

Product Name **MasteringMicrobiology**

Course Name **Microbiology**

Credit Hours **Four**

Key Results Adding prelecture MasteringMicrobiology assignments facilitated increased student preparedness and engagement and enabled more time for interactive learning. As a result, student success rates increased and final course grades of A significantly increased.

Text

Microbiology, An Introduction, 11e, Gerard J. Tortora, Berdell R. Funke, and Christine L. Case

About the Course

This introductory Microbiology course is taken primarily by nursing students. It includes a lecture and a lab, and covers the principles of microbiology. Upon completion, students should be able to demonstrate knowledge and skills including microscopy, aseptic technique, staining, culture methods, and the identification of microorganisms.

Course Redesign

Our school serves many nontraditional students. The goal of the course redesign was to address the issue of underprepared students and to provide a resource for remediation outside the classroom.

We implemented the Supplemental model developed by the National Center for Academic Transformation. This model retains the basic structure of the traditional course and supplements lectures and textbooks with technology-based, out-of-class activities, or changes what goes on in the classroom by creating an active learning environment within a large, lecture hall setting.

From our experience in this departmentwide redesign, we identified the following best practices:

- Involve faculty as part of the planning team.
- Communicate redesign goals and keep faculty communication channels open.
- Set a timeline and include benchmarks to ensure the process continues to move forward.

- Provide students with start-up guidance, information for technical support, and an explanation of the value of Mastering.
- Reinforce the value of doing assignments before lecture.

Implementation

Starting fall 2012, we implemented Mastering in Anatomy and Physiology I and II, General Biology I and II, General Chemistry I and II, and Microbiology. We added Mastering to Introductory Physics in spring 2013.

Instructors are required to assign prelecture homework, but have flexibility with regards to the assigned content. The majority of instructors give weekly Mastering assignments that include both tutorial and end-of-chapter questions.

Instructors report that the automated grading in Mastering makes it easier to assign graded homework and to understand where students need help. Beginning spring 2013, we added student learning outcomes to our Mastering homework to (1) facilitate a better understanding of student course and program performance and (2) inform decisions on course changes.

Assessments

50 percent	Lecture exams
15 percent	Final exam
15 percent	MasteringMicrobiology homework
15 percent	Lab (participation, reports, practicals, exams)
5 percent	Other

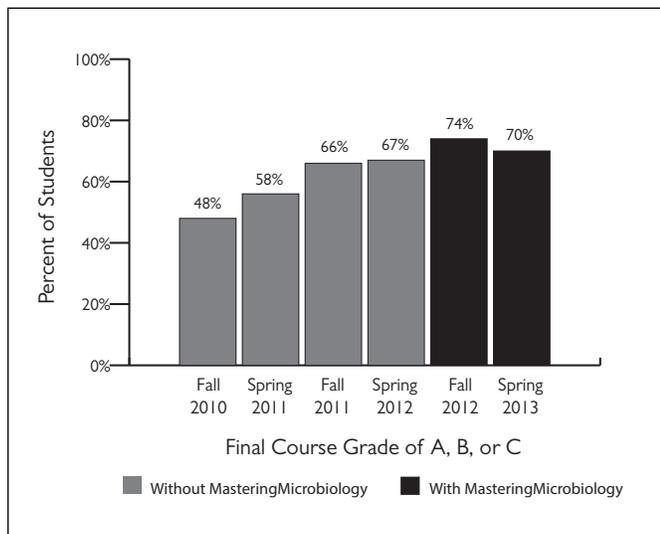


Figure 1. Microbiology Final Course Grades of A, B, or C with and without MasteringMicrobiology, Fall 2010–Spring 2013 (Fall 2010, $n=69$; Spring 2011, $n=72$; Fall 2011, $n=58$; Spring 2012, $n=57$; Fall 2012, $n=31$; Spring 2013, $n=57$)

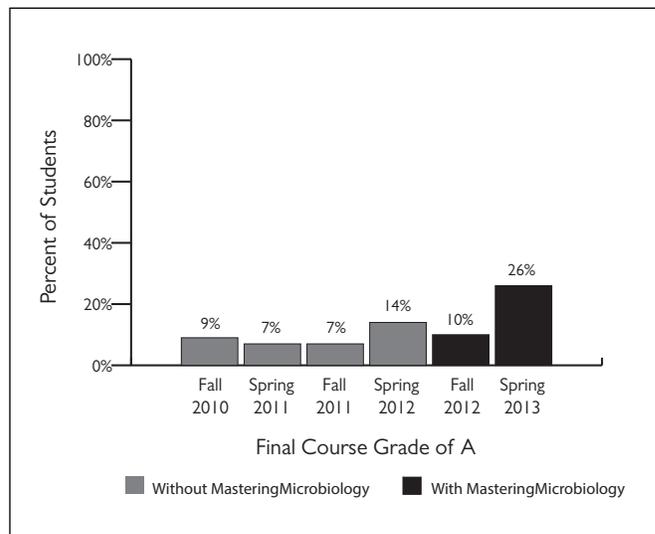


Figure 2. Microbiology Final Course Grade of A with and without MasteringMicrobiology, Fall 2010–Spring 2013 (Fall 2010, $n=69$; Spring 2011, $n=72$; Fall 2011, $n=58$; Spring 2012, $n=57$; Fall 2012, $n=31$; Spring 2013, $n=57$)

Results and Data

Analysis of student learning outcomes for Microbiology since fall 2010 show that success rates increased after implementation of MasteringMicrobiology (figure 1). The percentage of students who earned an A in spring 2013 was 12 percentage points higher than the highest reported semester in which MasteringMicrobiology was not used (figure 2).

In addition, the average MasteringMicrobiology homework score for students earning an A or B in the course is 86 percent, and the average MasteringMicrobiology homework score for students earning a C or D in the course is 68 percent.

The Student Experience

Students like the opportunity to walk through content prior to lecture, are more engaged in learning, and are more prepared for class. They report that they like using the Study Area, getting automatic feedback while working, and having resources in different formats, such as videos.

Student comments include:

- “[MasteringMicrobiology] helped me better understand the chapters as I did the required assignments.”
- “I liked that all the information for the chapter I was working on was all in one place... The animations broke down the information really well.”

Conclusion

We redesigned our science courses adding Mastering to provide students with a tool to help them prepare for class and get help when they need it the most. Prelecture homework assignments engage students in course content outside of class and better prepare them for lecture. This in turn enables us to increase the amount of interactive learning and critical thinking activities during class.

*Submitted by Louis McIntyre, Science Department Chair
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