

## MyReadinessTest

School Name Robeson Community College, Lumberton, NC

Course Name General Chemistry I

Course Format Lecture and lab

**Key Results** Student scores on the MyReadinessTest diagnostic exam were predictive of student success in the course.

### Submitted by

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### Course materials

*Principles of Chemistry: A Molecular Approach*, Tro

### About the Course

Robeson Community College, one of 58 community colleges in North Carolina, is located in rural Robeson County. In 2012, the county had the highest county-level poverty rate in the state and it consistently ranks as one of the poorest counties in the nation.<sup>1</sup> More than 38 percent of the county population identifies as Native American.<sup>2</sup> The college is an open-door, two-year community college with a full-time enrollment of approximately 2,500 students. The school's six-year graduation rate for the 2007 cohort was 38.6 percent.<sup>3</sup>

General Chemistry I is the first course in a two-semester sequence covering the fundamental principles and laws of chemistry. Upon completion, students are able to demonstrate an understanding of fundamental chemical laws and concepts as needed to pursue further study in chemistry and related professional fields. This is a college-transfer course that includes both lecture and lab components. The majority of students who take this course are nursing majors or plan to transfer to a four-year institution.

### Challenges and Goals

Robeson serves many nontraditional, first-generation college students. As such, a high number are not college ready and require remediation to succeed. In 2012, the science department conducted a Mastering-enabled redesign across all science courses to address the issue of underprepared students and to provide a resource for remediation outside the classroom. Other goals for the redesign included reducing the time and labor needed to grade homework and developing an effective way to track learning outcomes. An evaluation of the results of four redesigned science courses—Anatomy and Physiology, Biology, Chemistry, and Microbiology—was published in *MyLab & Mastering: Science and Engineering*, V.4.<sup>4</sup>

The enrollment of students in General Chemistry I who are without the background and skills needed continues to be an issue impeding success, and identifying these students as early as possible is an important goal. Because MyReadinessTest provides a diagnostic exam that assesses students' skills on targeted topics applicable to chemistry, the decision was made to administer this to students starting in fall 2013. The hypothesis was that performance on the MyReadinessTest diagnostic exam taken at the start of the semester would serve as a predictor of student success, identifying students who may be at risk, from both academic and technological standpoints.

### Implementation

Beginning in fall 2013, the MyReadinessTest diagnostic exam was administered to students as a required assignment during the first week of the semester. MyReadinessTest then generates a personalized study plan based on those results. Students had the opportunity to use the study plan for remediation throughout the semester on their own time as an optional learning

<sup>1</sup>North Carolina's counties remain in poverty's tight grip, Tazra Mitchell, North Carolina Budget and Tax Center, Poverty and Policy Matters (<http://pulse.ncpolicywatch.org/2014/01/11/north-carolinas-counties-remain-in-povertys-tight-grip/#sthash.Nt6bLeXs.dpuf>).

<sup>2</sup><http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>.

<sup>3</sup>NC Community Colleges Creating Success, North Carolina 2014 Performance Measures for Student Success ([http://www.nccommunitycolleges.edu/sites/default/files/basic-page/2014\\_performance\\_report\\_5-12-14.pdf](http://www.nccommunitycolleges.edu/sites/default/files/basic-page/2014_performance_report_5-12-14.pdf)).

<sup>4</sup>MyLab & Mastering: Science and Engineering, V. 4, 2014, pp. 12, 28, 58, 86.

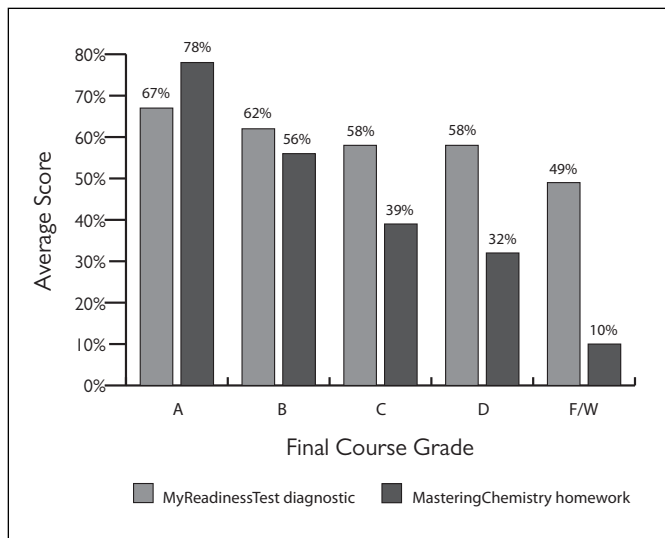


Figure 1. MyReadinessTest and MasteringChemistry Scores per Final Course Grade, Fall 2013 ( $n = 119$ )

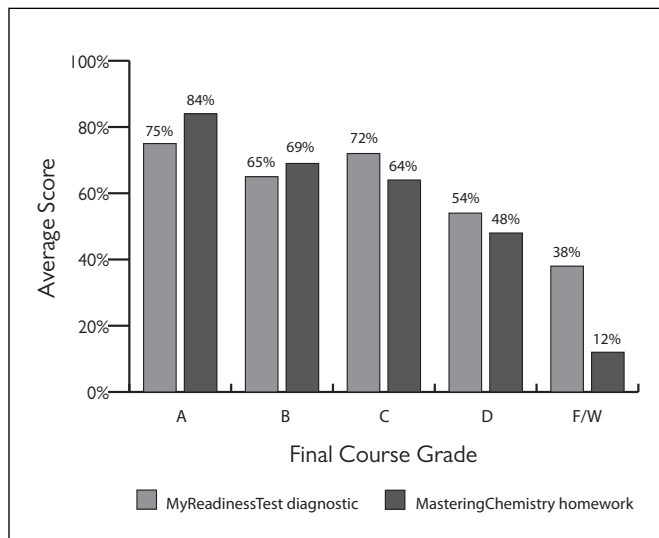


Figure 2. MyReadinessTest and MasteringChemistry Scores per Final Course Grade, Spring 2014 ( $n = 49$ )

resource. There were no other changes made to the course, and the MasteringChemistry prelecture homework assignments continued to be assessed at the same weight and due weekly.

#### Assessments

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

#### Results and Data

The MyReadinessTest diagnostic exam provides performance information on seven topics and, in turn, helps students identify problem-solving issues. Fall 2013 MyReadinessTest diagnostic exam scores indicated that the majority of students were not prepared for the level of math needed for General Chemistry I. The MyReadinessTest diagnostic exam score average was highest for students who completed the course with an A and lowest for students failing or withdrawing from the course (Figure 1). In addition, students who earned an A in the course tended to put more effort into MasteringChemistry homework and earned higher homework scores, while most D/F/W students put little effort into MasteringChemistry homework (Figure 1). The amount of time students spend working in MasteringChemistry and in MyReadinessTest can indicate motivation—a variable that can impact course results.

Based on findings from fall 2013, a decision was made to institute a benchmark score on the MyReadinessTest diagnostic test for spring 2014. Students were required to complete the MyReadinessTest diagnostic exam by a certain date prior to the semester start.

Students who scored 70 percent or higher on the MyReadinessTest diagnostic exam were placed in General Chemistry I unconditionally. Students who scored below 70 percent were placed in General Chemistry I conditionally and advised that they might need to take additional courses in order to succeed. Students who heard the advice and proceeded to take General Chemistry I were asked to sign a waiver stating that the instructor reviewed the syllabus and course requirements with them and that they understood they did not meet the preenrollment requirements. Students also acknowledged that they were proceeding in the course at their own risk.

There were 66 students at the start of spring 2014. Due to late registrations, only 49 completed the MyReadinessTest diagnostic exam. The following data includes only students who took the MyReadinessTest diagnostic exam. Figure 2 shows spring 2014 results, which were similar to those from fall 2013, in which A students earned higher diagnostic exam scores than students earning an F or withdrawing from the course. Data also showed that:

- Students who successfully completed the course with an A, B, or C averaged 76 percent on the MyReadinessTest diagnostic test.

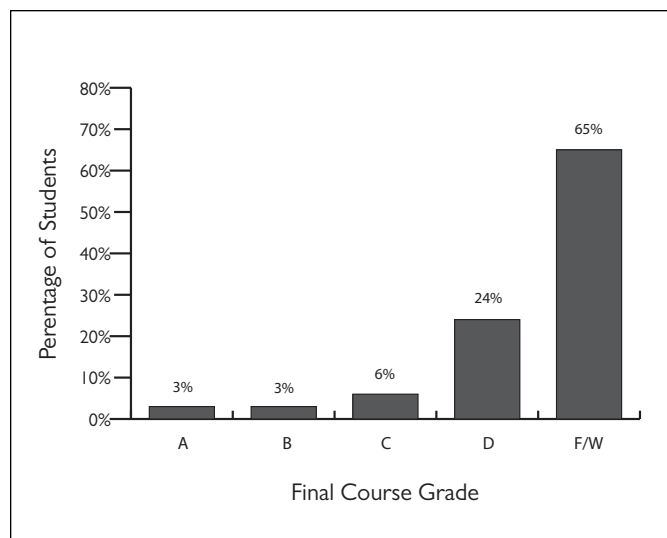


Figure 3. Grade Distribution for Students Scoring Less Than 70 Percent on the MyReadinessTest Diagnostic Exam, Spring 2014 ( $n = 34$ )

- Twenty-five out of 49 students who took the MyReadinessTest diagnostic exam withdrew from the course. Those students averaged 51 percent on the MyReadinessTest diagnostic exam.
- Twenty-two percent of students earned an F and scored an average of 62 percent on the MyReadinessTest diagnostic exam.
- Eighty-nine percent of students who earned below 70 percent on the MyReadinessTest diagnostic exam failed or withdrew from the course (Figure 3).

These results show that the MyReadinessTest diagnostic exam scores can be leading indicators of at-risk students. Based on these findings and due to the high number of students who struggle in the course but need to complete it for their programs of study, the college agreed to implement a new developmental chemistry course that was offered starting in fall 2014.

Following are policies for the fall 2014 General Chemistry I course:

- Students pursuing a program of study that requires General Chemistry I must take the MyReadinessTest diagnostic exam for chemistry. Students who score less than 70 percent are advised to consider taking the Preparatory Chemistry course.
- Students pursuing an associates degree in nursing and scoring less than 70 percent on the MyReadinessTest diagnostic exam for Chemistry are required to take the Preparatory Chemistry course.

- Students who have not had high school chemistry or have not had it in the last five years are advised to take the Preparatory Chemistry course.

These changes, along with the addition of the MyReadinessTest diagnostic exam as a placement test, are designed to help students succeed in the course so they can pursue their academic goals.

### The Student Experience

Because General Chemistry I is a requirement for so many programs, students tend to enroll in the course despite the potential consequences that come with not being prepared for it. In spring 2014, the majority of students who signed the waiver and proceeded to the course—despite being advised about the risk—either failed or withdrew.

Robeson faculty and administration understand that students want to move forward in their academic programs, but until now they had limited options. Today, students who aren't prepared for a college-level General Chemistry course have the option of a developmental chemistry course. This enables underprepared students to remediate needed skills before attempting General Chemistry.

In a survey, students were asked if the MyReadinessTest diagnostic exam was a good indicator of student preparation for the math requirements of general chemistry. Following is one student's reply:

"I felt like I was prepared for Chemistry. However, because it may have been a while since I'd done that type of math, I didn't do as well [on the MyReadinessTest diagnostic exam] as I could have."

### Conclusion

Robeson Community College's student population is diverse, and many students are not prepared for college-level courses. To meet the challenge and improve outcomes, the school's science department implemented a departmentwide redesign. Adding MyReadinessTest to General Chemistry I provided instructors with an additional resource to help them identify, as early in the semester as possible, which students were most at risk of failing. Today, the school continues to analyze and track results to understand the impact of its redesign. Future plans include adding MyReadinessTest to the Anatomy & Physiology course and continuing to track outcomes for all courses.