

OPTIMAL IMPLEMENTATION OF ONLINE QUIZZES FOR IMPROVED LEARNING OUTCOMES IN MARKETING PRINCIPLES COURSES

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Abstract

Quizzes are a popular tool for assessing learning in the classroom and professors are increasingly implementing them in an online setting (Buzzard et al., 2011). One decision that professors face when implementing quizzes online is what due date to set for the quizzes. Typically, students expect to complete quizzes after class discussion of quiz material, but recent research has highlighted the benefits of implementing quizzes prior to class discussion (Brothen & Warmback, 2004; Gurung, 2003; Johnson & Kiviniemi, 2009; Narloch et al., 2006). However, limited empirical evidence has directly compared the effectiveness of these two options. The goal of this paper is to determine which policy is more effective at increasing learning outcomes through an in-class experiment.

Experiment

Based on previous studies (Brothen & Warmback, 2004; Gurung, 2003; Johnson & Kiviniemi, 2009; Narloch et al., 2006) it was hypothesized that students who completed the online quizzes *before* class discussion of the quiz material would perform better on exams than those who completed the same quizzes *after* class discussion of the quiz material. Blackboard was utilized to implement the quizzes. For this experiment, all quizzes were set to a maximum duration of 2 hours at which point Blackboard would automatically submit the quiz for grading. Students were also told that all quizzes were open book and notes since there was no way to monitor students during online testing outside of the classroom. Additionally, students were only allowed to take the quiz once.

The quizzes themselves consisted of ten multiple choice questions that were adapted from publisher source materials, but curated specifically to highlight the most important concepts, in the eyes of the instructor, from each chapter of the text book. In order to operationalize whether quizzes were completed prior to class discussion of quiz material, two Blackboard items were manipulated. First, the due date of each quiz was set to either the day of the class discussion of the material (for the before condition), or the day of the final exam (for the after condition). Second, adaptive release was utilized for each quiz item, such that quizzes were not available to students until the end of the class session prior to the due date (for the before condition) or they were not available to students until the end of the class session in which the quiz material was discussed (for the after condition). Students were explicitly notified of the quiz due date policy both in the course syllabus for each class and by the instructor during the first class session of each course.

Design

Two hundred and forty-four undergraduate students participated in this experiment by enrolling in one of the author's four marketing principles class sections at 10am or 4pm in either the fall or winter quarters of a recent academic year. The quiz treatment was counterbalanced across the 10am and 4pm sections in the fall and winter terms in order to control for any effect resulting from differences in the time of day of the class. Thus the full experiment consisted of a 2 (quiz due date: before vs. after) x 2 (class time: 10am vs. 4pm) between subjects design.

Dependent Measures

All four marketing principles sections were required to complete two non-cumulative midterm exams (each worth 15% of the final grade) and one cumulative final exam (worth 25% of the final grade). Identical assessments were used for all exams across all four sections.

Covariates

Additional measures were collected to control for extraneous variables, specifically, students' cumulative grade point averages (GPA) prior to the term in which they were enrolled in the author's class (to control for intelligence and study habits) and their GPAs for the term in which they were enrolled (to control for history). Both covariates had significant effects on the dependent measures.

Results

Results across all three learning assessments (midterm 1, midterm 2, and the final exam) provide support for the hypothesis that students who complete quizzes *before* class discussion of quiz material perform better on exams than those who complete the quizzes *after* class discussion of the quiz material. However these effects were moderated by the time of day of the class. Specifically, individuals who took the class at 4pm and completed quizzes before class discussion performed better on midterms 1 and 2 than those who completed quizzes after class discussion; individuals who took the class at 10am showed no difference on midterms 1 and 2. Interestingly, individuals who took the class at 10am and completed quizzes before class discussion performed better on the final exam than those who completed quizzes after class discussion; individuals who took the class at 4pm showed no difference.

References Available upon Request