

## MyReadinessTest and MasteringA&P with Knewton Adaptive Follow-Up

School Name West Kentucky Community and Technical College, Paducah, KY

Course Name Anatomy and Physiology I

Course Format Online

**Key Results** Combined use of MyReadinessTest and MasteringA&P with Knewton Adaptive Follow-Up enabled the instructor to more easily identify at-risk students and provided students with remediation tools that helped them succeed in the online course.

### Submitted by

Joseph D. Gar, Professor of Anatomy and Physiology

### Course materials

MyReadinessTest and MasteringA&P with Knewton Adaptive Follow-Up and *Visual Anatomy and Physiology*, Martini, Ober, Nath, Bartholomew, and Petti

### Background

West Kentucky Community and Technical College is a member of the Kentucky Community and Technical College System and is a public, two-year, degree-granting institution. In 2013, more than 7,000 students were enrolled, with 67 percent being part-time and 89 percent receiving financial aid.<sup>1</sup>

Anatomy and Physiology I is the first course in a two-semester sequence that covers the interrelationship of the structure and function of each body system. The first semester includes basic chemistry, cell structure, cell physiology, metabolism, tissues, and the integumentary, skeletal, muscular, and nervous systems. The course is primarily taken by students who wish to enter the nursing program and who must complete the course with a C or better to be admitted.

### Challenges and Goals

In 2013, the administration approached Professor Joseph Gar and asked him to develop and teach a new online Anatomy and Physiology I section. The goal was to determine the viability of offering both A&P I and II in a fully online format. Gar had taught this course as a face-to-face lecture and lab for many years. His challenge was to design online content that addressed the needs of students who were not meeting face-to-face for either lecture or lab and that enhanced their opportunities for success. He also sought a way to identify in a timely manner

students who were struggling and to provide resources to help them remediate.

### Implementation

In fall 2013, Gar piloted a small Anatomy and Physiology I online section. To monitor student performance in the online format, he implemented MyReadinessTest and MasteringA&P. He administered the MyReadinessTest diagnostic exam to students at the start of the semester. Students then received a personalized study plan that they could use for self-paced remediation during the semester.

Gar used MasteringA&P and Knewton Adaptive Follow-Up (AFU) for graded homework and the Practice Anatomy Lab (PAL), a virtual anatomy study and practice tool that offers access to widely used lab specimens, including human cadavers, anatomical models, histology, cats, and fetal pigs, to administer lab work.

MasteringA&P homework consisted of a parent assignment that students had 2–3 days to complete, and comprised a variety of MasteringA&P question types including tutorial, multiple choice, and true/false. In addition, AFU exercises, generated from an individual student's performance on the MasteringA&P parent assignment and designed to address that student's gaps in content knowledge, were assigned.

AFU exercises were set for extra credit. Students who earned 95 percent or more on MasteringA&P parent assignments tested out of the AFU assignment and received extra credit. Students scoring below 95 percent on the MasteringA&P parent assignment were required to complete AFU assignments in order to earn extra credit.

This combination of resources addressed several course needs. The MyReadinessTest diagnostic exam offered information about the knowledge base of students entering the course. Students were required to do the MasteringA&P parent home-

<sup>1</sup>WKCTC Fact Book, 2012–2013, p. 11

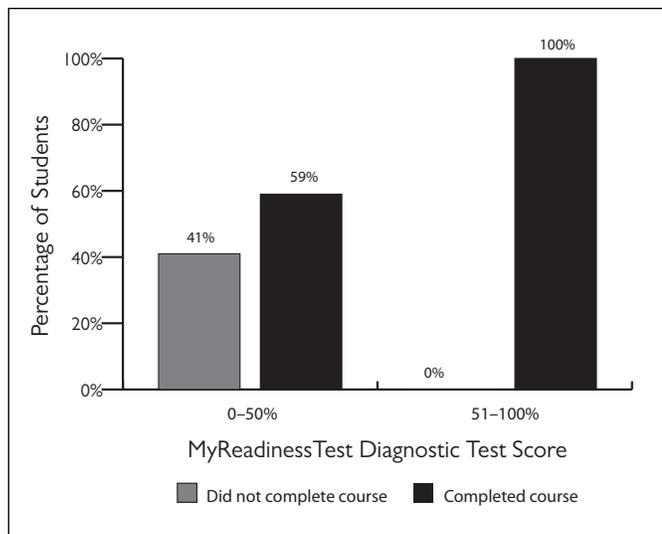


Figure 1. MyReadinessTest Diagnostic Test Score by Course Completion Status, Fall 2013 (0–50%, n = 21; 51–100%, n = 12)

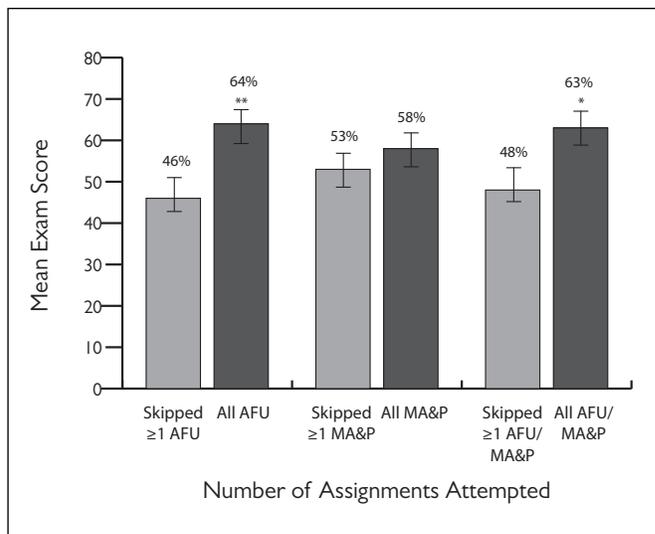


Figure 2. Mean Exam Score Based on Participation in MasteringA&P, Fall 2013 (All AFU, n = 20; skipped one or more AFU, n = 14; all MasteringA&P, n = 25; skipped one or more MasteringA&P, n = 9, all AFU/MasteringA&P, n = 19; skipped one or more MasteringA&P/AFU, n = 15) Error Bars = Standard Error, Significance, \*p <.05, \*\*p <.01

work, which identified how well they understood the current content, and the AFU questions generated from that assignment helped students work on content gaps.

The MyReadinessTest study plan, based on a student’s initial diagnostic score, provided extra practice that students could complete at their own pace throughout the semester and recorded a mastery score that enabled students to track their progress.

Gar reports that the resources enabled him to gain a better understanding of student performance, and helped students to better understand what they needed to do to succeed in the course—critical components of a successful online course.

**Assessments**

- 825 points MasteringA&P
- 24 points Lab reports
- 14 points Films on demand
- 10 points Lab exercise 1 test
- 15 points Lab exercise 2–5 test
- 10 points Lab exercise 6–8 test (optional)
- 2 points Lab Kit inventory and authentication

**Results and Data**

Results were based on the findings of the pilot section. After evaluating the MyReadinessTest diagnostic test scores for a relationship to course performance, Gar found that students who scored 50 percent or less on the MyReadinessTest diagnostic exam were more likely to not complete the course. Figure 1 shows that 100 percent of students who scored higher than 50 percent on the diagnostic test completed the course, but only 59 percent of students who scored lower than 50 percent successfully completed the course.

Gar also looked at how well students did on the exams based on their participation in MasteringA&P and Adaptive Follow-Up assignments. The analysis shows that students who either completed all of the AFU assignments or completed all of the AFU and MasteringA&P assignments had significantly higher exam averages (p = 0.0064, and p = 0.0182 respectively) than students who skipped one or more of these assignments (Figure 2). A skipped assignment was considered to be one with a score of 0. AFU assignments are generated specifically to address a student’s gaps in content knowledge, and the preliminary results from this study indicate that the individualized remediation may help increase student learning.

*[Knewton Adaptive Follow-Up] assignments are generated specifically to address a student's gaps in content knowledge, and the preliminary results from this study indicate that the individualized remediation may help increase student learning.*

## The Student Experience

To help his students develop good habits for the online course, Gar offered them tips on how to study anatomy and physiology, and encouraged students to work in study groups to facilitate peer-to-peer learning.

Gar also set up two types of online discussion boards: a live discussion area and an asynchronous discussion board. Gar occasionally interacted with students on the boards, but told them it was mainly for them to interact with each other. Students were instructed to e-mail him directly with any questions.

When Gar found comments or questions on the discussion board that should be emphasized or communicated to the whole class, he posted an announcement on the class website, which is also sent to each student's e-mail account. By establishing different types of communication channels, Gar hoped students would connect with each other and with him, even though they were not meeting face-to-face.

## Conclusion

Students are only permitted to repeat this course once, so success is very important as the majority of students must complete the course in order to move forward in their programs of choice. The lack of face-to-face contact presents challenges with regard to effectively identifying and helping at-risk students as early as possible.

While enrollments were small for this pilot, Gar believes that it was successful and that it provided a roadmap for teaching the course online. He used the MyReadinessTest diagnostic test as a leading indicator to help identify at-risk students from the beginning of the semester. And by assigning Knewton Adaptive Follow-Up exercises after the MasteringA&P parent homework, students received content designed to remediate specific gaps in their knowledge. In addition, students had personalized study plans generated based on their MyReadinessTest results, thereby enabling them to remediate as needed throughout the semester.

The study tools in both MyReadinessTest and MasteringA&P provided additional resources for students to use throughout the semester. By offering content in different places and formats, and helping students identify what they needed to study, these programs helped increase the potential for students to succeed in the online course. As a result of the pilot's success, the school now offers both A&P I and II online, and the online sections are the largest enrolled A&P courses at the school. Data will be evaluated in the future to determine if similar results are found with larger enrollments.