

Product Name MasteringChemistry

Course Name Organic Chemistry I and II

**Key Results** By using English-language textbooks with MasteringChemistry, Chinese instructors are better able to assess those students who are developing chemistry skills in both English and Chinese.

## Text

*Organic Chemistry*, 8e, Leroy G. Wade

## Implementation

Organic Chemistry I and II is a required, two-course sequence for Chemistry majors that covers the basic reactions of organic chemicals. The sequence is taught as a bilingual course with two main goals. First, from a professional standpoint, imported English textbooks offer the most up-to-date content, a logical arrangement, and precise concept descriptions. These textbooks are supplemented with Chinese chemistry books, thereby enabling students to grasp the basic chemical concepts and fundamental theories, while still learning about the trends and developments in the field of chemistry. Second, from an educational standpoint, the university's goals are to help students build the skills needed for international exchange and to compete in the science and technology field.

The bilingual courses benefit students in a variety of ways: they improve their English listening, speaking, reading, and writing skills; as well as their English thinking and problem-solving skills in chemistry. In addition, because bilingual teaching courses are based on Western practices, they help students widen their scope of thought, develop more independent thinking skills, and improve their ability to apply chemical concepts in real applications.

Our first objective is to establish learning goals and elicit study interests. With English textbooks, students learn about international standards and have a greater passion to study, both of which can help lead them toward careers in research. After taking the course, many students become actively involved in the bachelor scientific research team.

Step-by-step teaching is important in this course. I do that by using English chemical terms and chemical equations and encouraging students to express chemical concepts and definitions in English. Because of the students' level of English-language skill, I start the course in Chinese and gradually add English until I am teaching almost solely in English. By the end of the courses, students can answer chemical problems in English.

We cover theory before detailed chemical compounds, thereby enabling students to manipulate complex compounds in later lessons. A series of tutorial groups are set up and students are asked to present organic chemistry topics in English.

### Use of MasteringChemistry

The multimedia resources in MasteringChemistry help students better prepare for class and become accustomed to learning course content in English. MasteringChemistry's diagnostics enable me to pay special attention to student performance. They also help me identify which concepts students find difficult and where I need to provide help.

Another focus of the course is concepts from daily life and high-tech industry. Instructors hold tutorials and give students opportunities to discuss and present in English the concepts they've learned. Because students feel that this helps them improve their professional English-speaking skills and broaden their knowledge of chemical concepts, it creates enthusiasm for learning organic chemistry.

Other course activities include organic experiments, open discussions, and guest lectures by famous foreign professors.

Exams are closed book and the difficulty of class exercises and student interview is gradually increased to promote self-motivation.

*“Students who steadily work with MasteringChemistry tend to have better course grades.”*

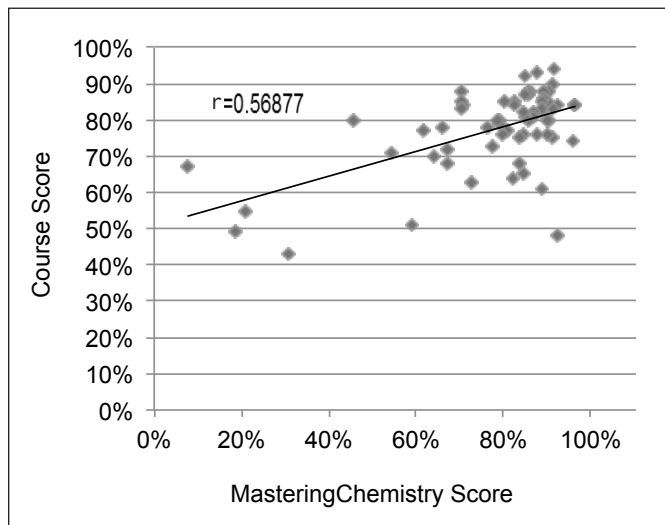


Figure 1. Correlation between MasteringChemistry Score and Course Score

#### Assessments

50 percent	Final exam
30 percent	Midterm exam
10 percent	MasteringChemistry homework
10 percent	Paper-and-pencil homework

#### Results and Data

I compared MasteringChemistry homework scores to the total course scores and found that there is a correlation between how well they do on daily MasteringChemistry assignments and how well they do in the course. Students who steadily work with MasteringChemistry tend to have better course grades (figure 1).

#### The Student Experience

I surveyed the students who used MasteringChemistry, and the overall feedback was positive, with a majority of students recommending MasteringChemistry be used in future classes:

- 83 percent      Students who recommended instructors use MasteringChemistry for future classes.
- 77 percent      Students who reported that their experience using MasteringChemistry was excellent or good.
- 66 percent      Students who reported that MasteringChemistry helped them to achieve a higher course grade.

Although there were some student issues with connection speed and software, most students found MasteringChemistry to be helpful in learning basic concepts and improving problem-solving skills. Using MasteringChemistry makes it easier for me to follow the students' progress and understand their needs. I can then adjust my teaching to address those needs and intervene earlier with students who are having problems.

Student comments include:

- “[MasteringChemistry] is really helpful. It would not let me practice the question continuously until I answered it correctly. However, the hints make it easier—after using the hints to help answer the question, the answers showed. That made me think.”
- “MasteringChemistry is very good. It helped teach Organic Chemistry more visually.”
- “MasteringChemistry showed me the details I needed to know and challenged me because it only uses English.”

#### Conclusion

We see improvement in student performance since using MasteringChemistry and will continue to use it as our online homework as a way to emphasize continuous assessment.

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