

THE EFFECTIVENESS OF A COMPUTERIZED ADAPTIVE PROGRAM ON ACADEMIC SUCCESS IN A MEDICAL-SURGICAL NURSING COURSE



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PROGRAM OBJECTIVES:

- ▶ Discuss the use of computerized adaptive testing as a mechanism of formative assessment in nursing education.
- ▶ Explain the effectiveness of computerized adaptive testing on student success in nursing education.
- ▶ Conflict of Interest Statement: Dr. Rose Schwartz is on the Advisory Board for Wolters Kluwer Passpoint.



FORMATIVE ASSESSMENT

- Learners should take control of their learning
- Provides feedback
- Promotes self-reflection, self-evaluation and self correction
- Helps student focus on content at hand rather than final grade
- Places facts within a conceptual scaffold to identify patterns, reach reasonable conclusions and adapt their knowledge base.



COMPUTERIZED ADAPTIVE TESTING

Computerized adaptive testing (CAT) is a form of a computer-based test that adapts to the examinee's ability level.



COMPUTERIZED ADAPTIVE TESTING

- Blends computer technology modern measurement models
- Question difficulty is adjusted based upon a students prior answer.
- Difficulty level – 50% chance of answering correctly
- Goal – determine true ability level.
- Precision increases as more questions are answered.
- National Council Licensure Exam (NCLEX) utilizes CAT



PURPOSE

- Determine the effectiveness of utilizing a computerized adaptive testing program as a formative assessment strategy to promote active learning and to improve academic success in a medical surgical nursing course.



How's My Class Doing?

Jump directly to:

Class Performance >

Strengths & Weaknesses >

Overall Usage >

Specific Misconceptions >

Assignment Results >

Student Usage >

Enroll Students >

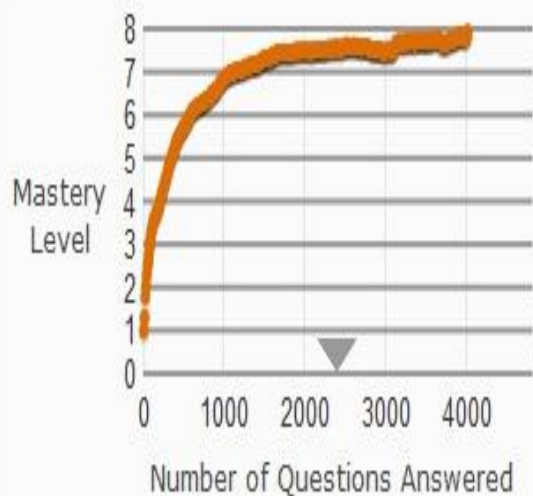
Nursing 330 A FA 2014 - Fall 2014

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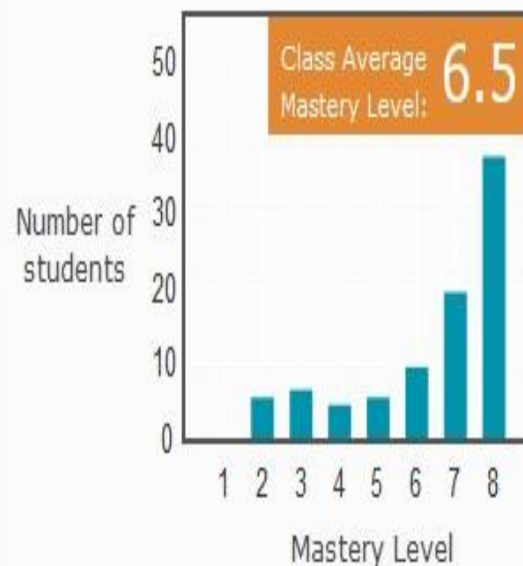
Class Performance

Mastery Level vs. # of Questions Answered



▼ Class average # of questions answered

Mastery Level Histogram



Strengths & Weaknesses

Click on a topic to view your students' performance question by question.

Strong Topics:

Topic	Mastery	1	2	3	4	5	6	7	8
Chapter 39: Oxygenation Based on 69 students	Class Mastery Level: 6.97								
Chapter 38: Bowel Elimination Based on 65 students	Class Mastery Level: 6.95								
Chapter 33: Activity Based on 73 students	Class Mastery Level: 6.88								

Weak Topics:

Topic	Mastery	1	2	3	4	5	6	7	8
Chapter 28: Complementary and Alternative Therapies Based on 4 students	Class Mastery Level: 1								
Chapter 3: Health and Illness Based on 4 students	Class Mastery Level: 1.25								
Chapter 17: Documenting, Reporting, Conferring, and Using Informatics Based on 10 students	Class Mastery Level: 1.3								

METHOD

- Students enrolled in Medical-Surgical Nursing I were recruited.
- All students in the class were required to complete a minimum of 50 CAT questions per chapter.
- Mastery level was calculated by the computerized adaptive program.
- All students in the class were eligible for additional points to their exam grades based upon mastery level.
- Students were not penalized if they chose not to participate in the study.



DATA COLLECTION

- Demographic Questionnaire
- Exam Grades
- HESI conversion scores
- Number of questions completed per exam and overall
- Average mastery level per exam and total



SAMPLE

- 123 Junior BSN nursing students in Medical Surgical Nursing I
 - Age:
 - 21.40 mean
(18-37, SD 2.974)
 - Gender:
 - 8.1% male, 91.9% female
 - Race:
 - 72.4% white, 27.6% (black/African American, Asian and Pacific Islander)



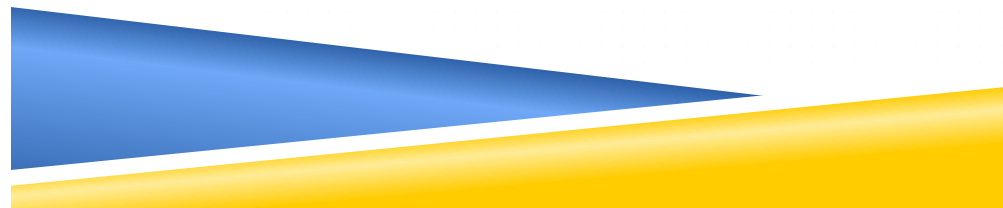
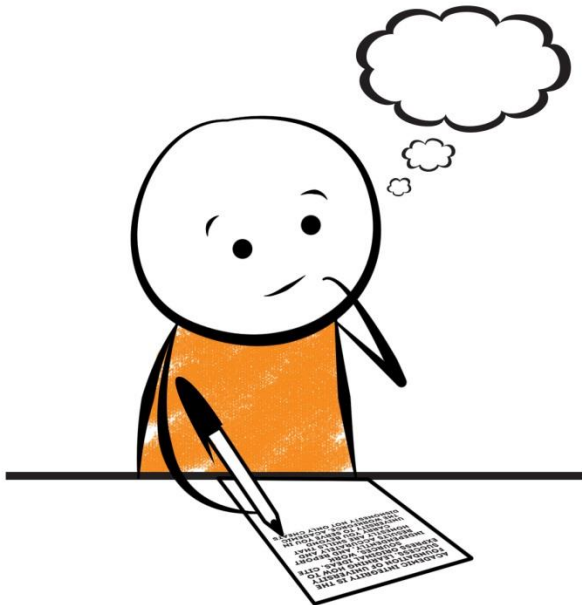
SAMPLE

- GPA:
 - 3.476 mean (3.0-3.92, SD 0.25)
- Working:
 - 56% worked on average 12 hours/week (3-35, SD 7.4)



TESTING DATA

	Mean	Minumum	Maximum	Range	SD
Exam I	85.55	70.0	97.5	27.5	5.94
Exam II	86.20	63.2	100	36.8	7.25
Exam III	81.14	60.0	93.3	33.3	6.97
HESI	84.74	60.6	100	44.4	9.37



TESTING DATA

- Final Grade
 - Mean – 87.58
 - Range – 30.5
(66.8- 97.3)
- Number of CAT questions
 - Mean – 1969
 - Range – 4360
(71- 4431)
- Mastery Level
 - Mean – 6.29
 - Range – 7 (1.0-8)



RESULTS

- There was a strong positive relationship between number of questions completed and mastery level.

	Exam 1 mastery level	Exam 2 mastery level	Exam 3 mastery level	Final mastery level
Exam 1 # questions	$p < .001$ $r = .85$			
Exam 2 # questions		$p < .001$ $r = .89$		
Exam 3 # questions			$p < .001$ $r = .89$	
Total # questions				$p < .001$ $r = .84$



RESULTS

- There was a weak positive correlation between Exam 2 grades and mastery level ($p=.009$, $r=.22$)
- There was no correlation between Exam 1 & 3 grades and number of questions or mastery level



RESULTS

- There was no correlation between HESI score and total number of questions or total mastery level.
- There was a weak positive correlation between total weighted grade and average total mastery level ($p=.005$, $r=.23$)



ADDITIONAL ANALYSIS

- There was a weak negative relationship between working status and final course grade ($p=.25$, $r=-.20$)



ADDITIONAL FINDINGS

	Exam 1 # questions	Exam 2 # questions	Exam 3 # questions	HESI total number of questions
Mean	910.34	455.33	455.72	1969.86
Std. Deviation	464.6	271.2	334.6	1065.3
Minimum	22	10	10	71
Maximum	1923	1075	1486	4431



QUALITATIVE COMMENTS

- Reported that CAT was helpful in preparing for exams.
- Reported that they had limited amount of time to reach the mastery level.



DISCUSSION

- Weak correlation between Exam 2 grade and final grade and mastery level.
- The number of questions completed by the students decreased over the course of the semester.



QUESTIONS







