COURSE SUCCESS

LIPPINCOTT FOR LIFE

Case Study

Students Embraced Adaptive Learning As A Studying And Learning Tool

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Foundations of Nursing Practice | Spring 2012

SUMMARY OF FINDINGS

- **Students were required to take five 50-question quizzes. Even when they had satisfied this requirement, students chose to study within prepU (median number of questions answered was 1472.5).**
- **Students clearly saw value in using prepU as a studying and learning tool.**
- **Usage of prepU leads to demonstrated ability to correctly answer more difficult questions; mastery of the content improves.**

Course

Foundations of Nursing practice is a course with both a lecture and clinical component. During spring 2012, 58 students enrolled in the course and used the *Fundamentals of Nursing (Taylor)* textbook along with prepU.

Course Grading Policies and Assessment

- Four exams (70%)
- Dimensional Analysis test (5%)
- Lab quizzes (5%)
- Foundation HESI as a final exam (20%)

Separate grade for the clinical part of the class:

- Care plan (80%)
- NCLEX Quizzes (10%)
- Journal (10%)

prepU Implementation

prepU was implemented during the spring semester in the following way:

a) Five 50-question quizzes in prepU with scores given based on the number of correct responses

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b) Students encouraged to study independently and create their own quizzes in PrepU for each chapter assigned for class reading

Results

Of the 58 students who enrolled in the course, 52 completed all course requirements and 6 dropped the course. Usage data from the 52 students who completed the course is shown in Table 1. Of the 52 students who completed the course, 100% of them took quizzes in prepU, with an average of 135.06 quizzes and 85,893 total questions answered. The requirements for the course were for students to take five 50-item quizzes (250 items) with scores contributing to the final grade. All students used prepU far above the minimum requirements. Students answered an average of 1,651.79 (*SD* = 765.81) questions and had an average ML of 4.11 (*SD* = 1.12). The median number of questions answered was1,472.5.

Table 1: prepU Usage and Mastery Data, Spring 2012

	N	Min	Max	M	SD
Log Ins	52	28.00	314.00	76.04	54.92
Number of Quizzes	52	52.00	430.00	135.06	79.37
Number of Questions	52	712.00	4872.00	1651.79	765.81
ML	52	2.80	7.40	4.11	1.12

Figure 1 (right) shows the frequency of number of questions across the cohort. Four students answered over 3000 questions, with the rest of the cohort answering between 712 and 2,389.

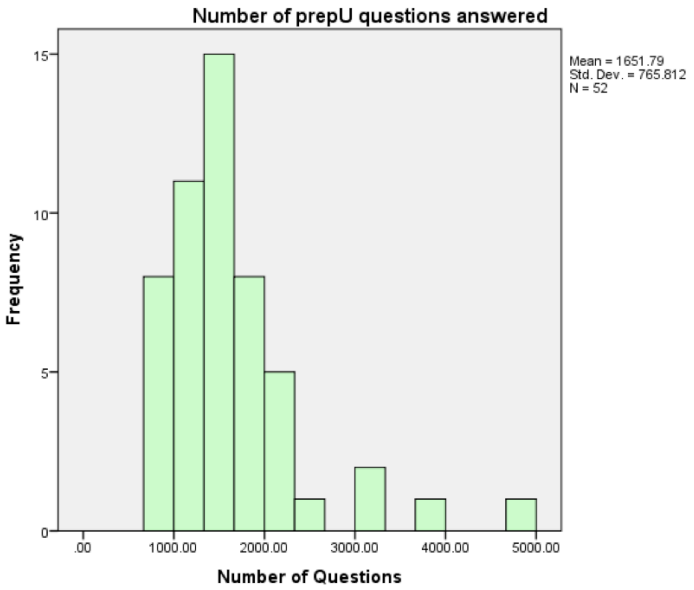

Figure 1: Overall number of prepU questions answered

As part of the course requirements, students answered 250 questions (as assigned quizzes). Table 2 below shows the average number of questions students answered above the minimum requirement of 250.

Table 2: prepU Usage and Mastery Data (above minimum requirement)

	N	Min	Max	M	SD
Number of Questions > 250	52	462.00	4622.00	1401.79	765.81

Course Outcomes

Course outcome data is presented in Table 3. These data include the total number of points earned (*M* = 82.38, *SD* = 4.34), scores on the three entry HESI exams, and other course exams. The entry level HESI is broken into several categories and the two required categories were reading and math. Of the original 58 students, 52 completed all requirements and achieved a final grade in the course. Data for the 52 students who completed all requirements were used in the subsequent analyses.

Table 3: Course Outcomes

	N	Min	Max	M	SD
EL HESI Math	52	74.00	100.00	89.54	6.49
EL HESI Science	52	60.00	96.00	82.85	8.13
EL HESI Reading	52	76.00	100.00	91.56	5.28
EL HESI Cumulative	50	63.00	96.00	86.14	6.49
Exam 1	52	66.00	96.00	85.23	6.71
Exam 2	52	72.00	94.00	81.54	5.17
Exam 3	52	62.00	92.00	84.23	5.76
Exam 4	52	50.00	98.00	78.77	8.19
DA Exam	52	75.00	100.00	91.96	9.81
HESI 1	52	57.00	100.00	78.92	10.51
HESI 2	52	61.00	97.00	79.88	8.02
Final Exam Grade	52	63.00	95.00	79.63	7.60
Final Grade	52	73.00	93.00	82.38	4.34

Course Outcomes and Mastery Level Groups

To investigate the relationship between ultimate prepU mastery level (ML) and other course outcomes, the class was divided into two ML groups, high and low. The division was made at the mean of 4.11 rounded to 4. The low ML group had a ML of 4 and below (N = 29) and the high ML group comprised all students with a ML of 4.1 and above (N = 19). To determine if these two groups were equivalent at the outset, scores on the entry level exams were investigated. Descriptive statistics for the entry level scores for these two groups are shown in Table 4.

Table 4: Group Statistics

	ML Group	N	M	SD	Std. Error Mean
EL HESI Math	Low ML	31	88.97	6.36	1.14
	High ML	21	90.38	6.74	1.47
EL HESI Science	Low ML	31	83.23	8.03	1.44
	High ML	21	82.29	8.44	1.84
EL HESI Reading	Low ML	31	91.39	5.46	.98
	High ML	21	91.81	5.12	1.12
EL HESI Cumulative	Low ML	30	85.90	6.38	1.16
	High ML	20	86.50	6.81	1.52

Results of an independent samples t-test revealed no significant differences between these two groups at the beginning of the course on any of the entry level HESI exams. Thus we can assume that the groups were equivalent at the start of the course.

Course outcome data were also compared between the high and low ML groups (see Table 5).

Table 5: Course outcomes by ML group

	ML Group	N	M	SD	Std. Error Mean
Exam 1	Low ML	31	85.61	6.92	1.24
	High ML	21	84.67	6.52	1.42
Exam 2	Low ML	31	81.87	5.29	.95
	High ML	21	81.05	5.08	1.11
Exam 3	Low ML	31	84.00	6.24	1.12
	High ML	21	84.57	5.10	1.11
Exam 4	Low ML	31	79.81	7.14	1.28
	High ML	21	77.24	9.50	2.07
DA Exam	Low ML	31	91.94	10.40	1.87
	High ML	21	92.00	9.13	1.99
HESI1	Low ML	31	78.74	10.45	1.88
	High ML	21	79.19	10.85	2.37
HESI2	Low ML	31	79.77	7.98	1.43
	High ML	21	80.05	8.28	1.81
Final Exam Grade	Low ML	31	79.45	8.18	1.47
	High ML	21	79.90	6.83	1.49
Final Course Grade	Low ML	31	82.55	4.41	.79
	High ML	21	82.14	4.34	.95

There were no significant differences between the high/low ML groups and course outcomes. One possible reason for the non-significant findings is that the range of scores was narrow, with a small standard deviation. As students are required to complete five 50-question assignments, the low end of the range (which we typically see) is eliminated. Thus there are more students within a narrower range of Mastery Levels.

Table 6 shows the number of prepU questions answered by each of the two ML groups. Results of an independent samples t-test indicated a significant difference between the number of questions answered by the low ML group (M = 1361.74.1, SD = 339.4) and the high ML group (M = 2079.9, SD = 629.60), t (50) = - 3.711, p < .01. Thus we see that as students answer more questions with prepU, their ML increases along with the difficulty level of the questions they answer correctly.

Table 6: Average number of questions by ML group

	ML Group	N	Mean	SD
Number of Questions	Low ML	31	1361.74	719.36
	High ML	21	2079.95	629.60

Within prepU Correlations

A Pearson product-moment correlation coefficient was computed to assess the relationship between the student usage variables within prepU. There was a positive correlation between ML and number of questions answered, r (52) = .601, p < .01, and also for total number of quizzes taken, r (52) = .690, p < .01 (see Table 7).

Table 7: Correlation between number of questions and ML

		Number of Questions	ML	Number of Quizzes
Number of Questions	Pearson Correlation	1	.601**	.899**
	Sig. (2-tailed)		.000	.000
	N		52	52
ML	Pearson Correlation		1	.690**
	Sig. (2-tailed)			.000
	N			52
Number of Quizzes	Pearson Correlation			1
	Sig. (2-tailed)			
	N			

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

A linear regression did not yield significant findings with this cohort of students.

Conclusion

prepU was used in Foundations of Nursing Practice both as an independent study tool for students and also as an integrated part of the course. Usage for all students far exceeded the minimum course requirements and for the students who completed the course, the average number of prepU questions answered was 1,472.5. To further investigate the impact of prepU ML on course outcomes, students were divided into two ML groups (high and low). Entry level data indicated no significant differences between these groups at the start of the course, thus the two groups can be seen as equivalent at the outset with any differences at the end of the course attributable to some feature of the course. The average ML was 4.11 (SD = 1.1) and students with a higher prepU ML answered significantly more questions than those with a lower ML.