

MasteringNutrition

School Name College of the Sequoias, Visalia, CA
Course Name Nutrition
Course Format Face-to-face, hybrid

Key Results Survey feedback indicated that study participants had a positive experience with MasteringNutrition and used program information to monitor their progress. In addition, course outcomes showed both a strong positive correlation between MasteringNutrition homework and exam scores, and a trend of higher exam scores for students attempting more MasteringNutrition assignments.

Submitted by
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Course materials
MasteringNutrition and *Nutrition and You* (custom), Joan Salge Blake

Setting

College of the Sequoias is a two-year community college serving primarily the residents of Tulare and Kings Counties. Established in 1925, the school's 2013/14 enrollment was more than 14,000 students: approximately 65 percent attended part time, 67 percent were under age 24, and 58 percent identified as Hispanic. For the 2007/08 cohort, 43 percent of students completed a degree, certificate, or transfer-related outcome within six years of starting their higher education.¹

Milli Owens, chair of consumer and family sciences, teaches the introductory Nutrition course. She has been teaching at College of the Sequoias for about 20 years, and has also worked as a hospital registered dietitian and a consulting registered dietitian. She also has held various other part-time positions that helped her to stay current in the field. She has taught introductory Nutrition in all course formats.

Approximately 400 students take Nutrition each semester, and it is taught by two full-time instructors and four to six adjuncts. The course has 10–12 sections, one of which is a large lecture of 180–200 students. The majority of sections are face-to-face, and typically five are hybrid.

The average fall fill rate for this course is 101 percent (2012–14).² Students who take the course include those seeking to enter the nursing program, those taking it as a general education course with plans to transfer, and associate degree students

with a science requirement, such as law enforcement students. Associate degree nursing students are not required to take Nutrition; however, most associate degree RNs plan to pursue a BS, RN, and Nutrition is a required course for that program.

Nutrition is a three-credit, one-semester course. It presents a scientific study of basic chemical, biological, and physiological principles and concepts of human nutrition. The course also includes the application of these principles to the individual and the translation of this knowledge into food choices throughout life. It has no lab component. The hybrid format requires six on-campus class meetings during the semester.

Course learning outcomes include the following:

- Students will be able to identify sources of carbohydrate and fiber.
- Given direction on and access to diet analysis software, students will be able to enter their foods for at least three days, demonstrate understanding of printout recommendations, and identify their most pronounced problem areas.
- Students will be able to identify sources of lipids and cholesterol.

Challenges and Goals

The large enrollment makes it difficult for instructors to interact with students on a regular and individual basis. Because of that issue, instructors sought interactive online materials that could provide students with feedback and help when they needed it and promote more-frequent engagement with course materials. Owens adopted MasteringNutrition because it offered students 24/7 access to course materials, it increased course interactivity via audio and visual resources, and it provided a platform whereby both instructors and students could monitor student performance.

¹<http://www.cos.edu/About/Research/Pages/Fact-Book.aspx>.

²<http://www.cos.edu/About/Research/Program%20Review%20Narratives/2014-Nutrition-Foods.pdf>.

Owens engaged in this study to begin to evaluate and measure the relationship between engagement with course materials in MasteringNutrition and course performance. To begin to measure how her students engaged in practice and homework, Owens collected data related to MasteringNutrition assignments that she believed would be helpful for and aligned to the course learning outcomes.

Implementation

In spring 2015, Owens taught both face-to-face and hybrid sections. Because of differences in how MasteringNutrition was implemented in the two sections, the study examined the data for each section separately.

The face-to-face section consisted of the following assignments:

- **MasteringNutrition chapter quizzes.** Optional, untimed practice quizzes for extra credit.
- **MasteringNutrition MyPlate assignment.** A required, three-part assignment due midway through the semester. Two parts of the assignment were interactive NutriTools activities, and the remaining part comprised multiple-choice questions relating to the placement of foods in the MyPlate system.
- **Diet analysis project.** A required, semester-long project that required students to track their diet analysis needs. Students recorded what they ate for three days, used MyDietAnalysis in MasteringNutrition to analyze nutrient content, and completed a written assignment. They then used what they learned from this information to create a modified menu.

Six paper-and-pencil exams were administered. Exam 6 was a comprehensive exam, and the lowest exam grade was dropped. Exams comprised a mix of Pearson test bank and instructor-written questions. Course instructors do not use the same exams, but they do tend to share test questions to ensure that their exams are at a similar level.

For the hybrid section, the majority of course work was done in MasteringNutrition and consisted of the following assignments:

- **Homework assignments.** Required chapter homework comprised a variety of assignments and activities, primarily in MasteringNutrition, including NutriTools (interactive), animations, videos, and multiple-choice questions. Paper-and-pencil homework included an assignment to compare and contrast students' choices of cereal labels, and another to review local health department restaurant reviews.
- **MasteringNutrition chapter quizzes.** Unlike in the face-to-face section, untimed quizzes were required homework in the hybrid section.

- **MyPlate assignment.** A required assignment due midway through the semester (the same assignment as in the face-to-face section).
- **Diet analysis project.** A required, semester-long project that required students to track their diet analysis needs (the same assignment as in the face-to-face section).

Five exams were given in the hybrid section (the same exams as the first five given in the face-to-face section). There was not a comprehensive exam 6 offered in the hybrid section, and no exam grades were dropped.

Assessments

Face-to-face

500 points	Exams (six, lowest dropped)
125 points	MasteringNutrition diet analysis assignment (multiple parts)
50 points	MasteringNutrition MyPlate assignment
15 points	Activities and quizzes

Hybrid

1,000 points	Exams (five)
300 points	Homework (MasteringNutrition and paper and pencil)
130 points	MasteringNutrition chapter quizzes
125 points	MasteringNutrition diet analysis assignment (multiple parts)
90 points	MasteringNutrition discussion
30 points	Attendance

Results and Data

A study of spring 2015 Nutrition course data was conducted with 78 students in the hybrid section and 179 students in the face-to-face sections taught by Owens. Although MasteringNutrition quizzes were given in both formats, quizzes in the hybrid section were required as part of the grade, and the same quizzes in the face-to-face section were optional for extra points. Since quizzes were a common resource available to students, this analysis looked at quiz data compared to average exam performance in each section.

For the face-to-face students, the mean number of optional MasteringNutrition quizzes attempted by all students was 6 out of 13 (46 percent). Thirty-one students out of 179 (17 percent) attempted all optional MasteringNutrition quizzes, and 38 students (21 percent) attempted no MasteringNutrition quizzes (considered in this analysis to be one with a score of zero).

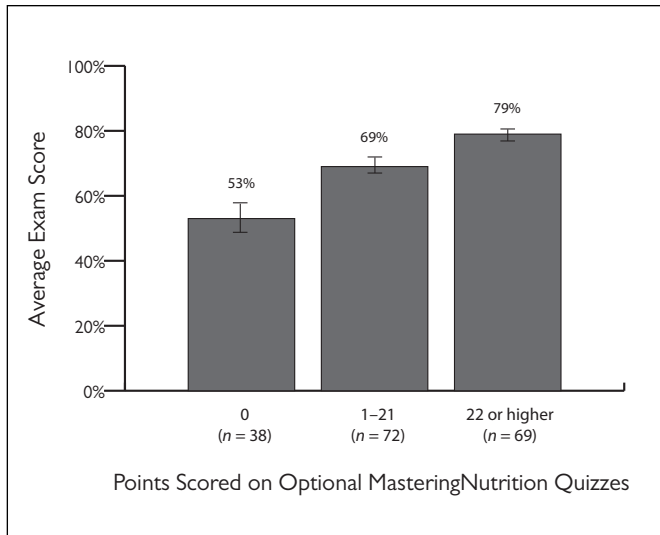


Figure 1. Exam Scores Based on MasteringNutrition Quiz Performance, Face-to-Face Section, Spring 2015 ($n = 179$)

Exam averages were analyzed by grouping students based on the number of points earned on the quizzes: students who had zero, students who scored 1–21 points, and students who scored more than 21 points. The average number of points for students who attempted at least one quiz was 21. Students who earned higher than the mean score of 21 had a statistically significantly higher exam average ($M = 79\%$; $SD = 11\%$; $N = 69$) ($p < 0.001$) (one-tailed t -test with unequal variances) than students who earned 1–21 points ($M = 69\%$; $SD = 15\%$; $N = 72$). Likewise, students who earned 1–21 points had a statistically significantly higher exam average ($p < 0.001$) (one-tailed t -test with equal variances) than students who did not attempt any quizzes ($M = 53\%$; $SD = 26\%$; $N = 38$) (Figure 1).

Because the MasteringNutrition quizzes were optional, there may be variables, such as motivation, that impacted student participation. Further research is needed to investigate this relationship between quiz completion and performance and exam performance.

Feedback from the end-of-semester survey of traditional students about the optional quizzes included the following comments:

“I was able to study by myself because the study guides and practice quizzes were available.”

“MasteringNutrition helped me learn during the course, because it provided a place to take practice quizzes and videos to show a demonstration of what we were learning in class.”

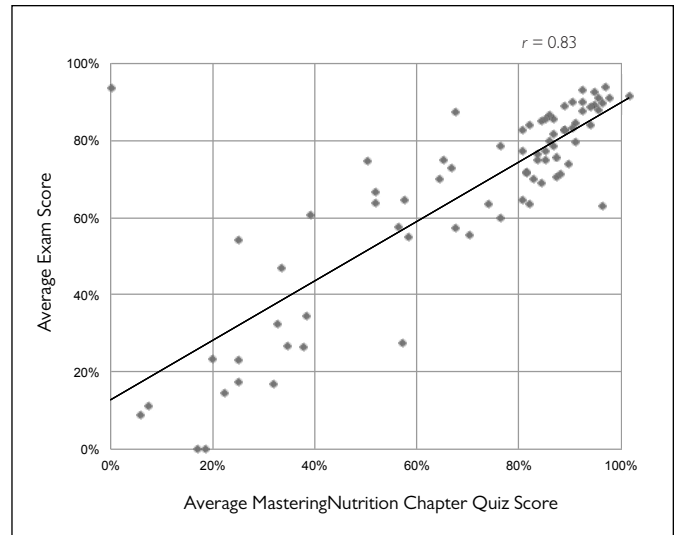


Figure 2. Correlation between Average MasteringNutrition Quiz Scores and Average Exam Scores, Hybrid Section, Spring 2015 ($n = 78$)

“The extra-credit quizzes really helped because by taking those quizzes I knew what would be on the test, and it also helped me see what I needed to study more.”

“I learned better with the quizzes I took for Nutrition.”

“The quizzes we took helped me before each exam. I think that helped me get better grades on the tests.”

For the hybrid section, MasteringNutrition quizzes were required assignments. Since this was a required activity, a correlation of the MasteringNutrition quiz scores to the exam average was calculated and showed a very strong positive correlation, with $r = 0.83$ (Figure 2). A correlation of the average score for the MasteringNutrition chapter homework assignments that were required prior to MasteringNutrition quizzes also showed a strong positive correlation of $r = 0.80$ to the exam average.

For the hybrid section, 50 students out of 78 (64 percent) attempted all required MasteringNutrition quizzes, and only one student attempted no quizzes. The average number of quizzes skipped by all students was 2 out of 14. The fact that quizzes were required likely impacted the participation rate for students in the hybrid section, compared to the optional assignment for face-to-face students.

In the hybrid section, students were expected to work more independently. As such, they were provided with more required MasteringNutrition homework. Student feedback from the hybrid section included the following comments about their experience using MasteringNutrition:

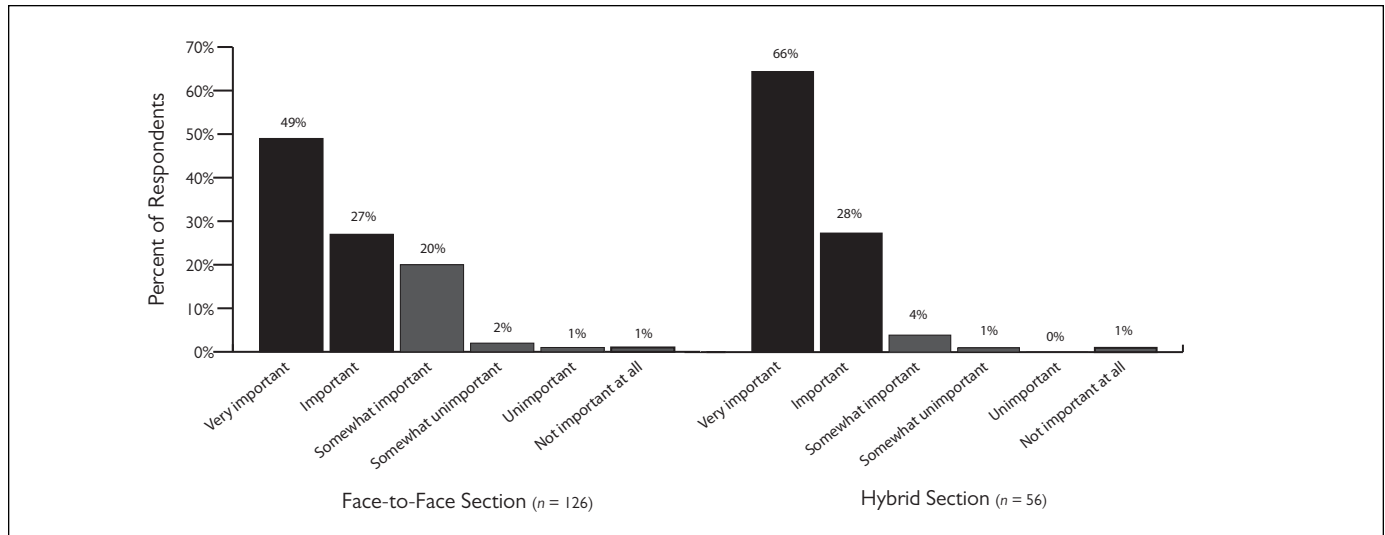


Figure 3. End-of-Semester Survey Responses to the Question, How important do you think the MasteringNutrition homework was to your success in this course? Spring 2015 (n = 182)

“MasteringNutrition had many resources for me to go to and get help. [It] usually always answered my question.”

“It kept me in the habit of checking for assignments, due dates, and also how to get familiar with online courses for future classes.”

“MasteringNutrition helped clarify areas in which I was not familiar by providing videos, charts, animations, [and] gamelike ways of learning. It is almost as if I had the professor there guiding me.”

The Student Experience

In spring 2015, an end-of-semester survey was offered to each section. In the hybrid section, 72 percent of students participated; in the face-to-face section, 70 percent of students participated. A majority of respondents from both sections indicated that MasteringNutrition was very important to their success in the course. For the hybrid section, 94 percent of respondents said it was very important or important, as did 76 percent of the face-to-face respondents (Figure 3). The reliance on more online work in MasteringNutrition for the hybrid component may have impacted the responses.

In the same survey, students were asked to describe how using MasteringNutrition impacted their learning. Comments included:

“It was extremely easy to use. When it comes to logging on and finding my assignments, I wasn’t frustrated and could start my homework with a calm head. In another [program], I dropped the class because the website was a pain.”

“I’m a stay-at-home mother of a five-month-old. [MasteringNutrition] helped me go to school and at the same time watch my baby. It helped me with all the side help, the study guides, and eText. It also reminded me when homework was due and reported my grade.”

Students were also asked to describe the three most important things they learned in this class. While the answer topics varied, a few specifically mentioned MasteringNutrition, including:

“(1) How to use my time wisely. (2) Pick up better study habits. (3) Watching the videos from MasteringNutrition helped tremendously.”

“(1) To use MasteringNutrition. (2) How to eat healthy. (3) Maintain a good weight.”

Conclusion

Nutrition at the College of the Sequoias is a consistently filled, large-enrollment course offered in both face-to-face and hybrid formats. Owens believes that providing all students with online, interactive resources to access at their convenience helps them engage with course content and offers them the opportunity to learn on their own—something particularly important for hybrid-course students. As one student said, “[MasteringNutrition] made learning easier.”