Effectiveness of Adaptive Testing in an Elective NCLEX-RN Preparation Course

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Session Objectives

- Describe the role of adaptive testing in nursing education.

- Describe the process for incorporating adaptive testing into an elective online NCLEX preparation course.

- Identify the benefits and limitations of adaptive testing in an elective online NCLEX preparation course.
Adaptive Testing

- Adaptive testing systems are a form of computer-based test programs that adapt to the examinee's level of understanding. Programs for nursing are comprised of a large database of questions in multiple formats.
- Adaptive testing programs allow students to achieve mastery levels of nursing content at their own pace and time frame.
- As students answer questions, adaptive testing programs quickly determine current knowledge and delivers the following questions at that student’s appropriate difficulty level.
  - To achieve a higher mastery level, students must answer the more difficult questions correctly.
Adaptive Testing (cont.)

- Allows for instructor assigned or student independently created quizzes and/or exams.
  - Assign content area (concepts, topics, or client needs)
  - Assign mastery level
  - Assign time frame/due date
  - Assign number of questions per quiz (student) or exam (instructor or student)
- Answer key with rationale and feedback is available immediately.
  - Broken down by topic
  - Content remediation links
- Reports: Overall class and individual students.
Background

- NCLEX pass rates declining.
- Search for alternative method(s) of teaching to improve pass rates.
- Redesign of an online, elective Preparation for NCLEX course incorporating adaptive testing.
- Literature is limited regarding adaptive testing is nursing education.
- Further research needed to support the effectiveness of adaptive testing in nursing education.
Implementation

- Ohio University School of Nursing, Regional Campus.
  - ADN, LPN-RN transition, BSN, A-BSN
- Open to students enrolled in final semester of the nursing program.
- Preparation for NCLEX-RN is a 15 week elective, online course.
  - 2 credit hour
Course Objectives

- Review essential nursing content that aligns with the NCLEX-RN test plan and nursing program curriculum.
- Demonstrate improved knowledge related to content and competencies essential for entry into practice as a Registered Professional Nurse.
- Further enhance student test taking skills at the application, synthesis and analysis levels.
- Through analysis, students will identify his or her remediation needs and be capable of developing an individualized study plan for final NCLEX preparation.
- Students will recognize his or her potential for passing the NCLEX-RN.
- Intensify the student’s sense of confidence and competence to pass NCLEX on the first attempt.
- Increase technology fluency through distance learning strategies.
Methods to Meet Course Objectives

- Adaptive testing
- Critical thinking activities
- Various review methods
- Self-analysis
- Assignments compliment required nursing courses
Comprehensive Exams

- Three comprehensive exams to evaluate student readiness for NCLEX-RN Exam.
  - Exam One. At start of course, 75 questions: evaluate where the student is at the beginning of the course. No assigned mastery level.
  - Exam Two. Mid-way through the course, 150 question: second evaluation of readiness and comparison from beginning of course. Points are based on achieved mastery level.
  - Final exam, 265 questions: final evaluation of readiness and provides data to develop individualized study plan. Points are based on achieved mastery level.
Assigned Weekly Quizzes

- Nursing Concept Quizzes (total of 7 at 10 points each)
- Nursing Topics Quizzes (optional)
- Client Needs/NCLEX Test Plan Quizzes (total of 16 at 20 points each)
  - The content of the NCLEX-RN Test Plan is organized into four major Client Needs categories. Two of the four categories are divided into subcategories, making 8 categories/subcategories.
  - Students complete two quizzes from each of the 8 categories under “Client Needs”.
- Self Identified Quizzes (total of 6 at 10 points each)
  - Students will complete at least 3 self-selected quizzes after Exam One and after Exam Two, selected from areas of weakness identified in the self-analysis written assignments.
Self-Analysis

- Following each exam, students complete a self-analysis of the exam results.
- Strengths and weaknesses are identified to guide the student in self-assigned quizzes from “Nursing Concepts” or “Nursing Topics”.
- This information can assist the student in developing an individualized study plan for final NCLEX-RN preparation.
# Self-Analysis

Assignment One: N2005 Results Analysis of "Where am I now-beginning assessment" Exam

<table>
<thead>
<tr>
<th>How long did it take to complete the exam?</th>
<th>Overall Score: what was your mastery level?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify your strengths:</td>
<td>1.</td>
</tr>
<tr>
<td>List 3 areas identified as strengths, include score for each area</td>
<td>2.</td>
</tr>
<tr>
<td></td>
<td>3.</td>
</tr>
<tr>
<td>Identify your strengths and weak areas:</td>
<td></td>
</tr>
<tr>
<td>Review/Analyze all your answers from the exam.</td>
<td></td>
</tr>
<tr>
<td>What areas/topics did you get correct and you felt very confident on?</td>
<td></td>
</tr>
<tr>
<td>Are there ones that you got correct but guessed on and really did not know the content?</td>
<td></td>
</tr>
<tr>
<td>Certain topics</td>
<td></td>
</tr>
<tr>
<td>Look at the ones that you got wrong:</td>
<td></td>
</tr>
<tr>
<td>List at least 3 areas/topics that you identified as weaknesses.</td>
<td></td>
</tr>
<tr>
<td>This could be something that PassPoint identified by you achieving lower scores or something as you were taking the exam, you did not feel confident in or trends that you see through your analysis.</td>
<td></td>
</tr>
<tr>
<td>Identify 3 self-assigned quizzes from “Nursing Topics” based on your identified weak areas.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.</td>
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<td></td>
<td>2.</td>
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<td>3.</td>
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</tbody>
</table>
Individualized Study Plan for Final NCLEX Preparation

- Instructor developed
- Student developed
NCLEX recommendation:
1. You have reached the assigned levels for all assigned quizzes, continue to take quizzes to increase level in all concepts and client needs areas to highest level.

2. I see that you have taken a few quizzes under Concepts that are not assigned. Your levels are low; it is recommended that you reach at least the minimal level for success in all of these areas before taking NCLEX.

3. Take all topics quizzes and work to achieve at least the minimal level for success before you take NCLEX. You have not taken any to date.

4. You have not reviewed much remediation content; there is a lot to learn from this. I recommend you to review the rationales and remediation content as you prepare for your NCLEX.

5. Continue to take exams.
The ultimate goal of taking the NURS 2005 Preparation for NCLEX-RN course is to pass the NCLEX-RN exam on my first attempt. I understand that those that create and follow a study plan do better on the exam. An important part of this plan is identifying my areas of strengths weaknesses. The following analysis is based on my performance throughout the course and will be used to develop an individualized study plan that can be used to prepare me for NCLEX-RN success.

1. I have identified that I do well in the following Client Need categories (List at least 3).

2. I have identified the following Client Need categories and understand that I need to schedule more study time in these categories.

3. I have identified that I do well in the following Nursing Topic categories (List at least 3).

4. I have identified the following Nursing Topic categories and understand that I need to schedule more study time in these categories.

5. I have identified that I do well in the following Nursing Concept categories (List at least 3).

6. I have identified the following Nursing Concept categories and understand that I need to schedule more study time in these categories.

7. I have identified how I learn best (audio, visual, reading comprehension, etc.) and based on this, I plan to use the following tools between graduation and my scheduled test date to help with my focused study plan.
Instructor screen captured video/audio recordings are provided demonstrating how to access the program, instructions on using the program, tips for success and how to use other resources available on the program.

Optional quizzes are listed that compliment exams and assignments in their required nursing courses.

Resources, readings and links are posted throughout the course related to test taking strategies, NCLEX preparation and processes, NCLEX-RN Test Plan and other information deemed useful to student success.

Course calendar.
Method

- Participants in the study were a convenience sample of associate degree nursing students enrolled in the final semester of the program and who completed an elective, online NCLEX-RN preparation course.
- Through a retrospective study data was collected on first-time NCLEX-RN pass rates for the students who completed the course and were compared to the pass rates of their overall class cohort.
- Student feedback related to the course design and implementation was gathered as part of the course evaluation process.
# Results

<table>
<thead>
<tr>
<th></th>
<th>Students that completed final semester (n)</th>
<th>Students that completed NCLEX-RN Prep Course (n)</th>
<th>Overall first time pass rate: students that completed final semester n (%)</th>
<th>First time pass rate: students that completed NCLEX-RN Prep Course n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cohort 1: Spring 2015</strong></td>
<td>42</td>
<td>13</td>
<td>34 (80.9%)</td>
<td>11 (84.6%)</td>
</tr>
<tr>
<td><strong>Cohort 2: Summer 2015</strong></td>
<td>54</td>
<td>26*</td>
<td>41 (75.9 %)</td>
<td>21 (80.8%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>96</td>
<td>39</td>
<td>75 (78.1%)</td>
<td>32 (82%)</td>
</tr>
</tbody>
</table>

* 29 students were enrolled in the course; 1 student was not enrolled in the final semester and 2 students did not complete the course.
Student Feedback

- “I am unbelievably excited to tell you, I passed boards!!!!!!! I want to thank you again for helping me through the last semester and especially through (standardized testing exit exam)! I am forever grateful to you!! I'm so glad I decided to take your NCLEX course!”
- “Just wanted to let you know that I passed the NCLEX. ...I also wanted to let you know that I mostly prepared with (the adaptive testing program) I really think (the adaptive testing program) helped me pass. Thanks so much for helping me prepare and pass the NCLEX!!”
- “I really believe that the adaptive quizzing program contributed to me passing NCLEX. Doing the questions and increasing my mastery level increased my confidence going into the exam. Increasing my mastery level became like a game and challenged me.”
Limitations of Study

- The small convenience sample from one university limits the ability to generalize the results to other populations.
- Difficult to control for the multiple variables that can impact a student’s success on the NCLEX-RN exam.
Conclusion

- The outcomes of the study support that adaptive testing can be an effective method for preparing students for success on the NCLEX-RN exam.
- NCLEX-RN Preparation course participants consistently had higher NCLEX-RN first-time pass rates than the overall class cohort.
- Course participants valued the adaptive testing learning experience and perceived that it was an effective method for preparing them for both comprehensive standardized exit exams and the NCLEX-RN exam.
- Participants reported that they felt more competent and confident to pass NCLEX-RN on the first attempt.
Benefits of Adaptive Testing: Students

- Improve student mastery of content through active learning.
- Improve study efficiency:
  - Students learn more efficiently because they do not waste time on material that is too easy or too hard.
  - Immediate feedback about their performance is broken down by topic to help students know exactly where to focus their study efforts.
- Students can access and take practice quizzes/exams as often as needed to achieve the assigned mastery level.
Benefits of Adaptive Testing: Students

- Improved test-taking skills:
  - Mimics NCLEX-RN style testing.
  - Can be used for independent studying and practice of test taking strategies.

- By making assignments correspond with required nursing course exams and assignments, students increase their learning for the nursing courses while preparing for the NCLEX-RN exam.

- Less stressful environment.

- Increased confidence in testing success.
Benefits of Adaptive Testing: Instructors

- Reports provide data on overall class and individual student usage and performance.
  - Data assists in identifying students at risk so those students can be individually advised.
  - Data assists in identifying strengths and weaknesses of class as a whole.
    - Information can be shared with faculty so weak areas can be addressed in the curriculum.
- Instructors have flexibility and multiple options in how to integrate into their course.
  - This allows them to best align the program usage with their teaching style and expectations.
- Easily incorporated into an online course format.
Limitations of Adaptive Testing

- Students motivation to use the program to its capacity is diminished when struggling in required nursing courses.
  - If mastery level assigned too high, student time requirements increase resulting in student frustration.
- Cost of the program.
- Requires internet access.
- Learning curve of the program when incorporated into an online format.
- Some aspects of adaptive testing can be labor intensive for the instructor depending on how assignments are developed.
Future Consideration

- Continue to modify and adapt the course to changes in the NCLEX-RN test plan.
- Continue to collect data to determine an assigned mastery level that best meets students needs without compromising NCLEX-RN success.
- Adapt the course to meet the needs of students in all programs within the school of nursing (ADN, LPN-RN, and BSN).
- Expand the research to include larger sample size as well as other types of nursing programs.

