

## Mastering A&P educator study reports on class test results for A&P I from Lipscomb University

<p><b>School Name</b> Lipscomb University</p> <p><b>Course name</b> Anatomy and Physiology I</p> <p><b>Course format</b> Face to face</p> <p><b>Course materials</b> Mastering A&amp;P for <i>Fundamentals of Anatomy and Physiology</i> by Martini</p>	<p><b>Timeframe</b> Fall 2016</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, exam, and final exam averages than students who earned below the mean.
- Students who attempted all Mastering homework had higher quiz and exam averages and a significantly higher final exam average than students who skipped one or more Mastering assignments.
- End-of-semester survey results showed that most respondents had not used Mastering in the past, but 81 percent were able to successfully register and log on the first time.
- 75 percent or higher of survey respondents 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 to teach A&P I and II. This was her first time teaching in an academic setting.

Anatomy and Physiology I is the first course in a two-semester sequence that covers the basic structure and function of the human body using a systems approach. The four-credit course comprises both lecture and lab. Major topics covered include organization levels and integumentary, skeletal, muscular, nervous systems. The laboratory work includes prosection examination, models, and experimental demonstration of concepts covered in class.

The course is designed primarily for students majoring in nursing or allied health fields. Both A&P I and II are required to be completed with a B or higher as prerequisites for admission to nursing. Some health programs require only A&P I, so the enrollment for the first course tends to be higher.

Course learning objectives for A&P I include to draw, label, and list the functions of the plasma membrane and the organelles of a typical human cell; identify the bones of the axial and appendicular skeleton; discuss skeletal muscle structure, as well as sequence of activation and contraction; recognize the major sensory and motor pathways of the Nervous System; and list examples of how the integumentary, skeletal, muscular and nervous 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. Kirby wanted to shift to a more rigorous curriculum so students would understand that they were entering into a science program. When she 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 that “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.

## Implementation

In designing the course, Kirby said she tried to find a balance between telling students everything in the book, since she expects them to read it, and pulling out big ideas to discuss, gauge understanding, and facilitate a deeper level of thinking. Kirby tells students that the study of Anatomy and Physiology requires a lot of effort on their part. She expects them to have read assigned chapters before coming to class so that they are prepared for lecture. In an end-of-semester survey, one student commented, “I liked to complete the homework before we started the material in class so I could connect more during lecture,” reinforcing the reason for Kirby’s focus.

The course components for the pilot section included the following:

**Exams:** Three exams and a final administered via paper and pencil. Exams covered four or five chapters of information, and the final was comprehensive.

**Quizzes:** Five paper-and-pencil quizzes administered during class. They covered one or two chapters, and questions were multiple choice. Kirby told students she may also administer pop quizzes which were the only opportunity to earn extra points.

**Mastering homework:** Fifteen Mastering homework assignments. Kirby usually started with one of the Mastering pre-built assignments and modified it based on what she believed would work best with her class. Mastering assignments were generally assigned by chapter and consisted of a combination of multiple choice, true/false, activities, labeling, and video tutorials. The assignments were due weekly except for weeks in which a test or major campus activity was scheduled. Homework was not timed. Students had multiple attempts, and Mastering default settings were in place.

**Case studies:** Pre-written case studies were assigned from the Pearson instructor resources. The case studies covered topics that Kirby felt students would benefit from thinking about more in depth and provided an opportunity to apply conceptual knowledge to real-world situations.

**Lab:** The class had a separate lab with a different instructor. Students had two lab practical exams which mostly involved labeling structures of the skeletal, muscular, and nervous systems. Lab quizzes/participation were graded based on attendance and involvement in lab.

## Assessments

- 30% Tests (three)
- 25% Lab
- 15% Final
- 13% Quizzes
- 10% Mastering A&P homework
- 7% Case studies

## Results and Data

Kirby piloted Mastering A&P in one section of A&P I in Fall 2016. She taught a second A&P I section that did not use Mastering and had no similar homework, but had the case studies and the same quizzes and tests. There was no data to compare the level of students in each section such as GPA or ACT/SAT scores. Quiz and exam scores were compared between the section with Mastering and the section without Mastering, and the results show that students performed comparably in the two sections. A further analysis for students in the pilot section using Mastering was then completed evaluating performance and participation on Mastering homework compared to assessments to try to gauge the impact on students who used Mastering.

First, students were grouped based on the mean Mastering homework score of 86 percent. All students averaged above or below with no student earning an 86 percent average. Figure 1 shows that students who averaged higher than 86 percent on the Mastering homework had significantly ( $p < .05$ ) higher quiz, unit exam, and final exam averages than students who averaged below the mean. The difference in averages for the exams and the final showed that students who scored higher on homework earned averages in the 80s versus those who scored lower on homework and earned assessment averages in the 70s. Since students must complete both A&P I and II with a B for the nursing program, and exams in this course were worth 45 percent of the course grade, students who achieved the higher averages would have a better chance of successfully completing A&P I with a B and moving on to A&P II, an outcome necessary for those wanting to advance to the nursing program.

### A&P I score averages based on mean Mastering A&P homework scores, Fall 2016

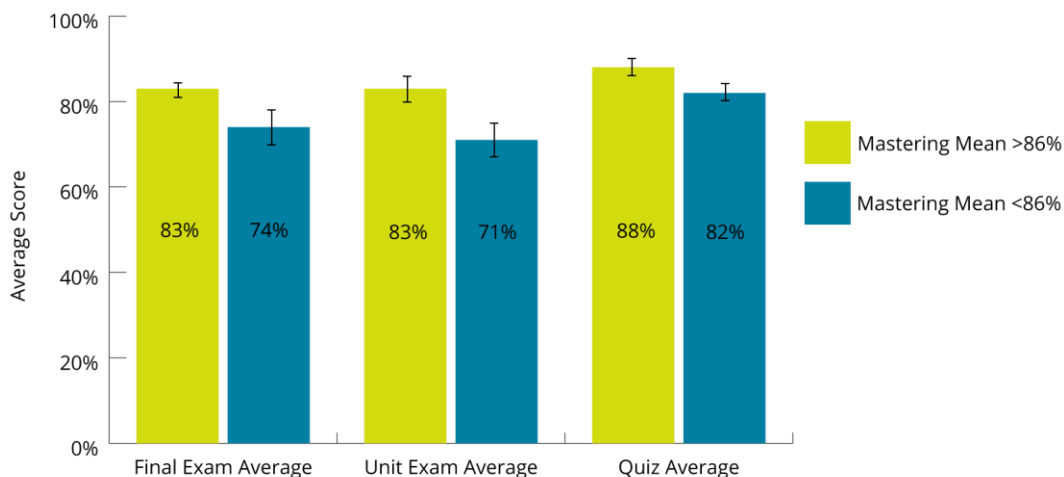


Figure 1. MA&P Mean > 86% (n=21); MA&P Mean < 86% (n=13)

The next analysis grouped students according to the number of Mastering assignments skipped (figure 2). Only eight out of 34 students skipped an assignment, and the average assignments skipped was .4 out of nine assignments (4 percent). Of the eight that skipped one or more assignments, five skipped only one, so overall Mastering homework participation was high. Results show that students who attempted all of the homework performed better on the quizzes, the unit exam average, and the comprehensive final. The difference in the final exam averages was the only statistically significant difference ( $p < .05$ ), but the low number of students that skipped an assignment may impact the analysis.

### A&P I score averages based on Mastering A&P homework participation, Fall 2016

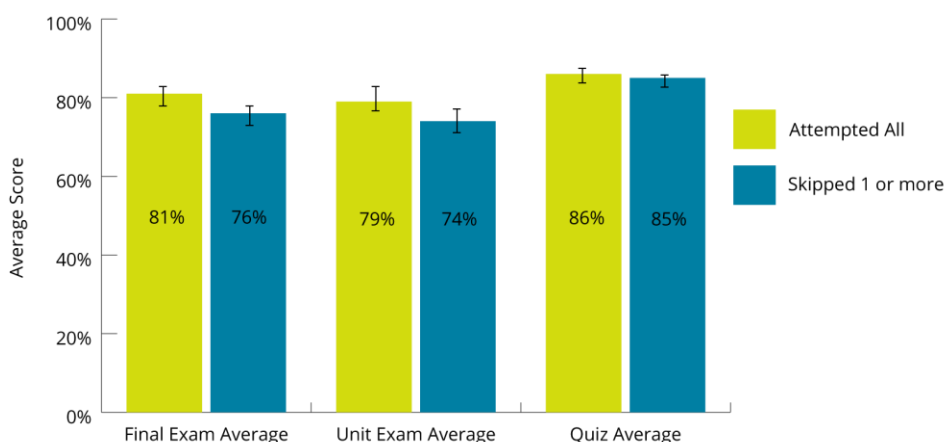


Figure 2. Average Scores A&P I Fall 2016; Attempted All (n=26); Skipped 1 or More (n=8)

Performance in the pilot section showed that students who had higher Mastering averages and attempted more assignments tended to have higher quiz, unit exam, and final exam averages. While students in the pilot section performed comparably on assessments to students in the section

without Mastering, further analysis would need to be done to better understand the results. In addition, there may be other factors that impacted the results that are difficult to measure such as background, study skills, or motivation. One note to the analysis is that one student was not able to take the final due to medical reasons. That student was not included in the average calculation for the final exam, but his scores are included in all other averages.

After reviewing the data for the pilot semester, Kirby said, “I definitely think there are some ways that I can adjust assignments to help students. I got better on my end with assignments as the semester went on. I tried to focus the homework more as it related to the information I really wanted the students to focus on. The results are definitely helpful to see. 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.” After learning more about Mastering in the A&P I class test, Kirby made a decision to pilot Mastering in A&P II in Spring 2017 and analyze those results. That study can be found [here](#).

## The Student Experience

One of Kirby’s goals for the class test was to gather student feedback. A survey was conducted with 32 of 34 enrolled students responding (94 percent). Sixty-four percent of respondents said they had not used Mastering in the past, but 81 percent were able to successfully register and log on to Mastering on their first try (13 percent said they were not able to; six percent did not remember).

A series of questions was asked about how helpful Mastering was in the course. Students could select an answer from the choices of strongly agree, agree, disagree, or strongly disagree. Table 1 shows the percent of respondents who answered strongly agree or agree for each question.

<b>Mastering homework is an important part of the learning process that helped me do well in the course.</b>	<b>Mastering provided additional resources that helped me learn more than I could with paper and pencil homework.</b>	<b>My understanding of the course material increased as a result of using Mastering.</b>
79%	78%	75%

Table 1. Percent of students responding with strongly agree or agree to each question. Fall 2016 student survey (n=32)

Students were also asked the following question, “How did using Mastering impact your learning in the course?” Some of the responses included:

- *“I loved the Study Area of Mastering as it allowed me to take extra quizzes and do activities that were super similar to our tests and quizzes.”*
- *“Additional Mastering resources (Study A and P section) helped broaden my knowledge of the material. I was able to quiz my knowledge from the practice quizzes and tests.”*

- *"I really liked it! The quizzes helped a lot and the homework was easy and reinforced what was taught in class."*
- *"If I didn't understand something in class, I found the videos on the homework helpful. The chapter homework, quizzes, and tests were tools I used to prepare for tests and quizzes."*
- *"[Mastering] forced me to look at material before I would have otherwise."*
- *"I'm a very visual learner, so it really helped me by providing diagrams and practice tests."*

While some students had challenges with Mastering, the overall results showed that the student experience was positive and reinforced to Kirby that Mastering would be a tool that could enhance learning for her students.

## Conclusion

Kirby class tested Mastering A&P in one section of A&P I to become more familiar with the resources, gather student feedback, and evaluate results. After completing the semester, she said, "I learned that utilizing Mastering was an easy way for me as an instructor to assign homework which could hopefully help increase a students' understanding and boost their grade without adding extra time for me in the grading process. As with any program like this, my students' reviews were mixed. Some of them loved the homework and felt that it helped guide them in their studying. Others thought it was just busy work, but most all of the students loved having access to the independent study area and resources."

A goal for any instructor is to get students engaged in the content, and feedback from students, particularly about the study area, support that the students were more engaged with the additional Mastering resources beyond just the graded homework.

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