

## Mastering A&P educator study reviews pilot results for A&P II for Lipscomb University

<p><b>School Name</b> Lipscomb University</p> <p><b>Course name</b> Anatomy and Physiology II</p> <p><b>Course format</b> Face to face</p> <p><b>Course materials</b> Mastering A&amp;P for Fundamentals of Anatomy and Physiology by Martini</p>	<p><b>Timeframe</b> Spring 2017</p> <p><b>Submitted by</b> Jill Kirby, Lecturer</p> <p><b>Results reported by</b> Betsy Nixon, Customer Outcomes Analytics Manager</p>
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### Key Findings

- Students who scored above the mean Mastering score had significantly higher quiz, unit exam, and final exam averages than students who earned below the mean.
- Students who attempted all Mastering homework had significantly higher quiz, unit exam, and final exam averages than students who skipped one or more Mastering assignments.
- 72 percent or more of students who responded to an end-of-semester survey agreed or strongly agreed with a series of questions about how helpful Mastering was to them in the course

## Setting

- Founded: 1891
- Enrollment: 3,526 full time
- Type: Private liberal arts institution
- Programs: Liberal arts and sciences, undergraduate professional and pre-professional fields, and master's and doctoral degree programs
- Mission: Integrate Christian faith and practice with academic excellence
- Ethnic minority students: 1,031 (22 percent)
- Increase in minority enrollment since 2005: 346 percent

## About the Course

Jill Kirby, adjunct lecturer, has a professional background as a physical therapist. In May 2016, she was hired as an adjunct lecturer at Lipscomb University to teach A&P I and II. This was her first time teaching in an academic setting.

Anatomy and Physiology II (A&P II) is the second course in a two-semester sequence that covers the basic structure and function of the human body using a systems approach. It is a four-credit lecture and lab and is a continuation of A&P I. It covers the circulatory, respiratory, digestive, excretory, endocrine, and reproductive systems with emphasis on homeostasis. Major topics of physiology are integrated with a systematic approach. The second A&P course is primarily taken by future nursing students who must complete both A&P I and II with a B or higher as prerequisites for admission to the nursing program.

Course objectives include, draw, label, and discuss the circulation of blood from the left ventricle, perfusion of the tissues, through the lungs, and back into the left ventricle; explain the typical immune response; Discuss common diseases/disorders and how they affect the human body; recognize the major vessels of the circulatory system; and list examples of how the individual systems interact with one another.

## Challenges and Goals

Prior to Kirby taking over the A&P courses, there was concern that students were earning As in the course but were not fully developing or retaining the skills and knowledge needed for future courses in nursing or other health-related programs. A goal was set to shift to a more rigorous curriculum so students would understand that they were entering into a science program. When Kirby took over the A&P courses, she reviewed past syllabi to better understand how the course had been taught and found that online resource use had been limited. She decided to explore adding interactive digital content to her course to help students remediate and learn more effectively on their own.

In Fall 2016, she class tested Mastering A&P® in one section of A&P I. She said, “As a new professor, I was trying to find what works and what doesn’t work with my students. I was just coming off of teaching a summer course where I expected the students to study the material with a few homework assignments mixed in, and they begged me for more homework.” Her goal with the Mastering class test was to become more familiar with the digital content and understand what resources were available, gather student feedback, and evaluate course results prior to making it a required component for all sections and courses. The results from the Fall 2016 A&P I pilot can be found [here](#).

Kirby decided to pilot Mastering in A&P II in Spring 2017 after completing the A&P I class test. She received positive feedback from students in A&P I, and the class test helped her better understand how Mastering could help facilitate student learning and achievement of her course goals. She summed up her initial experience by saying, “I got better on my end with assignments in A&P I as the semester went on. I tried to focus the homework on just the information I really wanted the students to focus on. I was new at using Mastering too, so I feel like I had a learning curve (and still do) as far as all the resources available.” While Kirby had used Mastering for one semester, she wanted to class test it for the second A&P course and collect additional data and feedback before making it a required component for all sections and courses.

## Implementation

For Spring 2017, Kirby taught two sections of A&P II, but piloted Mastering A&P in one section. Her course components in the pilot section included:

**Exams:** Three paper-and-pencil exams and a comprehensive final. The first test was primarily a review of background knowledge and skills. The second and remaining tests were new concepts.

**Quizzes:** Quizzes were administered via paper and pencil in class. She told students she may give pop quizzes which were the only opportunity to earn extra points.

**Mastering:** The assignments generally were assigned by chapter and consisted of a combination of multiple choice, true/false, activities, labeling, and video tutorials. They were required weekly except for weeks in which a test or major campus activity was scheduled. They were not timed. Students had multiple attempts, and the Mastering default settings were in place. The Mastering assignments also incorporated some case study questions.

The format for Mastering homework was very similar to how Kirby implemented it in the A&P I class test. However, she said, “I did take what I learned from Fall and worked to make the Spring homework much more focused. I would try to make sure I included labeling or questions that were from the area of each chapter that I felt was most important. I considered the information I knew I would test or quiz on and thought about how I could drive understanding with the homework. I still

started with the pre-built homework assignments, but I modified them more this semester.” On the end-of-semester A&P II survey, one student said, “[Mastering] helped me focus on the ideas that were most important to the chapter,” reinforcing that students benefitted from that strategy.

**Paper/tracings:** The students had to write a paper drawing on their knowledge from A&P and using an article as a reference point. In addition, students did blood tracings, which were designed to force students to look at the flow of blood through the body and map it out. The purpose of these assignments was to help students understand how to apply the concepts learned and to think critically about the topics.

## Assessments

- 30% Exams (3)
- 25% Lab
- 15% Final exam
- 10% Quizzes
- 10% Mastering A&P homework
- 7% Paper
- 3% Tracings

## Results and Data

For Spring 2017, Kirby had two sections of A&P II and piloted Mastering A&P in one section. Students who had taken A&P I in Fall 2016 in the pilot section still had access to the Mastering study area. There was no information on which students in the non-Mastering A&P section of A&P II had access and used it during that semester, so the results of the A&P II pilot section were not compared to the non-Mastering section. Instead, the study focused on the performance of students in the section using Mastering utilizing the same type of analysis as was done in A&P I. Figures 1 and 2 show results based on grouping students according to Mastering participation and performance.

Students were first grouped according to the mean Mastering A&P homework score of 81 percent. Those who earned a Mastering average higher than the mean had significantly higher quiz, unit exam, and final exam averages than students who earned below the mean Mastering score. These results mirror the results found for the A&P I pilot (figure 1).

Students who did better on Mastering homework had a final exam average of 91 percent and unit exam average of 84 percent. These items total 45 percent of a student’s grade in a course in which they need to earn a B to move into the nursing program. Those who averaged lower on Mastering homework had a final exam and unit exam average of 77 and 70 percent respectively, putting them at a higher risk of not achieving the needed grade for the course.

### A&P II score averages based on mean Mastering A&P homework scores, Spring 2017

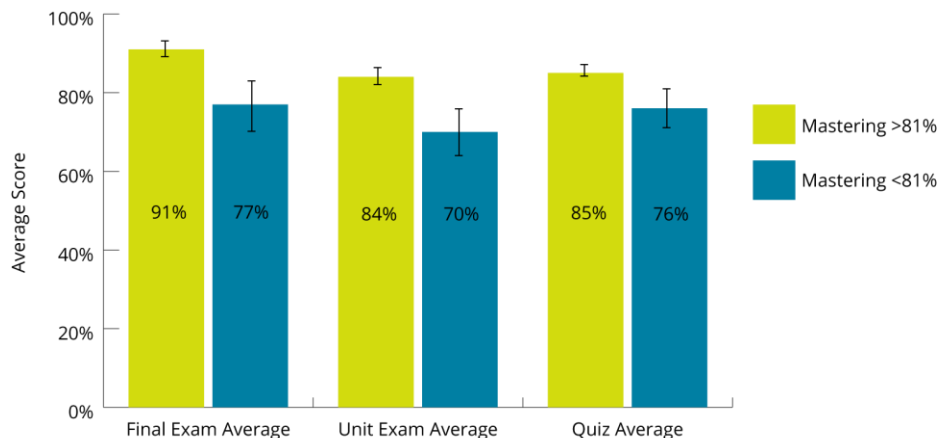


Figure 1. Mastering >81% (n=21); Mastering<81%, (n=9)

Students were next grouped based on the number of Mastering assignments attempted. The students who attempted all Mastering assignments had a significantly higher average for quizzes, unit exam, and final exam (figure 2) than students who skipped one or more Mastering assignments. For the A&P I pilot, only the final exam differences were statistically significant. Seven of 30 students (23 percent) skipped one or more assignments out of seven, with four skipping just one. The majority of students attempted all of the homework which seems to indicate the feedback Kirby initially received is accurate, and students do want homework in the course.

### A&P II score averages based on Mastering A&P homework participation, Spring 2017

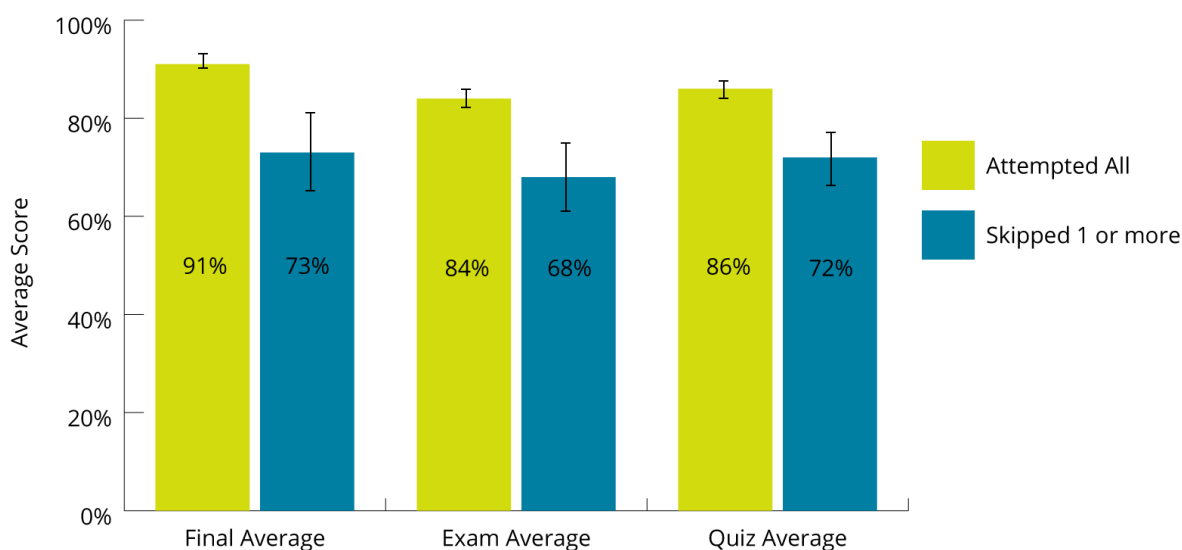


Figure 2. Attempted All (n=23); Skipped 1 or More (n=7)

Finally, a correlation analysis was conducted. Correlations do not imply causation but instead measure the strength of a relationship between two variables, where  $r$  is the correlation coefficient.

The closer the  $r$  value is to 1.0, the stronger the correlation. Table 1 shows a moderate correlation for the Mastering A&P homework average to the final exam, and a strong correlation to the quiz and unit exam averages. Homework is designed as a formative exercise to help students learn rather than a summative assignment to test knowledge, so that can impact the strength of the correlation.

### Correlation Analysis

	$r$ value
Quiz Average to Mastering Homework Average	.60
Unit Exam Average to Mastering Homework Average	.56
Exam Average to Mastering Homework Average	.60

Table 1,  $r$  value

## The Student Experience

An end-of-semester survey was conducted, and 29 out of 30 enrolled students (97 percent) completed the survey. Some of the students in this course did use Mastering in A&P I. Responses for A&P II were similar to those from the A&P I pilot, with the majority of students giving positive feedback.

A series of questions was asked about Mastering. Students could select an answer from strongly agree, agree, disagree, and strongly disagree. Table 2 shows the percent of respondents who answered strongly agree or agree, with the majority indicating that Mastering helped with their learning and performance in the course.

Table 2, Percent of students responding with strongly agree or agree to each question, Spring 2017 student survey (n=29)

Students were also asked "How did using Mastering impact your learning in the course?" Some of the responses included:

- *"It helped me learn the charts and labeling better than just listening in class and reading the book."*
- *"When it came around to taking quizzes and tests, I used Mastering as a tool to review the material I was being tested on."*
- *"The study area is my favorite area, doing the optional multiple choice, pre-test and test sections for each chapter. Matching and labeling were pretty helpful as well."*
- *A final question was, "What have been the challenges (if any) in using Mastering?" One student responded, "None this semester, I hope I get to keep access for a couple of years or semesters at least."*

## Conclusion

Kirby added digital content to the A&P I and II courses to provide resources that students could use to practice and learn on their own, and to provide graded homework with automatic feedback without the time constraint needed to develop and hand-grade paper-and-pencil assignments. Mastering was initially piloted in A&P I, and then piloted in A&P II. Results showed that students who attempted all of the Mastering homework or who earned higher than the mean average Mastering score had significantly higher quiz, unit exam, and final exam averages than students who skipped one or more assignments or averaged below the mean. In addition, student comments continued to reinforce that they found Mastering, particularly the study area, beneficial.

While Kirby acknowledges there was a learning curve with adopting Mastering, she feels that during her A&P I pilot semester she learned some best practices, including selecting assignments and items that reflect the primary concepts being emphasized and tested on in the course. She plans to require Mastering in all A&P I and II sections moving forward and to continue to evaluate her results and adjust her implementation to enhance learning. For the immediate future, she wants to implement the Adaptive Learning features to help students when they are struggling with certain concepts. With that diagnostic information, she can then assess student progress and better address areas where students are weak, utilizing class time to focus on those concepts.

**To read this study online, visit:** <http://www.pearsoned.com/results/mastering-ap-educator-study-reviews-pilot-results-ap-ii-lipscomb-university/>