

## Case Study

# Higher Mastery Predicting Course Outcomes

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### SUMMARY OF FINDINGS

- prepU mastery level was significantly, positively correlated with the number of questions answered in prepU.
- the number of questions answered in prepU could be used, in this course, to predict the final exam score.

### Course

Nursing 327 (Adult Nursing) is a course for junior nursing students. During fall 2011, 20 students were enrolled in the course and used the Smeltzer textbook along with prepU.

### Course Grading Policies and Assessment

Course grades were made up of:

- Five mid-course exams and one final
- Pre-lecture quizzes

### prepU Implementation

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

- a) 5% of the overall grade was awarded for completion of pre-lecture mastery level quizzes if students attained a mastery level of 3 or 4. Specific question collection quizzes were also assigned occasionally. These quizzes were based on single topics (e.g., blood and blood products).
- b) In addition, students were encouraged to study independently and create their own quizzes in prepU for each chapter assigned for class reading.



## How prepU is Used in the Course: Instructor Comments

- "My favorite feature of prepU is the misconception feature. I use it to identify these misconceptions and assist students to 'unlearn' certain concepts and/or enhance my lecture portion of that concept."
- "My students state they really like the ability to practice until they meet the highest mastery level they want. They have told me they like how it is tied to the text book and each chapter. They LOVE that it is adaptive compared to ATI assessment tests."
- "I use the quizzing/assignment set up the most. From that I am able to determine the misconceptions which are what I really use the most of."
- "I use the data in two ways. The misconceptions are used to help guide lecture and to correct any misconceptions. I also use it to assist students who may be struggling with ideas of how to better study or 'tackle' their prep before and after class."

## Student Usage

Number of Students	20
Students who've taken a quiz:	20 (100%)
Quizzes taken:	14,505
Average number of quizzes: (among those who've taken quizzes)	725.3
Questions answered:	108,062
Average number of questions: (among those who've taken quizzes)	5,403

The average number of questions answered by each student in this course was 5,403. This number is much larger than many other courses from which we have captured data during the fall semester. And in looking at all students using the Smeltzer book we see that for the 3,801 students who took a quiz in prepU the average number of questions per student was 558 (see Table 2).

	All Students	Nursing 327
Number of students who have taken a quiz	3,810	20
Average number of logins	18	130.4
Average number of quizzes (per student)	51	725.3
Total number of questions answered:	2,125,438	108,062
Average number of questions per student	558	5,403

Of the 20 students who began the course, 17 completed all course requirements. prepU usage for these 17 students in the course is further broken down in Table 3. The average mastery level was 7.52 (ranging from 2-8) and the average number of questions answered per students was 5815.06.

	N	Min	Max	M	SD
Overall Logins	17	52	299	142.53	62.2
Overall number of quizzes	17	438	1414	776.82	289.95
Overall number of questions	17	3343	10130	5815.06	2269.85
Final Mastery Level	17	7	8	7.52	.52

## Course Grades

Scores for unit exams 2-5, the pre-lecture quizzes and the final exam are shown in Table 4 below. The data for unit exam 1 is not included in the analysis as all students achieved the maximum 100 points on this exam. **Within**

	N	Min	Max	M	SD
Unit 2 Exam	17	73	89	80.71	4.43
Unit 3 Exam	17	64	93	81.29	6.48
Unit 4 Exam	17	75	90	81.53	4.73
Unit 5 Exam	17	68	90	81.88	5.04
Final Exam Score	17	80	95	86.12	4.64
Pre-lecture quiz score	17	150	230	224.12	19.38

## prepU Correlations

An analysis of the average number of questions answered by students and their prepU mastery level revealed a significant, positive correlation between number of questions and final mastery level,  $r(17) = .47, p < .05$ .

## Conclusions

Professor Orm has been using prepU as part of her course requirements for just over a year. In her first semester using it (Fall 2010) she found that having prepU as part of her course increased student preparation for this course, and she was confident that the number of quizzes taken before the exam will correlate with the exam results. Professor

Orm also reported that prepU usage of her students was “way beyond her expectations!” The current semester usage by the Nursing 327 students is far above the average of all students using the Smeltzer textbook (as reported above) and the average on all of the course outcomes was above 80%. By incorporating prepU into the course curriculum with pre-lecture, mastery-level quizzes for each of 23 lectures, students were encouraged to begin using the system and clearly kept using it throughout the course—with excellent results.