

## MasteringA&P

School Name [Mercy College, Dobbs Ferry, NY](#)  
Course Name [Anatomy & Physiology I](#)  
Course Format [Face-to-face](#)

**Key Results** Data from the Getting Ready for A&P diagnostic questions in MasteringA&P helped administrators better understand student performance and begin to develop solutions to address the retention issues in the introductory A&P course.

**Submitted by**  
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**Course materials**  
MasteringA&P, *Human Anatomy & Physiology*, Elaine N. Marieb and Katja Hoehn; and *Human Anatomy & Physiology Laboratory Manual*, Elaine N. Marieb and Lori A. Smith

### Setting

Mercy College is a four-year private institution serving more than 11,000 full- and part-time graduate and undergraduate students. Of the total student population, 27 percent are male and 73 percent are female.<sup>1</sup>

Ferdinand Esser, assistant professor, taught Anatomy and Physiology at Mercy College as an adjunct professor for five years, and as a lecturer for the past three years. He also handles administrative duties as the A&P course coordinator and head instructor for course assessment.

Anatomy & Physiology I (A&P I) is a three-credit face-to-face course that introduces students to the structures of the human body and the functions of various organ systems. Successful students gain a working knowledge of chemistry, animal cells and tissues, and the structure and function of the integumentary, skeletal, muscular, and nervous systems. The integration of the body systems and how they influence one another, as well as the effects of disease on human physiology, are also considered during the course.

A&P I students are required to take a separate, concurrent one-credit lab that covers observations, demonstrations, dissections, and experiments and is designed to provide students with a working knowledge of anatomy and physiology. The course has math and English prerequisites.

A&P I lecture and lab students major primarily in physical therapy, occupational therapy, physician's assistant, and some nursing and dentistry. As of fall 2015, students must complete A&P I with a B- or higher in order to receive credit in their programs. During the following study, students were required to earn a C+ or higher to receive program credit.

Competencies addressed in the course include:

- Reading and writing
- Critical thinking
- Information literacy
- Quantitative reasoning
- Oral communication

### Challenges and Goals

Because A&P I lecture and lab is a requirement for numerous programs, it is important that students do well in the course. Future courses build upon the content in A&P I, so a strong understanding of its concepts is critical for ongoing academic success.

Prior to fall 2014, the department was struggling with a high rate of students' withdrawing or failing (D/F/W). Faculty sought a way to identify at-risk students earlier in the course in order to provide needed remediation with the goal of improving retention and success rates. The course was also challenged by numerous instructors and no common course components. As a result, content and grading tended to be inconsistent across sections. Therefore, a second goal was to establish a more uniform course structure across all sections to ensure that all required learning outcomes were being met.

In fall 2014, Esser's department implemented a diagnostic test using the Getting Ready for A&P content in MasteringA&P. Getting Ready for A&P includes diagnostic questions covering basic content required of students coming into the class in order

<sup>1</sup><https://www.mercy.edu/about-mercy/fast-facts>.

to have the highest chance of success. Faculty assigned the diagnostic assignment during the first week of class to evaluate student preparedness and with a secondary goal of evaluating if the Getting Ready for A&P diagnostic scores could help identify at-risk students.

## Implementation

The Getting Ready for A&P (GRA&P) diagnostic assignment was administered during the first week of class as part of MasteringA&P homework. The assignment included 51 questions and evaluated student performance on basic study skills, math skills, anatomical terminology, chemistry, cell biology, and other basics of the human body.

Students who completed the Getting Ready for A&P diagnostic assignment received automatic feedback that explained the correct answers and why the information was relevant. Feedback also pointed students to remediation resources in the *Getting Ready for A&P* booklet by Lori K. Garrett.

The goal of this study was to test and measure the relationship between the Getting Ready for A&P diagnostic test scores and course outcomes. To measure how the data collected from Getting Ready for A&P could be used to identify at-risk students, instructors collected data from the Getting Ready for A&P diagnostic questions in MasteringA&P from the fall 2014 and spring 2015 semesters.

### Assessments

#### Lecture (fall 2014)

- 75 percent Exams (three)
- 15 percent Assignments (homework)
- 10 percent MasteringA&P assignments

#### Lab (spring 2015)

- 75 percent Practicals Exams (three)
- 10 percent Quizzes
- 10 percent MasteringA&P
- 5 percent Homework (lab) assignments and participation

## Results and Data

In fall 2014, 140 students were enrolled in the course; the Getting Ready for A&P diagnostic assignment was administered in lecture during the first week of the semester. Of the enrolled students, 34 (24 percent) had a score of 0. These students were considered to have skipped the assignment. Study results show that more than half of those students earned a D, F, or W in the course, compared to 25 percent of the students who attempted the assignment (Table 1).

Course Grade	Distribution of Students Who Took GRA&P Fall 2014	Distribution of Students Who Skipped GRA&P Fall 2014	Distribution of Students Who Took GRA&P Spring 2015	Distribution of Students Who Skipped GRA&P Spring 2015
A	14%	6%	34%	23%
B	33%	12%	36%	21%
C	28%	26%	11%	18%
D	14%	32%	2%	12%
F	7%	15%	2%	12%
W	4%	9%	1%	15%
FW	NA	NA	12%	0
No Grade	NA	NA	1%	0
	(n = 106)	(n = 34)	(n = 97)	(n = 34)

Table 1. Grade Distribution of Students Taking and Not Taking Getting Ready for A&P, Fall 2014–Spring 2015 (N = 271)

In spring 2015, the Getting Ready for A&P diagnostic assignment was administered in the lab portion of the course during the first week of class. The same students take both lecture and lab during the same semester, but the course assessment is different. There were 131 students enrolled in the course; 34 students (26 percent) did not attempt the diagnostic assignment. Of those students, 39 percent earned a D/F/W, compared to 18 percent of students who attempted the assignment (Table 1). Further study will need to be done to understand why students decided to skip the Getting Ready for A&P assignment, but motivation or intention to stay in the course may be a variable that affects their decision.

Data was analyzed to better understand student performance based on Getting Ready for A&P diagnostic pretest performance. Because the study was focused on understanding if identifying student's prerequisite knowledge levels could be an indicator of course performance, only students who had a score for the diagnostic assignment were included in the following analysis. Figures 1 and 2 (following page) show the average GRA&P diagnostic scores based on final course grades. Students who earned higher course grades tended to have higher Getting Ready for A&P diagnostic assignment scores; students who earned lower course grades tended to have lower diagnostic assignment scores.

Students who withdrew had a higher average Getting Ready for A&P diagnostic score than those who earned a D or F in the course. Students withdraw for a variety of reasons, both academic and personal; there was no data available for this study to identify why students withdrew from the course. However, students who received a D or F in the course had the lowest diagnostic scores in both semesters of the study. Students who earned a D or F represented a low percentage of those in the

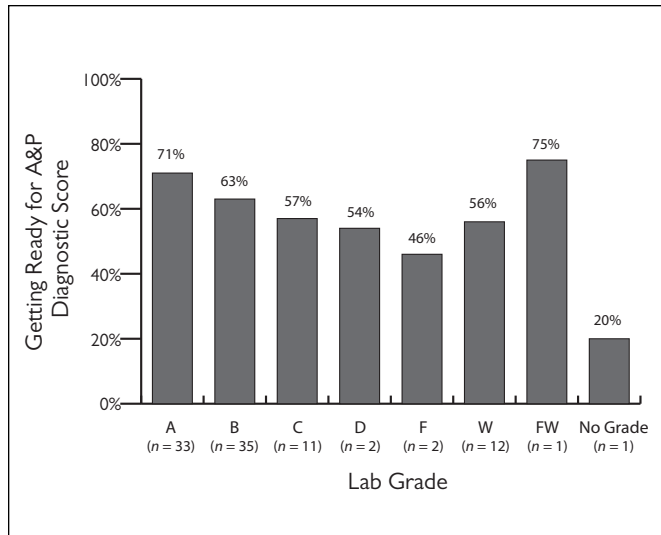


Figure 1. Getting Ready for A&P Pretest Diagnostic Scores by Course Grades, Spring 2015 (N = 97)

spring 2015 semester (4 percent); 22 percent of students in the fall 2014 class earned a D or F. The change in distribution may be due to variations in students or could be impacted by the differences in assessments in lecture and lab. Further analysis would need to be done to understand the differences.

Although grades were collected from different activities in the two semesters of the study, data showed that the students who performed better in the course had higher Getting Ready for A&P diagnostic pretest scores. This indicates that they likely came into the course with a higher level of prerequisite knowledge. Based on the results of this study, the department implemented changes for fall 2015 in an attempt to address students who were entering the course less prepared.

## Conclusion

Since the data evaluated from this study indicated that students who earned higher grades in the course tended to have scored higher on the Getting Ready for A&P diagnostic pretest, the department made changes for fall 2015 both to address those students who may be most at risk and to provide additional help to all students taking the course. An optional, noncredit recitation course was added to the course schedule. Attendance is optional and open to all students in A&P I. The recitations are

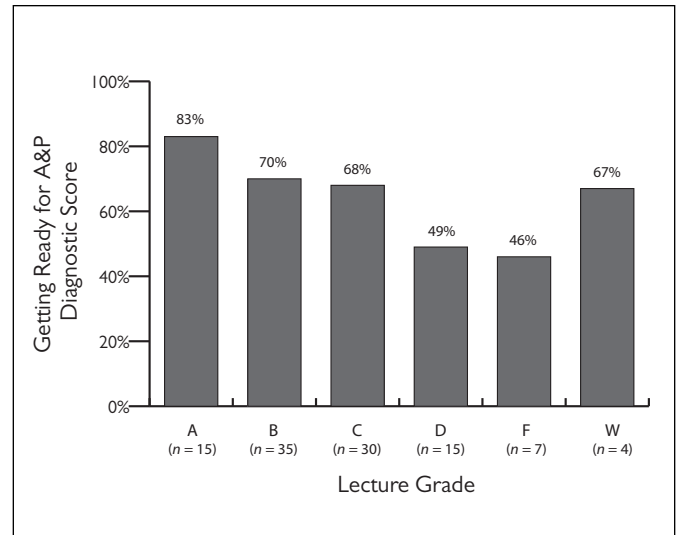


Figure 2. Getting Ready for A&P Pretest Diagnostic Scores by Course Grades, Fall 2014 (N = 106)

conducted by supplemental instructors, students who have completed and excelled in both A&P I and II. Since the Getting Ready for A&P diagnostic test indicates the level of prerequisite knowledge needed for the course, instructors plan to encourage individual students who score below 70 percent on the diagnostic test to attend the recitation sessions.

The department also now requires all instructors to use common MasteringA&P assignments, to include a common set of test questions on exams to track specific learning outcomes, and to cover the same content during the semester. Instructors still have flexibility in lecture, activities, and additional exam questions, but this change will enable the department to gather common data across all sections to evaluate learning outcomes and student success rates.

Each instructor will continue to assign the Getting Ready for A&P diagnostic assignment in order to gather data for use both during the semester to understand individual student needs and after the semester ends to analyze course results and evaluate learning and success. Finally, administrators will continue to evaluate course outcomes in order to make data-driven decisions about course format and content to further enhance learning and increase student success.

Implementation and results case studies share actual implementation practices and evaluate possible relationships between program implementation and student performance. The findings are not meant to imply causality or generalizability within or beyond these instances. Rather, they can begin to provide informed considerations for implementation and adaptation decisions in other user contexts. For this case study, mixed-methods designs were applied, and the data collected included qualitative data from interviews, quantitative program usage analytics, and performance data. Open-ended interviews were used to guide data collection.