

The Feasibility of Testing the Effects of a Simulation Elective on Clinical Judgment & Academic Performance

Catherine Bailey PhD, RN

Deborah Tapler PhD, RN

Michelle Piper, MSN, RN

Objectives of the Presentation

- 1. To identify the structure and process of the course**
- 2. To describe methods of comparing outcomes with student groups**
- 3. To discuss comparisons of students' performances with their graduating class at the end of the curriculum**

Goals of the Course

- **Learners should be able to:**
 - **apply previously learned knowledge.**
 - **demonstrate critical thinking to plan safe & appropriate care.**
 - **demonstrate confidence & competence.**
 - **apply effective communication & collaboration.**
 - **discuss ethical & legal issues with end of life decisions.**
 - **evaluate the effectiveness of nursing care through reflective discussions & identify strategies for improvement.**

Circulated Flyers:
Blackboard
Advisors
Bulletin Boards

N4902 - Critical Care Simulation



SUMMER I ELECTIVE

Tuesdays & Wednesdays at 9:00am - 12:00pm (June 9 & 10, 16 & 17, 23 & 24, 30; July 1, 7 & 8). Opportunity will be available to complete course by July 3.

COURSE DESCRIPTION

The focus of the course is to improve clinical skills & critical thinking in a fast-paced environment, designed for students who want to work in adult or pediatric critical care after graduation. This will be a hands-on experience for small groups. Students will have the opportunity to work with both adult & pediatric "patients." There will be limited simulation preparation and no exams or quizzes. Class size is limited.

Prerequisite: Completion of N4045 & N4055 or instructor approval

Course Codes: Section 37 (M. Piper - 29437) or Section 38 (C. Bailey - 29438)

For more information, please contact Dr. Bailey (cbailey2@twu.edu/214-724-2163) or Mrs. Piper (mpiper@mail.twu.edu/469-855-1271)

Structure of the Course

**22 Nursing Students prior to their last semester of school
with completion of all Med-Surg didactic content**

Facilitators for 5 students/simulator

2 Faculty members (1 adult and 1 pediatric)

2 Nurse Educator graduate students

1 Lab coordinator

**Skills stations for review of nursing skills
and checklists**

N4902 - Critical Care Simulation



SUMMER I ELECTIVE

Structure of the Course (Cont.)

Virtual Simulations for Practicing Code

4 Simulators: iStan, ECS, PediaSIM, and a BabySIM

PNCIs: Adult and Pediatric Focus

DKA

Code Blue

ARDS

Asthma

Head Injury & Death

Post Operative Care

Blood Transfusion & Anaphylaxis

N4902 - Critical Care Simulation



SUMMER I ELECTIVE

Process of Simulations

Predetermined Nursing roles with assigned specific job

Descriptions:

**Assessment Medication Primary
Documentation (Float)
Unlicensed Assistive**

Prep Work - Primary Nurse = Leader of the Group

**Plan: Concept map with a human Body
Problems, symptoms → interventions
Drug Medication tables
Nursing diagnosis text + drug Books**

W002 - Critical Care Simulation



SUMMER I ELECTIVE

Process of Simulations (Cont.)

**Simulation: Faculty facilitators and entries at bedside
Simulated Clinical Experiences (SCEs)
Hospital-like environment, documentation, SBAR**

**Debriefing: Followed the Objectives of the SCE's
Quality of care, outcomes**

**Reflection: Guided by Lasater Clinical Judgment Rubric
(Lasater, 2007)**



Texas Woman's University

DENTON • DALLAS • HOUSTON

Matrix of Rotations

N4902 - Critical Care Simulation
Summer 2009

	Week 1		Week 2		Week 3		Week 4	
	9-Jun	10-Jun	16-Jun	17-Jun	23-Jun	24-Jun	30-Jun	1-Jul
	9a-2p	9a-2p	9a-12:30p	9a-12:30p	9a-12:30p	9a-12:30p	9a-12:30p	9a-12:30p
Skills	CBA	Adult - A	Pedi - P	Adult - D	Pedi - M	Adult - U	Pedi - A	Adult - F
Skills	Adult - A	Adult - U	CBA	Adult - P	Pedi - D	Adult - M	Pedi - U	Adult - A
Skills	Adult - U	Adult - M	Pedi - A	CBA	Pedi - P	Adult - D	Pedi - M	Adult - U
Skills	Adult - M	Adult - D	Pedi - U	Adult - A	CBA	Adult - P	Pedi - D	Adult - M
Skills	Adult - D	Adult - P	Pedi - M	Adult - U	Pedi - A	CBA	Pedi - P	Adult - D
Skills	Adult - P	Adult - F	Pedi - D	Adult - M	Pedi - U	Adult - A	CBA	Adult - P
Skills	Adult - A	Adult - D	Pedi - P	Adult - M	Pedi - U	Adult - A	CBA	Adult - P
Skills	Adult - U	Adult - A	CBA	Adult - P	Pedi - M	Adult - U	Pedi - A	Adult - D
Skills	Adult - M	Adult - U	Pedi - A	CBA	Pedi - P	Adult - M	Pedi - U	Adult - A
Skills	Adult - P	Adult - M	Pedi - U	Adult - A	CBA	Adult - P	Pedi - M	Adult - U
Skills	CBA	Adult - P	Pedi - M	Adult - U	Pedi - A	Adult - D	Pedi - P	Adult - M
Skills	CBA	Pedi - A	Adult - P	Pedi - D	Adult - M	Pedi - U	Adult - A	Pedi - F
Skills	Pedi - A	Pedi - U	CBA	Pedi - P	Adult - D	Pedi - M	Adult - U	Pedi - A
Skills	Pedi - U	Pedi - M	Adult - A	CBA	Adult - P	Pedi - D	Adult - M	Pedi - U
Skills	Pedi - M	Pedi - D	Adult - U	Pedi - A	CBA	Pedi - P	Adult - D	Pedi - M
Skills	Pedi - D	Pedi - P	Adult - M	Pedi - U	Adult - A	CBA	Adult - P	Pedi - D
Skills	Pedi - P	Pedi - F	Adult - D	Pedi - M	Adult - U	Pedi - A	CBA	Pedi - P
Skills	Pedi - A	Pedi - D	Adult - P	Pedi - M	Adult - U	Pedi - A	CBA	Pedi - P
Skills	Pedi - U	Pedi - A	CBA	Pedi - P	Adult - M	Pedi - U	Adult - A	Pedi - D
Skills	Pedi - M	Pedi - U	Adult - A	CBA	Adult - P	Pedi - M	Adult - U	Pedi - A
Skills	Pedi - P	Pedi - M	Adult - U	Pedi - A	CBA	Pedi - P	Adult - M	Pedi - U
Skills	CBA	Pedi - P	Adult - M	Pedi - U	Adult - A	Pedi - D	Adult - P	Pedi - M

A = Assessment Nurse
P = Primary Nurse
M = Medication Nurse
F = Float Nurse

CBA = Computer Based Assignment
D = Documentation Nurse
U = Unlicensed Assistive Personnel (UAP)

Week 1 - Skills, DKA & Code Blue
Week 2 - ARDS & Asthma
Week 3 - Head Injury & Death
Week 4 - Complications of Care & Blood Transfusions

Lasater Clinical Judgment Rubric (LCJR)

Self-Reports following each SCE debriefing N4902 - Critical Care Simulation

Noticing

Interpreting

Responding

Reflecting



SUMMER I ELECTIVE

Each of 11 items rated as:

1 thru 4 points

(4) Exemplary, (3) Accomplished, (2) Developing, (1)

Beginning

Self-Evaluation Measures analyzed twice:

Baseline: Primary Nurse

Final time: Primary – Medication - Assessment

Measurement Processes of the Course

- **Professional Accountability**
 - Learner will actively participate in the preparation and care during 8 SCEs, calculated by presence & standards of professional behavior.
- **Clinical Judgment**
 - Learner will reflect on a summative self- evaluation (peer & faculty agreement) following each debriefing session with an average of “accomplished” in all categories.

Measurement Processes of the Course (Cont.)

- **Competency of Nursing Skill Behaviors**
 - Learner will maintain a percentage of skills performed at competent/expert levels during the preparatory skills lab day and SCE according to designated roles.
- **Critical Thinking**
 - Learner will earn a grade of 75% or more on 2 assigned virtual simulation experiences.

Outcomes of Course Participants IRB Exempt Status

**Grade Point Averages before course and after
Senior II courses**

**Standardized Exams after Junior II, Senior I and
Exit Exam (at curriculum end)**

**Differences in LCJR between baseline and
completion of course as primary nurse
(medication and assessment)**

N4902 - Critical Care Simulation



SUMMER I ELECTIVE

Research Question 1

Were there improved student perceptions of clinical judgment while using the Lasater Clinical Judgment Rubric Scoring Sheet upon completion of the course?

N4902 - Critical Care Simulation



SUMMER I ELECTIVE

Were there improved student perceptions of clinical judgment while using the Lasater Clinical Judgment Rubric (LCJR) Scoring Sheet upon completion of the course?

Descriptive Statistics: LCJR

	N	Minimum	Maximum	Mean	Std. Deviation
Noticing1	22	2.00	4.00	3.0459	.50690
Interpreting1	22	2.00	4.00	2.8182	.52430
Responding1	22	2.25	3.75	2.8827	.46079
Reflecting1	22	2.00	4.00	3.1591	.47274
Overall1	22	2.45	3.91	2.9618	.41375
Noticing2	22	2.00	4.00	3.1214	.46601
Interpreting2	22	2.00	4.00	3.0682	.49511
Responding2	22	2.00	4.00	3.1250	.50444
Reflecting2	21	3.00	4.00	3.5238	.46033
Overall2	22	2.44	4.00	3.1836	.42257
Valid N (listwise)	21				

Were there improved student perceptions of clinical judgment while using the Lasater Clinical Judgment Rubric Scoring Sheet upon completion of the course?

Paired Samples Statistics of Overall Scores

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	OverAllAdd1	32.3529	17	4.87264	1.18179
	OverAllAdd2	36.0588	17	4.62967	1.12286

Results 1 (a)

Paired Sample t tests revealed that students Overall scores **were significantly improved after completion of the course.**

Were there improved student perceptions of clinical judgment while using the Lasater Clinical Judgment Rubric Scoring Sheet upon completion of the course?

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Noticing1 - Noticing2	-.07545	.61581	.13129	-.34849	.19758	-.575	21	.572
Pair 2	Interpreting1 - Interpreting2	-.25000	.66815	.14245	-.54624	.04624	-1.755	21	.094
Pair 3	Responding1 - Responding2	-.24227	.65584	.13983	-.53305	.04851	-1.733	21	.098
Pair 4	Reflecting1 - Reflecting2	-.35714	.55097	.12023	-.60794	-.10634	-2.970	20	.008
Pair 5	Overall1 - Overall2	-.22182	.52193	.11127	-.45323	.00959	-1.993	21	.059

Results 1 (b) Domains

- Paired Sample t test revealed that student “reflecting” scores were significantly improved after completion of the course
 - (p = .008).
 - Effect size = .66 moderate
- Other scores (noticing, interpreting, responding, and overall) were not significantly different after completion of the course.

Research Questions 2 and 3

- **2 Prior to the elective (NURS4902), was there a difference between GPA's among the students who attended the elective when compared to their cohort of classmates who did not attend the elective?**
- **3 At the end of their nursing program, was there a difference between GPA's among the students who attended the elective course (NURS4902) when compared to their cohort of classmates who did not attend the elective?**

Results: 2 and 3 GPA's

GPA's	Prior to Course	End of Program	Difference
Elective	3.38	3.39	+ 0.01
Cohort	3.46	3.47	+ 0.01

Texas Woman's University

DENTON • DALLAS • HOUSTON

Tests of Within-Subjects Contrasts

Measure: Measure_1

Source	factor1	Type III Sum of Squares	df	Mean Square	F	Sig.
factor1	Linear	.003	1	.003	1.052	.307
factor1 * Group	Linear	.001	1	.001	.370	.544
Error(factor1)	Linear	.268	109	.002		

Tests of Between-Subjects Effects

Measure: Measure_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	1656.103	1	1656.103	11628.058	.000
Group	.224	1	.224	1.572	.213
Error	15.524	109	.142		

Results: 2 and 3

- **GPA scores were examined for both changes over time (at the end of nursing program) and difference between groups (attend or not attend the elective). The repeated measure ANOVA revealed that there is no significant difference in GPA over time, time*group and by group itself.**

Research Question 4

Was there a difference in standardized specialty exam scores taken prior to the elective (NURS4902) in the students who attended the course when compared to their cohort of classmates who did not attend the elective?

4. Was there a difference in standardized exam scores taken prior to the elective (NURS4902) in the students who attended the course when compared to their cohort of classmates who did not attend the elective?

Standardized Exam	Junior II	MED-SURG (Specialty)	Difference
Cohort	826.69	878.20	51.51
Elective	793.64	834.32	40.68
Difference	33.05	43.88	

ANOVA Between Groups Junior II Med-Surgical and Med-Surgical Senior I

		Sum of Squares	df	Mean Square	F	Sig.
Junior2_Custom_Med_Surg	Between Groups	2756.030	1	2756.030	.088	.767
	Within Groups	3442502.746	110	31295.480		
	Total	3445258.777	111			
Med_Surg_HESI	Between Groups	19282.619	1	19282.619	.750	.388
	Within Groups	2827643.095	110	25705.846		
	Total	2846925.714	111			

Results 4 (a)

- One Way ANOVA revealed that there was **no difference in standardized exam scores between Junior 2 Custom and Med-Surgical Specialty** taken prior to the elective in students who attended the course when compared to their cohort who did not attend.

4. (b) Was there a difference in standardized specialty exam scores and the standardized Exit 1 exam among the students who attended the course when compared to their cohort of classmates who did not attend the elective?

Standardized Exam	MED-SURG (Specialty)	Exit 1 - Prior to Graduation	Difference
Cohort	878.20	941.876	63.676
Elective	834.32	893.45	59.13
Difference	43.88	48.426	

4. (b) Was there a difference in standardized specialty exam scores and the standardized Exit 1 exam among the students who attended the course when compared to their cohort of classmates who did not attend the elective?

**Pass/Fail Rates of Exit 1 Exams of Those
with <850 in Med-Surgical Specialty Exam**

Stand. Exam	MED-SURG (Specialty) <850	Exit 1 - Prior to Graduation <850	Exit 1 - Prior to Graduation >850
Cohort	37 (35%)	10 (27%)	27 (73%)
Elective	11 (50%)	7 (64%)	4 (36%)

4. (b) Was there a difference in standardized specialty exam scores taken prior to the elective (NURS4902) in the students who attended the course when compared to their cohort of classmates who did not attend the elective?

Pass/Fail Rates of Exit 1 Exams of Those with >850 in Med-Surgical Specialty Exam

Stand. Exam	MED-SURG (Specialty) >850	Exit 1 – End of Curriculum <850	Exit 1 – End of Curriculum >850
Cohort	52 (48%)	3 (6%)	49 (94%)
Elective	11 (50%)	2 (18%)	9 (82%)

**ANOVA Between Groups
Med-Surgical (specialty) and Exit I Exam**

Results 4 (b)

- One Way ANOVA revealed that there was no statistical difference **between Med-Surgical Specialty Exam (Senior I) and Exit I Exam among** students who attended the course when compared to their cohort who did not attend.

Research Question 5

Was there a difference in the exit standardized test scores among the students who attended the elective (NURS4902) course when compared with their cohort of classmates who did not attend the elective?

850 Passing Grade for Exit I

Exit Exam I	Pass	Fail	
Cohort	74 (84.1%)	14 (15.9%)	88
Elective	13 (59.1%)	9 (40.9%)	22

Descriptives of Exit Exam I and Exam II

		N	Mean	Std. Deviation
			Upper Bound	Lower Bound
HESIExitExam1	Attended Elective Course	22	893.4545	118.81628
	Not Attended Elective Course	89	941.8764	84.99195
	Total	111	932.2793	94.07455
HESIExitExam2	Attended Elective Course	9	883.8889	93.34673
	Not Attended Elective Course	16	876.5625	129.15416
	Total	25	879.2000	115.51154

ANOVA Exit I and Exit II

		Sum of Squares	df	Mean Square	F	Sig.
HESIExitExam1	Between Groups	41359.247	1	41359.247	4.836	.030
	Within Groups	932143.0	109	8551.772		
	Total	973502.3	110			
		42				
HESIExitExam2	Between Groups	309.174	1	309.174	.022	.883
	Within Groups	319920.8	23	13909.601		
	Total	320230.0	24			
		00				

Results 5

- **One way ANOVA revealed that there was a significance difference in the HESI Exit Exam #2 standardized test score among the students who attended the elective (NURS4902).**
- **The course elective had lower HESI Exit Exam #2 scores than classmates who did not attend the elective but no significance difference in the HESI Exit Exam #1 standardized test score.**

Conclusion

There were no statistically significant differences between the 2 groups on GPA's and Standardized Exams after Junior 2, Senior 1, and Exit I Exam Standardized Test Scores.

There was a statistically significant improvement in overall critical thinking on the LCJR and a statistically significant improvement in “reflecting” at the end of the course.

Limitations Measuring Outcomes

- Small sample of participants in elective
- Passing grade had to be “accomplished” in all areas
- Not all students rotated into primary nurse’s role twice
- Many intervening variables (to influence GPAs and standardized tests) were possible between the end of elective & end of the curriculum
- Poor voluntary responses on LCJR to compare participants and peers prior to end of curriculum
- Lost data from some students skipping questions
- Unknown student reasons for enrolling in the course

Recommendations for Future

- Use a standardized test that matches the Med-Surgical Specialty test following the course
- Open the course to more students in order to have more equivalent comparisons between groups.
- Explore reasons for registering in the course
- For future analysis, match students according to performance scores in standardized tests.

