BOWLING GREEN STATE UNIVERSITY–FIRELANDS COLLEGE — Huron, OH

Product Name	MasteringGeology
Course Name	Introduction to Geology
Credit Hours	Three

Key Results Students using MasteringGeology are more engaged and do more independent learning resulting in higher student success rates.

Text

Earth: An Introduction to Physical Geology, 10e, Edward J. Tarbuck, Frederick K. Lutgens, and Dennis G. Tasa

Implementation

Introduction to Geology covers physical geology, including its economic, social, and environmental aspects and is open to all nongeology majors.

I previously taught this course at another university where I'd used MasteringGeology. In fall 2012, when I first taught the course at Bowling Green State University, books had already been ordered by the time I arrived and MasteringGeology had not been included. I taught the course that semester without assigning any homework other than reading. In spring 2013, I required students to use MasteringGeology. I gave a weeky assignment, which covered one chapter and was due after I finished covering the topic in class. Using the estimated time ratings in MasteringGeology, assignments were designed to take about 40 minutes to complete. Questions included primarily tutorial and activity questions, such as animations and Google Earth™, to engage students and help them learn as they complete their homework.

I now use MasteringGeology each semester. I review the gradebook diagnostics as students complete the homework to identify issues or misconceptions, and then address those topics in the following class.

I'm a proponent of active learning and in-class activities. Using MasteringGeology, students can learn the basic concepts outside of class, so we can spend more class time doing interactive learning, such as discussion and writing exercises. For example, one discussion was on the Mars Rover mission and included the type of data they were collecting and how it relates to what students were learning about sedimentary rocks and environments. After discussion, students were asked to write a short paper in class about sedimentary rocks on Mars—including the writing portion ensured that students were engaged and understood the concepts discussed during the class activity.

Assessments

30 percent	Exams (three)
30 percent	MasteringGeology homework
20 percent	Comprehensive final
20 percent	Quizzes

Results and Data

My student success rate (A/B/C) increased by 10 percentage points (figure 1) after I implemented MasteringGeology in spring 2013. In addition, there is a strong correlation between the students' exam and MasteringGeology scores (figure 2).

I also found that students who score higher on their MasteringGeology homework tend to do better in the course. Figure 3 shows the average MasteringGeology score for students earning each letter grade. Students who earned an A in the course scored an average of 94 percent on their MasteringGeology homework; students who earned an F in the course scored an average of 26 percent on MasteringGeology homework. This includes all students who received a final course grade. In addition, 74 percent of students who earned an A/B/C in the course scored an 80 percent or higher on their MasteringGeology homework.

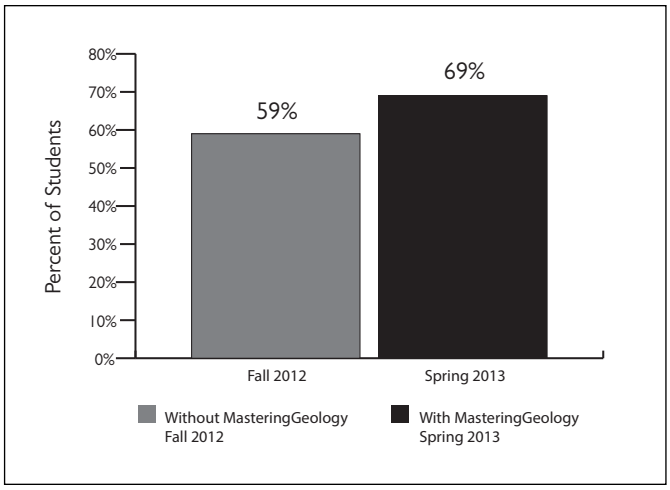

Figure 1. Student Success Rates (A/B/C) with and without the Use of MasteringGeology, Fall 2012–Spring 2013 (Fall 2012 *n*=51, Spring 2013 *n*=49)

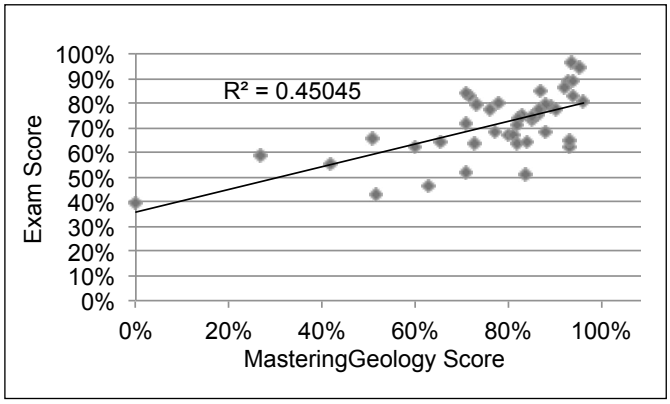

Figure 2. Correlation of MasteringGeology Homework Score to Exam Score, Spring 2013 (*n*=49)

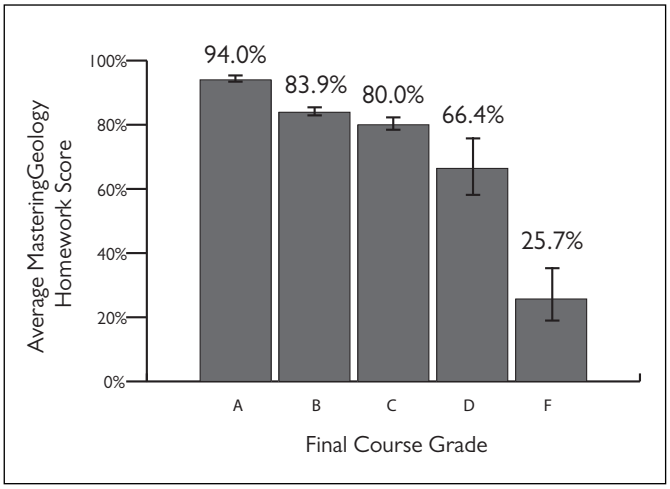

Figure 3. Average MasteringGeology Homework Score per Final Course Grades, Spring 2013 (*n*=49)

The Student Experience

Once students start using MasteringGeology, they really like it. The videos and animations help them visualize what they read in the textbook, which in turn helps them better comprehend the course content. And because students do additional learning on their own, I'm able to do more in-class activities, which helps create a more engaging environment in the classroom.

Conclusion

MasteringGeology enables me to engage students and helps them to learn outside the classroom so we can do more interactive learning in the classroom. The three-dimensional aspect of many geologic processes is difficult for students to understand via solely reading or lecture. The videos, animations, and activities in MasteringGeology help students to see and comprehend the processes. As a result, we can do more critical thinking activities in class, including applying the concepts to current events and their everyday lives.

Submitted by Daniel Kelley
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