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# NCLN MONTHLY NEWSLETTER

## Testing Analysis in Pre-Licensure Nursing Education

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### **Nuts and Bolts of Test Analysis**

When analyzing the exams in nursing courses, I have a few vital elements for review. The process is started by looking at how each question performed.

First, reviewing the % that answered the question correctly. This should vary on the test as there should not be too many “easy” questions nor too many “difficult” questions. There are no hard and fast rules on what is acceptable but use your judgment about the content and how it was tested. I tend not to have more than 2-3 that 100% get correct and usually that is content that is a priority for them to know. I look more deeply at questions that have below 60%.

Next comes the point biserial. This indicates how well the item discriminated between the testers (analysis of responses to the lower scoring students versus the higher scoring students). The ideal point biserial is 1.0; however, that is rarely achieved. You definitely want a positive number as a negative indicates more of the lower scoring students got it correct, and the higher scoring students did not. The closer to zero means there was very little differentiation between the two groups of students. With lower % questions if the point biserial indicates discrimination then can be a good test question but is more difficult. I would then read the item to make sure there were no issues with the question (i.e. grammar/spelling, no true correct answer, not testing what intended, etc.). These two statistics give me a good idea if any scoring adjustments are needed, such as “dropping” the question or taking more than one answer. You should have a good reason to make scoring adjustments to test questions to maintain the validity of the test.

Examples

Example reports utilized from ExamSoft testing

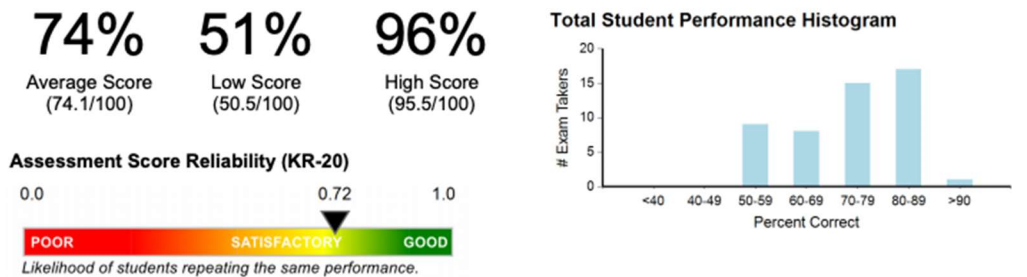
**QUESTION PERFORMANCE** (Items; Shows Up to 5 Distractors/Choices per Question)

Seq #	Item ID	Item Stem	Correct	Upper 27%	Lower 27%	Point BI	Serial Index	Response Frequencies			
								A	B	C	D
1	1474	Which of the followi...	90%	93%	73%	0.22	0.20	*45	0	1	4
2	1475	Which of the followi...	74%	100%	53%	0.46	0.47	7	*45	*42	2
3	1476	The client's sodium...	72%	79%	53%	0.27	0.25	*36	4	7	3
4	1477	Which of the followi...	96%	100%	87%	0.34	0.13	*48	1	0	1
5	1478	A client with a 3-da...	36%	50%	20%	0.24	0.30	12	14	*18	6
6	1479	A client is receivin...	80%	100%	47%	0.54	0.53	*40	6	2	2
7	1480	A client is admitted...	84%	93%	80%	0.22	0.13	0	3	5	*42
8	1481	A client had a large...	80%	100%	67%	0.28	0.33	1	5	*40	4
9	1482	The nurse has been a...	86%	100%	87%	0.21	0.13	5	*43	2	0
10	1483	A client is admitted...	78%	93%	53%	0.37	0.40	0	*39	9	2

Analysis for further improvement of the test includes the responses to each item and the KR-20. For each item look at the percentage/number that answered for each option. Any option that has a frequency of zero should be revised. All options should be distracting poorer testers.

The KR-20 indicates how consistent the results are and how well it is measuring what is intended. The ideal score would be 1.0, but 0.5 is considered acceptable for instructor made exams. Reasons a KR-20 may be low is the testers were all at the same level, the test covered a variety of content, or there were lots of difficult questions.

**ASSESSMENT PERFORMANCE**



Here is a succinct reference for test analysis statistics

<https://www.creighton.edu/sites/www12.creighton.edu/files/PfT-Exam%20Analysis.pdf>

**Using Test Blueprints**

Another valuable aspect to reliable tests is to utilize a test blueprint. This can be done on paper or through testing software. If using testing software it is much easier to retrieve data regarding the blueprint. Many in pre-licensure programs utilize similar categories such as levels of Bloom’s taxonomy (as NCLEX test at application and analysis levels), NCLEX test plan categories, and the Nursing Process. Using a blueprint ensures that each test is balanced and testing what is intended. Blueprints can be utilized for tracking across a curriculum as well as compared to standardized testing.

# Blueprint

	Number %	
[-] Cognitive Level	0	-
[-] Analysis	30	46.00
[-] Application	36	55.00
[+] Integrated Processes	0	-
[-] NCLEX Test Plan	0	-
[-] Basic Care and Comfort	7	10.00
[-] Health Promotion and Maintenance	2	3.00
[-] Management of Care	15	23.00
[-] Pharmacological and Parenteral Therapies	6	9.00
[-] Physiological Adaptation	11	16.00
[-] Psychosocial Integrity	2	3.00
[-] Reduction of Risk Potential	18	27.00
[-] Safety & Infection Control	4	6.00
[-] Nursing Process	0	-
[-] Assessment	12	18.00
[-] Diagnosis/Analysis	8	12.00
[-] Evaluation	11	16.00
[-] Implementation	19	29.00
[-] Planning	14	21.00

I also provide the test blueprint to senior students to assist them in their test preparation and post-test remediation. The blueprint contains the information for each question to help focus the students' study and allows them to practice similar types of questions. The students receive the topic or title of the question, and then the other categories from the blueprint for each item. The students can use the information pre-test for thinking about how that content might be tested and used in nursing practice. For post-test the students are advised to review the test blueprint noting the questions missed to look for trends to see if or what the weaker areas are in their testing either by content or category.

## QUESTION

● CORRECT   
 ■ INCORRECT   
 ■ PARTIAL CREDIT

1 HAIs-SSI

*Learning Outcomes: Reduction of Risk Potential, Implementation, Analysis*

2 CA Compl

*Learning Outcomes: Physiological Adaptation, Diagnosis/Analysis, Analysis, Other Alternate Format*

3 impend death

*Learning Outcomes: Physiological Adaptation, Assessment, Analysis, Other Alternate Format*

4 Chemo complicat

*Learning Outcomes: Reduction of Risk Potential, Implementation, Analysis, Other Alternate Format*

5 Allergic reaction

*Learning Outcomes: Pharmacological and Parenteral Therapies, Implementation, Analysis, Other Alternate Format*

6 abd surgery

*Learning Outcomes: Physiological Adaptation, Assessment, Application, Other Alternate Format*

7 poeriop labs

*Learning Outcomes: Reduction of Risk Potential, Diagnosis/Analysis, Application, Other Alternate Format*

8 impend death

*Learning Outcomes: Psychosocial Integrity, Implementation, Communication and Documentation, Application*

9 palliative care

*Learning Outcomes: Basic Care and Comfort, Planning, Application*