

Case Study

Practice Exams Help Students Succeed On NCLEX

Monica Buchanon

College America

Advanced Medical Surgical Nursing | Fall 2013 and Spring 2014

Dr. Julia Phelan, National Center for Research on Evaluation, Standards, and Student Testing, *University of California-Los Angeles*

SUMMARY OF FINDINGS

- Students who used PassPoint above a minimum level passed the NCLEX on their first try.
- Students who used PassPoint utilized the practice exam feature (one student took 35 practice exams).
- Students who passed the NCLEX on their first attempt had an average quiz ML of 3.78 and an exam ML of 7.43.
- Students report to prefer PassPoint, over standardized-testing programs (HESI, ATI)

College America Nursing Program

The College America nursing program is a 20-month accelerated ADN program. Previously students have taken ATI exams, but one of the issues is that they see all the same questions over and over. During the capstone course, students must do well in the clinical component and also

take an exit exam (ATI). If they don't pass the exit exam they have to take a remediation course. Most students who make it to the capstone course are usually well-prepared and pass the exit exam. The national mean (~92-95%) is the passing criteria for the ATI exit exam.

PassPoint Implementation

PassPoint was implemented in fall 2013 with two groups.

- Group 1 ($N = 12$): Students who had already graduated and were given access to help prepare for the NCLEX. Students were part of a class and received assignments within PassPoint. They were encouraged to practice taking longer exams in the practice exam section.
- Group 2 ($N = 12$): These were students who received access to PassPoint during their Advanced Med Surg course.



Students did not get any course credit for using PassPoint. It was expected that they use the resource to help prepare for the NCLEX as well as the exit exam.

PassPoint Usage: Group 1

Overall PassPoint usage is shown in Tables 1 and 2. All 12 students took quizzes in PassPoint. The average number of quizzes was 153 ($SD = 42.06$), the average number of questions was 1,062.75 ($SD = 953.53$), and the average ML was 3.18 ($SD = 1.18$). Three students answered over 2,000 quiz questions.

	N	Min	Max	M	SD
Number of Log Ins	12	7.00	129.00	47.33	43.81
# Quizzes	12	8.00	153.00	49.17	42.06
# Quiz Questions	12	160.00	2805.00	1062.75	953.53
ML	12	2.00	6.30	3.18	1.18
Remediation Views	12	.00	29.00	7.25	9.84

Students also had access to remediation links within PassPoint. The average number of links accessed was 7.25 with the maximum 29. Two students did not access the links at all and 75% of the group accessed 6 or fewer.

Table 2 shows student usage and ML within the practice exam area of PassPoint.

	N	Min	Max	M	SD
# Exams	10	2.00	35.00	13.30	11.27
# Exam Questions	10	150.00	3450.00	1439.00	1295.38
Exam ML	10	6.36	7.94	7.39	.51

Two students did not take any exams within PassPoint and so data are shown for those students who used this feature. The average number of exams was 13.30 and the average number of questions 1,439. Average exam ML was 7.39. Given the large standard deviation for the number of questions, the median was calculated. Median number of questions was 600.

Frequency distributions for number of exams and number of exam questions are shown in Figures 1 and 2 below (for Group 1).

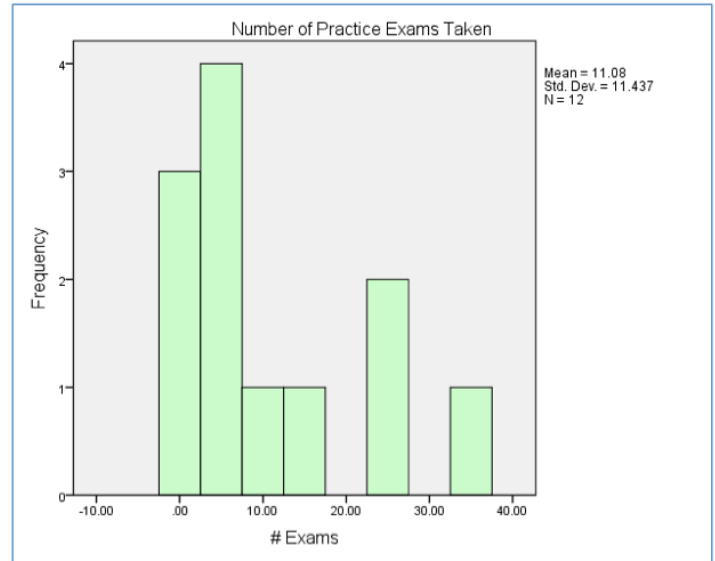
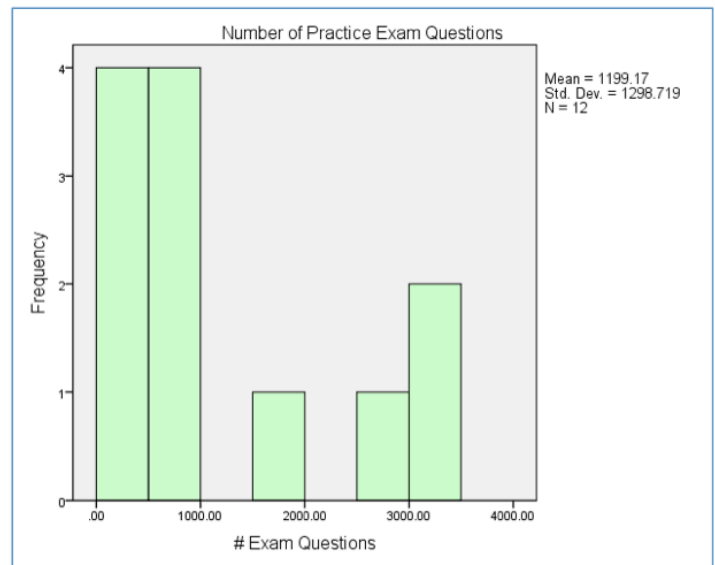


Figure 1: Number of Practice Exams



the average ML was 5.28 ($SD = 1.34$). Seven students answered over 2,000 quiz questions. Students also had access to remediation links within PassPoint. Six students did not access the links at all, three students used one, and one student used two links. The remaining two students accessed 25 links and 148 links.

	N	Min	Max	M	SD
Number of Log Ins	12	21.00	124.00	66.08	26.46
# Quizzes	12	61.00	442.00	145.92	105.37
# Quiz Questions	12	609.00	3575.00	1887.00	954.10
ML	12	3.00	7.10	5.28	1.34
Remediation Views	12	.00	148.00	14.83	42.53

Table 4 shows student usage and ML within the practice exam area of PassPoint.

	N	Min	Max	M	SD
# Exams	12	1.00	26.00	8.50	7.82
# Exam Questions	12	75.00	3450.00	1060.42	926.72
Exam ML	12	3.23	8.00	7.14	1.39

All students took at least one practice exam with a class average of 8.5 ($SD = 7.82$). The median number of exams was 7. The average number of exam questions was 1,060 ($SD = 926.72$) and the median number of questions was 902.5. Average exam ML was 7.14.

Frequency distributions for number of exams and number of exam questions are shown in Figures 3 and 4 below.

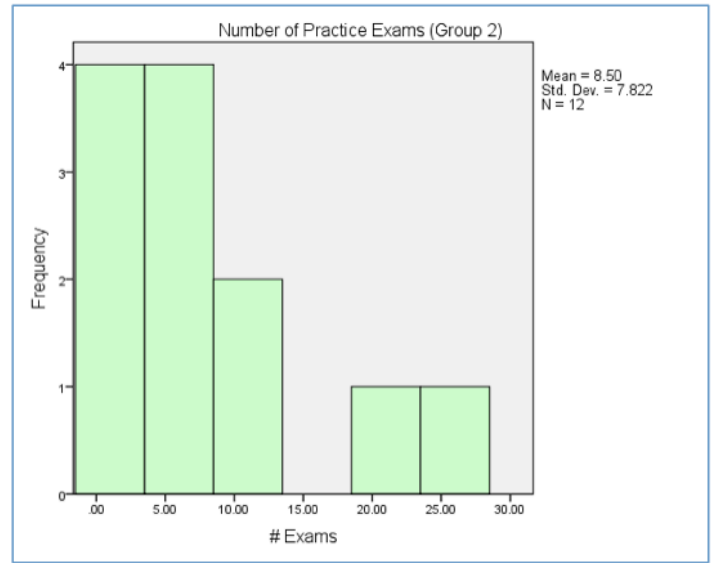


Figure 3: Number of Practice Exams (Group 2)

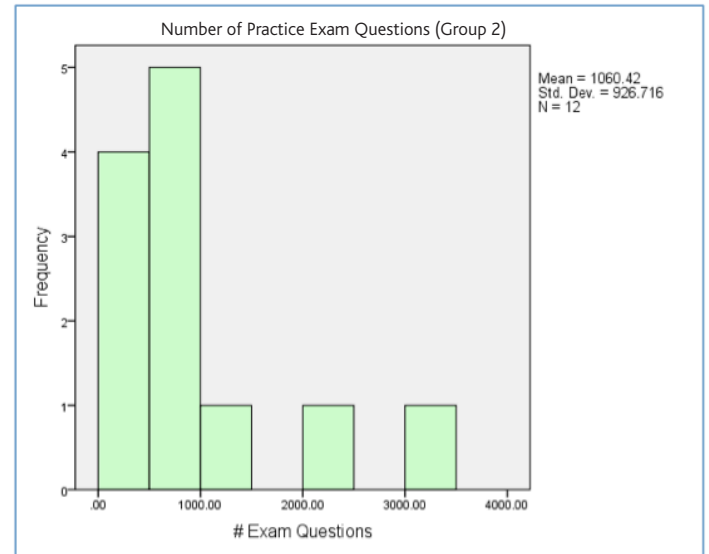


Figure 4: Number of Practice Exam Questions (Group 2)

NCLEX Pass Rates

Group 1: To date, 10 students in Group 1 passed the NCLEX on their first attempt. The other two students used PassPoint to some degree but, owing to personal circumstances (marriage and birth of a child), did not utilize the

resource as they should have and also did not sit for the exam until 3-6 months after graduation. Delaying taking the NCLEX after graduation is frequently associated with poor outcomes and is discouraged by most nursing faculty.

Group 2: This group of students graduated in spring 2014. At the time this was written (July 2014), 6 students have taken and passed the NCLEX, 1 student has not passed, and the rest have yet to take the exam.

PassPoint Usage for Students Passing the NCLEX

	N	Min	Max	M	SD
Number of Log Ins	16	7.00	124.00	53.75	38.23
# Quizzes	16	8.00	188.00	68.88	51.38
# Quiz Questions	16	160.00	2917.00	1330.25	1041.39
Quizzing ML	16	2.00	6.60	3.78	1.54
Remediation Views	16	.00	148.00	15.63	36.67

Combining Groups 1 and 2, there were 16 students who passed the NCLEX (66% of the group). But excluding those who have not yet taken the exam, the pass rate for Groups 1 and 2 was 76.2%. Students who passed the NCLEX had an average PassPoint quizzing ML of 3.78 ($SD = 1.54$) and answered a median of 858 questions and viewed a median of 2.5 remediation links.

PassPoint exam usage is shown in Table 6. Data shown is for those students passing the NCLEX who took at least one practice exam ($N = 15$).

	N	Min	Max	M	SD
# Exams	15	2.00	35.00	12.33	10.85
# Exam Questions	15	150.00	3450.00	1413.33	1243.86
Exam ML	15	5.60	8.00	7.43	.67

For students passing the NCLEX, the median number of practice exams was 8, the median number of exam questions 790, and the median exam ML 7.68.

PassPoint Practice Quizzing

Table 7 compares usage of PassPoint practice quizzes between those students who passed the NCLEX ($N = 16$) and those who did not ($N = 5$).

	Passed NCLEX	N	M	SD
Number of Log Ins	Yes	16	53.75	38.23
	No	5	76.40	32.85
# Quizzes	Yes	16	68.88	51.38
	No	5	188.00	151.45
# Quiz Questions	Yes	16	1330.25	1041.39
	No	5	2086.80	960.36
Quizzing ML	Yes	16	3.78	1.54
	No	5	5.92	1.11
Remediation Views	Yes	16	15.63	36.67
	No	5	3.00	5.10

An independent samples t-test revealed a significant difference on overall ML between those students who did not pass the NCLEX and those who did; Students who did not pass had a higher average ML ($M = 5.92, SD = 1.11$) than those who did pass ($M = 3.78, SD = 1.54$). Overall usage (log-ins, quizzes and questions answered) was higher for the non-passing group (although not significantly so), while access to remediation links was higher in the passing group ($M = 15.63$ vs. $M = 3.00$).

Practice Exam Usage

Data in Table 8 shows the comparison between passing and non-passing students in terms of PassPoint practice exam usage and exam-based mastery.

Table 8: PassPoint Practice Exam Usage and Mastery (all test takers)

	Passed NCLEX	N	M	SD
# Exams	Yes	16	11.56	10.92
	No	5	9.40	4.39
# Exam Questions	Yes	16	1325.00	1252.55
	No	5	1075.00	530.73
Exam ML	Yes	16	6.96	1.97
	No	5	6.55	1.89

The pattern of usage for practice exams was reversed between groups, with the passing students taking more practice exams and questions and ending up with a higher exam ML. None of these differences, however, were significantly different.

The overall trends suggest that students who passed the exam were taking more practice exams (although, as noted, the differences were not significant.) Moreover, those students who did not pass the NCLEX exam had more time pass between commencing use of PassPoint and taking the exam. Thus, we would expect their usage to be higher. As noted above, those students who passed the NCLEX accessed the remediation links more often as compared to those who did not.

Within PassPoint Correlations

We used a Pearson product moment correlation to explore the relationship between PassPoint usage and subsequent mastery level (which is a reflection of the average question difficulty students are answering correctly). The analysis revealed a significant, positive correlation between the number of questions and quizzes answered in PassPoint (quizzing) and overall ML (see Table 9). This indicates that as the students answer more questions within PassPoint, their mastery of the content improves as indicated by the average difficulty of the questions that they can answer correctly increases.

Table 9: Within PassPoint Quizzing Correlations (all students)

		# Quizzes	# Quiz Questions	Quizzing ML
# Quizzes	Pearson Correlation	1	.695**	.620**
	Sig. (2-tailed)		.000	.001
	N		24	24
# Quiz Questions	Pearson Correlation		1	.488*
	Sig. (2-tailed)			.016
	N			24
Quizzing ML	Pearson Correlation			1
	Sig. (2-tailed)			
	N			

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

Further analyses looked at all PassPoint usage and mastery data, again using a Pearson product moment correlation. Findings are shown below in Table 10.

Table 10: Within PassPoint Correlations (Quizzes and Exams)

		Quizzes	Quiz Questions	Quizzing ML	Exams	Exam Questions	Exam ML
Quizzes	Pearson Correlation	1	.695**	.620**	.061	.071	.287
	Sig. (2-tailed)		.000	.001	.779	.741	.173
	N		24	24	24	24	24
Quiz Questions	Pearson Correlation		1	.488*	.485*	.566**	.465*
	Sig. (2-tailed)			.016	.016	.004	.022
	N			24	24	24	24
Quizzing ML	Pearson Correlation			1	-.156	-.112	.215
	Sig. (2-tailed)				.466	.601	.313
	N				24	24	24
Exams	Pearson Correlation				1	.960**	.358
	Sig. (2-tailed)					.000	.086
	N					24	24
Exam Questions	Pearson Correlation					1	.359
	Sig. (2-tailed)						.085
	N						24
Exam ML	Pearson Correlation						1
	Sig. (2-tailed)						
	N						

** . Correlation is significant at the 0.01 level (2-tailed).
* . Correlation is significant at the 0.05 level (2-tailed).

The number of quiz questions answered by students was significantly positively correlated with number of practice exams, exam questions, and exam ML. So, usage in one area of PassPoint (practice quizzing) was positively associated with usage in the practice exam area—overall, students who answered more quiz questions answered more practice exam questions.

Group 1 and Group 2 Comparison

Usage and mastery data were compared between semester groups. The fall semester (Group 1) students were those

who received PassPoint access post-graduation, and the spring students (Group 2) used PassPoint in a more integrated way. PassPoint was used (for the latter group) as part of the course. Data indicate a higher degree of PassPoint quizzing usage in the spring than in the fall, which is not surprising given the difference in implementation (see Table 11).

Table 11: PassPoint Quizzing and Mastery (comparison of Groups 1 and 2)

	Semester	N	M	SD
Number of Log Ins	Fall 2013	12	47.33	43.81
	Spring 2014	12	66.08	26.46
# Quizzes	Fall 2013	12	49.17	42.06
	Spring 2014	12	145.92	105.37
# Quiz Questions	Fall 2013	12	1062.75	953.53
	Spring 2014	12	1887.00	954.10
Quizzing ML	Fall 2013	12	3.18	1.18
	Spring 2014	12	5.28	1.34
Remediation Views	Fall 2013	12	7.25	9.84
	Spring 2014	12	14.83	42.53

Feedback from Professor Buchanon

“This past year we have used PassPoint in various ways in the classroom and for out-of-class assignments. Bloom’s *Taxonomy* is playing an important part as is the NCLEX blue print. The students who are using PassPoint properly are making rapid progress. Hands down, they prefer the program over standardized testing, i.e., HESI or ATI.”

Conclusions and Future Use

The current cohort of students who will graduate in fall 2014 are using CoursePoint and PassPoint. Students have been positive that all 100% of the feedback has been good. This group of students will have had access to PassPoint for the longest time prior to graduation (in subsequent analyses, this group will be Group 3).

Students entering the program in July 2014 will also use CoursePoint and PassPoint. Instead of waiting for the Ad-

vanced Med Surg course, these students will begin to use PassPoint right away. Professor Buchanon sees a benefit to having students using CoursePoint (associated with a particular text) and as well as PassPoint to get practice on a variety of nursing topics. During the recent orientation for the incoming students, both PassPoint and ATI were presented to students and students all reported to like the adaptive program (PassPoint).

Students in Group 1 made use of PassPoint in the time after graduation and, ultimately, those who used the program at a meaningful level all passed the NCLEX on their first attempt. Professor Buchanon reported that the students who did not use PassPoint “correctly” were the students who ended up not passing the exam. One of the students used PassPoint but waited more than six months to take the NCLEX exam. The other student who did not pass the exam cited test anxiety as the reason she did not pass. A third student failed the NCLEX on the first attempt and then began to use PassPoint to study for the second attempt (which was successful).

Students in Group 2 had a higher level of usage overall as well as a higher final ML. For the PassPoint quizzing, the overall average ML was 5.28, and for the PassPoint practice exams 7.14. For the seven students who have so far taken the NCLEX and passed, the average quizzing ML was 5.03, and exam ML 7.5.

Positive correlations between quizzing activity and mastery indicated that usage of PassPoint leads to demonstrated ability to correctly answer more difficult questions—thus, with increased usage, student mastery of the content improved. With a new product where students can choose to take practice quizzes as well as longer-length practice exams, exploring the connection between usage and mastery becomes more complicated as usage is effectively spread across two different areas—each with somewhat different goals. The practice quizzes serve to provide a practice and

learning environment in which students take short, adaptive quizzes and answer questions on particular content areas (which they select). When students choose to take practice exams, they are engaging in a longer-length testing experience, which helps to build stamina and endurance (useful on the day of the exam) and also allows them exposure to content across all NCLEX-tested client needs. And so when we are exploring usage and mastery outcomes, we have two measures of usage to consider as well as two mastery outcomes. The positive correlation between number of quiz questions and number of exam questions does, however, suggest that students who have high usage in PassPoint practice quizzing also answer more practice exam questions.

Use of remediation links varied across students. In both groups there were some students who did not access the links at all, or who accessed them only once or twice. Half of the students in Group 2 did not access any remediation links. This pattern of usage is somewhat unexpected as the remediation links are a new feature which many instructors report is a very useful addition to PassPoint. Further exploration is needed to determine how and when students are accessing the remediation links and if there are any factors which are influencing their utilization of this resource.

In a discussion with Professor Buchanon on the issue of remediation link usage, it appears that there may have been some problems within the system which resulted in remediation link access not being recorded. We will investigate this possible explanation for the low level of remediation link usage.