et al., 2020 [37]	Open-ended qualitative questionnaire of advantages and disadvantages of VR	SUS					
Silva et al., 2022 [39]	-	-	-	Nursing Skills Assessments Scale	-	-	-
Jung and Park, 2022 [36]	-	Modified satisfaction scale	Knowledge of Chemoport insertion surgery questionnaire, 10 items	-	-	Assessment of attitudes, habits, and beliefs scale. Materials Motivation Scale	-
Taçgin, 2020 [45]	-	-	Revised Simulation Effectiveness Tool (SET) 5 points scale -8 items	-	SET, confidence (5 items)	SET, attitude (6 items)	-
Samosorn et al., 2020 [41]	Presence Questionnaire (PQ) assessed the realism	-	MCQs, 15 items	-	-	-	-