

Case Study

Helping Students Achieve First-Time NCLEX Success

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Application of Nursing Theory | Fall 2013

SUMMARY OF FINDINGS

- Faculty reviewed the Misconception Alerts and reviewed these questions and topics in class with students.
- NCLEX pass rates were 100%.
- Students all used PassPoint and had an average overall quizzing ML of 4.0.

PassPoint Trial, Fall 2013

During the fall 2013 semester, Dr. Loan was co-teaching with Dr. Connie Lamb. Groups of senior BSN students. NSC 378 ($N=15$) were first semester seniors who will graduate in May 2014. NSC 496 ($N=31$) were 2nd semester seniors who graduated in December, 2013. Some of these NSC 496 students were among the NSC 378 students who participated in the PassPoint trial during spring/summer 2013.

PassPoint Trial, Spring 2013

Dr. Loan assumed the responsibilities of another ECU faculty member (Dr. Palmer) who had used prepU for the past 2-3 semesters and had been giving weekly prepU assignments. Dr. Palmer had a class in the spring of graduating seniors (NSC 496) who were using prepU to prepare for the NCLEX. They were given access to the trial version of PassPoint as they prepared for the NCLEX exam.

Eastern Kentucky Nursing Program

Students are in the program at Eastern Kentucky for 8 semesters, with the final 5 comprising the nursing program. In semester 6, students take a mid-curricular HESI exam.



Course

NSC 496 is an NCLEX prep course. All senior students in the 8th semester for the first time are required to take NSC 496. It is intended as a review of the nursing program and to help them prepare for NCLEX. If a student is required to repeat NSC 492 (Complex Client Health Care), they are not required to repeat NSC 496.

Course Requirements

NSC 496 (Applications of Nursing Theory) focuses on all nursing topics. This class was composed of 31 graduating seniors. The class comprised two sub-groups, traditional undergraduate baccalaureate students and second degree students who already had received a baccalaureate or higher degree. This course is graded as Satisfactory/Unsatisfactory.

Students were given a pretest of 75 items at the beginning of the semester. These questions, chosen from the PassPoint question library, were at low levels of difficulty (as determined by the student performance data within PassPoint). The decision to include lower-difficulty questions was made, in part, to help students become engaged with the system at the outset.

Students were assigned to do practice quizzes each week of the semester, across the 37 topics under the Nursing Topics category. They were required to meet a mastery level of 4 on each individual topic for a grade of satisfactory. In retrospect, this mastery level was much too low for graduating seniors. The mastery level will be set higher for subsequent semesters.

NCLEX PassPoint topics chosen for the earlier weeks of the semester were content areas identified as weaknesses from the mid-curricular HESI exam as well as from a survey completed by the students at the beginning of the semester. Students took their Exit HESI exam on September 25, 2013.

It was hoped that reviewing previously weak content areas might help them on their exit HESI exam. Students were required to have a score of 850 or higher on HESI for successful completion of their senior capstone course, NSC 492 Complex Client Care.

At the end of the semester, students were taken to the computer lab as a group and completed a 75-question practice exam. The outcome of this exam was not included as part of the semester grade.

Faculty Use

Course faculty reviewed the Misconception Alerts and reviewed these questions and topics in class with students on various class days. Assignments were compiled by faculty from misconception alert items and made available for students to review outside of class. These quizzes were not included in the course grade. Faculty reviewed with students the remediation features and demonstrated this feature at various times during the semester.

Additional Notes

Dr. Loan likes the fact that PassPoint allows students to build their confidence. Sometimes the difference between success and failure is that students are nervous and working, and practicing in prepU can help them overcome that anxiety. A big part of helping students prepare for the NCLEX is giving them the opportunity to mimic the experience (this is essentially the idea behind retrieval practice).

IRB

We completed an IRB application for this study which was approved by the ECU IRB in November 2013.

Survey Measures

Two surveys were sent to the fall 2013 group:

- a) a post-semester survey asking students to provide opinions on PassPoint and how much they used it to prepare for the NCLEX.
- b) a post-NCLEX survey which focused on NCLEX outcome.

A stipulation of the IRB application was that completion of the survey constituted consent to participate in the study and so only those students who completed at least one of the surveys were included in the data analysis. Completion rates for the surveys were low, with 12 students completing the post-semester survey, and 3 the post-NCLEX survey. Dr. Loan was surprised at the low response rates given the feedback and large number of unsolicited positive comments she received from students (about PassPoint).

NCLEX Pass Rate

In the fall 2013 semester, ECU had a 100% NCLEX pass rate. The pass rate at ECU is typically very high and was also 100% in 2012. Pass rates for prior years were: 2011, 96%; 2010, 98%, 2009, 99%. The average overall Kentucky statewide pass rate (for 2013) was 92% (for comparable degree programs).

PassPoint Usage and Mastery

Overall usage and ML for the practice quizzing section of PassPoint is shown in Table 1.

	N	Min	Max	M	SD
Number of Log Ins	12	24	86	42	17.68
Number of Quizzes	12	117	253	189.33	43.26
Number of Questions	12	1292	2251	1714.67	327.56
Mastery Level	12	3	4.50	4	.38
Remediation Views	12	0	81	11.75	22.63

Students answered an average of 1,714.67 ($SD = 327.56$) questions and achieved an average ML of 4 ($SD = .38$). Given the implementation within the course, we would expect the variance among students to be lower than usual. This is, in part, because there were specific course requirements set around PassPoint usage and so we see a more uniform pattern overall. For example, students were expected to achieve an overall ML of 4 across the 37 topics on which they took quizzes. The lowest overall ML was 3, and the highest was 4.5. A final, overall ML of 3 does not necessarily mean that a student did not complete the course requirements. The situation could arise where, if additional quizzes are taken in new topics or topics where the student needs more practice, the ML could decrease slightly. The overall ML is an overall average of all topics. The largest variance within this group was in remediation link views. Students looked at an average of 11.75 remediation links with one student looking at 81 and four students looking at none.

Practice Exam Usage and Mastery

Table 2 shows student usage and ML within the practice exam area of PassPoint. All students took at least one exam within PassPoint. The average number of exams was 2.33 and the average number of exam questions 175. Average exam ML was 7.87. Given the large standard deviation for the number of questions, the median question number was calculated. Median number of questions was 75 (as was the mode)—with 10 students taking just one 75-question exam.

	N	Min	Max	M	SD
Number of Practice Exams	12	1	15.00	2.33	4.03
Number of Practice Exam Questions	12	75	1125	175	302.26
Exam ML	12	7	8	7.87	.29

Overall practice exam usage was low; only one student used the practice exam feature to any significant extent and took 15 practice exams. All other students (except one who took

3 exams) took only the proctored practice exam (described above).

We used a Pearson product moment correlation to explore the relationship between PassPoint usage and subsequent ML (which is a reflection of the average question difficulty students are answering correctly). There were no significant correlations within the usage and ML variables. This is likely because of the low variance in ML. If all students are around the same ML and seem to stop there, it is harder to tease out possible differences which may be seen with a different implementation.

Course Outcomes

Course outcomes for the student group are shown in Table 3. The average course grade was 78.83 ($SD = 2.69$), the average mid-curricular HESI score was 975.83 ($SD = 94.81$) and the average exit HESI score was 1,008.58 ($SD = 85.83$).

	N	Min	Max	M	SD
Course Grade	12	74	85	78.83	2.69
Quiz Grade	12	63	78	70.92	5.82
Midterm Score	12	70	88	79.50	6.39
Final Exam (percentage)	12	76	90	81.08	4.27
HESI-Mid Curricular	12	772	1084	975.83	94.81
HESI Exit Exam	12	838.00	1108.00	1008.58	85.83

The HESI exam scores were positively correlated with one another (see Table 4), but not any of the other course outcomes or ML data. Of the group included in this analysis, only one scored below 850 on the mid-curricular HESI, and on the exit HESI, all but one student scored above 850.

		HESI-Mid score	HESI Exit Exam
HESI-Mid score	Pearson Correlation	1	.647*
	Sig. (2-tailed)		.023
	N		12
HESI Exit Exam	Pearson Correlation		
	Sig. (2-tailed)		
	N		

*. Correlation is significant at the 0.05 level (2-tailed).

Ultimately, all of the students in the fall 2013 cohort (the complete sample, not only the 12 reported on here) passed the NCLEX.

Low HESI Scoring Student

One of the students in the class scored 772 (about 2 standard deviations below the mean) on the mid-curricular HESI. This student's pattern of usage in PassPoint is shown below (Table 5). The student's score on the HESI exit exam was 952 which represented a positive change of 180 points (the largest difference between the mid-curricular and the exit HESI exam in this student group).

Number of Log Ins	46
Number of Quizzes	124
Number of Questions	1734
Mastery Level	4.50
Remediation Views	6
Number of Practice Exams	15
Number of Practice Exam Questions	1125
Exam ML	7.86

This student had the highest quizzing ML, and took the most practice exams (15) of the group.

Student Survey Analysis

Survey 2 data were available for 11 students.

Frequency of Use: One of the student survey questions asked students to report on how often they used prepU.

Usage	Frequency
2-3 times per week	3
Weekly	7
Daily	1
Total	11

Use of PassPoint: Another question asked students in what ways features of PassPoint were helpful.

Table 7: Helpful Features of PassPoint

Did you use PassPoint to help with any of the following?	Number of Students
Preparing for exams	9
Measuring and monitoring course progress	5
Getting feedback on my strengths and weaknesses	8
Increasing knowledge of course concepts	9

9/11 students (81.8%) reported that PassPoint was useful in helping prepare for exams and increasing knowledge of course concepts.

Importance of Features: Students were asked to indicate the level of importance of a list of PassPoint features. Most students reported that the large number of questions available was an important feature of PassPoint (see Table 8).

Table 8: Importance of Features

How important were the following features of PassPoint?	Extremely	Somewhat	Not Important
Mastery levels	8	3	
The large number of questions available for practice	10	1	
The system is adaptive and gives you questions just right for you	9	2	
Tracking progress throughout the quarter	7	4	
Easy-to-use interface	9	2	
Close connection to the content of the textbook	8	3	
Convenience of a web-based tool	7	4	

Impact of PassPoint Usage on course performance: 9/11 students indicated they felt PassPoint helped improve their course performance. The two students who did not feel PassPoint has an impact on their course performance indicated they did not use it enough to see a benefit.

Conclusions and Future PassPoint Usage

All students in the study group made use of PassPoint, although they used the practice quizzing feature more than the practice exams. The minimum number of quizzing questions was 1,292 and quizzes 117. Students reported that the large number of questions within PassPoint was an important feature, as was the ML feature as well as the adaptive functionality.

All students passed the NCLEX on their first attempt and had an average quizzing ML of 4.00 and an average exam ML of 7.87. Exam ML is typically higher because of the way that the exam ML is calculated.

We often see a correlation between quizzing activity and mastery which indicates usage of PassPoint leads to demonstrated ability to correctly answer more difficult question—thus with increased usage, student mastery of the content improves. We did not see that same pattern with this group of students—likely because there was very little variance in overall ML. If all students are around the same ML and seem to stop there, it is harder to tease out possible differences which may be seen with a different implementation (one in which we see a wider spread of overall ML between students). We were also only looking at a sub-set of students in this study and so do not have a complete picture of the whole cohort.

Students from the study group reported to Dr. Loan that when they took the actual NCLEX, they felt it was easier than the practice questions they had been taking. Many of these students have been passing on their experiences using prepU (and how it helped them) to the current cohort of students who will graduate in Dec 2014. Dr. Loan will use PassPoint in the fall 2014 semester and we will continue to collect data for the efficacy project.