

A Comparison of Reading Response Methods to Increase Student Learning

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Abstract

It is common in college courses to test students on the required readings for that course. With a rise in online education it is often the case that students are required to provide evidence of reading the material. However, there is little empirical research stating the best written means to assess that students read the materials. This study experimentally compared the effect of assigned reading summaries or study questions on student test performance. The results revealed that study questions produced higher quiz scores and higher preparation for the quiz, based on student feedback. Limitations of the study included a small sample size and extraneous activities that may have affected general knowledge on a topic. Results suggest that study questions focusing students on critical information in the required readings improve student learning.

Keywords: online instruction, reading summaries, student outcomes, study questions

INTRODUCTION

Online instruction continues to increase in popularity with over 200 colleges and universities offering online instruction (National Center for Education Statistics, 2014) and at least 120 schools offering full online programs (National Center for Education Statistics, 2012). Convenience and flexibility are key benefits of online learning (Marks, Sibley and Arbaugh, 2005). Online learning eliminates physical barriers to education such as geographic distance, time constraints and household obligations (Hines and Pearl, 2004).

Means, Toyama, Murphy, Bakia and Jones (2009) conducted a meta-analysis that reported students learning online had better outcomes than those in traditional settings, presumably due to the delivery of content in multiple formats. Instructors may direct students towards publically available materials, online videos, blogs, texts or articles. Instructors may also create and distribute original materials including written content, audio-visual presentations and video lectures (Reinecke and Finn, 2015).

Educational research has identified several pedagogical features associated with positive student outcomes. These include, clear behavioral objectives, accurate and competent models, ample opportunities for active responding, immediate feedback regarding the accuracy of the response with reinforcement, teaching to mastery with frequent direct measures that are explicitly tied to the learning objectives and using outcome measures to drive instructional decisions (Heward, 2006; Moran and Malott, 2004; Skinner, 1968; Vargas, 2013). Of these, student engagement is the single best predictor of student learning (Gachago, Morris and Simon, 2011; Heward, 2006; Kuh, 2005; Skinner, 1968; Vargas, 2013) therefore, it is imperative to assess student

engagement in online learning. Reinecke and Finn (2015) evaluated student engagement with materials posted in online courses. Surprisingly, their results demonstrated that 20 to 55% of students did not access material, handouts or audio-visual lectures during weekly instruction, correlating the higher percentage with students who received the lowest grades.

Assessing student knowledge is one of the cornerstones of teaching. It is unclear, however, whether teachers know students are learning without assessing the knowledge through discussion, projects, tests/quizzes or similar means. The National Education Association (2015) suggests that instructors grade readings in order to increase student compliance with this task. However, the means to best assess whether the students have read the material has not been empirically evaluated. Hence, the purpose of this study was to compare the effects of two different types of evidence that students had read the required material based on weekly quiz scores. Students were assigned to write either a summary of that week's readings or answer instructor-developed study questions. Comparisons were made on quiz performance and student preference.

METHOD

Participants

The participants consisted of 62 graduate students enrolled in two online graduate courses in Applied Behavior Analysis. There were 57 female and 5 male participants (Table 1). The participants took these courses anywhere from their first semester in the program through the last semester.

Table 1
Participant Make-Up Per Course

	Female	Male
Course A	17	3
Course B	40	2

Setting

All courses were delivered entirely online and provided coursework sequence approved by the Behavior Analyst Certification Board (BACB®). Data were collected across two semesters of study, taught by three different instructors. The courses were delivered using the school's learning management system, Blackboard and Canvas (Blackboard, 2015; Instructure, 2015). Content and activities were arranged across 11 weekly topics. Each weekly topic contained assigned readings from either textbooks or readily available scholarly articles, which were posted on the course site. Additionally, each weekly topic contained links to audio-visual lectures, prompted forum discussions, instructions for weekly written assignments, specification of the reading summary, and a quiz.

Dependent Measures

The dependent variable was the mean score on the weekly quiz. Each week the students completed a ten-point quiz that ranged from 5-10 questions. The questions were based on the readings that were assigned for that week. All quiz questions were multiple choice or true/false. Although quizzes were automatically scored, grades were not posted until the quiz closed. All quizzes were timed and students had between six to ten minutes to complete it.

Experimental Design

The experimental design was an alternating treatment design (Kazdin, 2011). Each section was assigned the reading summary method with alternation across sections (e.g., if section 1 was assigned the study questions, section 2 was assigned the reading summary) or the study questions.

Independent Variable

The independent variable was the type of assigned reading summary, either written responses to study questions or a narrative summary of the readings. The study questions contained 6-15 questions per week, and students were told to write a response for each question in 4-8 sentences. The reading summaries were open-ended and required to be 2-4 pages, double-spaced.

The study questions were posted for students to answer, on paper, on the assigned week. Directions on the course site as well as syllabus were as follows:

“Evidence of Reading Assigned Materials: For each week, you will submit either answers to study guides or summaries of the readings.

You will be told which evidence of reading materials to do for each week:

study questions or response summaries.

- A. *Study Questions* - on some weeks, you will be given study questions that highlight what the instructor considers to be the important information in each respective required reading. Study question responses should each be 4-6 sentences that answer the question in your own words. Credit will not be given for answers taken word-for-word from the text or articles.

B. Reading Summaries – on other weeks, you will submit a reading response assignment that will be a reading summary. The reading summaries should be in APA format and should be comprised of a brief (2-4 pages) summary of the assigned readings for that week. Included in this summary should be a brief (half a page to one page) discussion of how you will incorporate the readings into your current or future setting. Credit will not be given for summaries taken word-for-word from the text or articles.”

Procedure

Each week the instructor assigned either the study questions or reading summaries to each course section in an alternating fashion. Students were able to complete the assignment at any time during the week and take the quiz after submitting the responses. Additionally, students were asked to complete a short survey regarding social validity (student preference) that included the preferred reading response method, method they felt produced greater learning, and method they felt prepared them best for the weekly quiz.

Interobserver Agreement

Interobserver agreement on the calculation of the mean scores was conducted on 33% of assignments across all four sections. Two of the professors independently calculated the mean score per section, per test and then compared the calculations. Agreement was 100% accurate for calculation of mean scores.

RESULTS

Results showed that, on average, study questions resulted in higher quiz scores across both classes (see Figures 1 and 2). Course A had an overall increase of 5.84% on test scores with the study questions (81.36% study questions; 75.52% reading summaries)

while Course B had a 2.59% increase of test scores with the study questions (78.24% study questions; 75.65% reading summaries). Further analysis of the data showed that 70% of students in Course A performed better when compared to themselves when assigned the study questions while 30% performed better across weeks with the reading summaries. Similar results were shown with Course B in that 58% of students performed better across weeks when assigned the study questions while only 29% of students performed better when assigned reading summaries. One participant performed the exact same on tests regardless of reading response assignment.

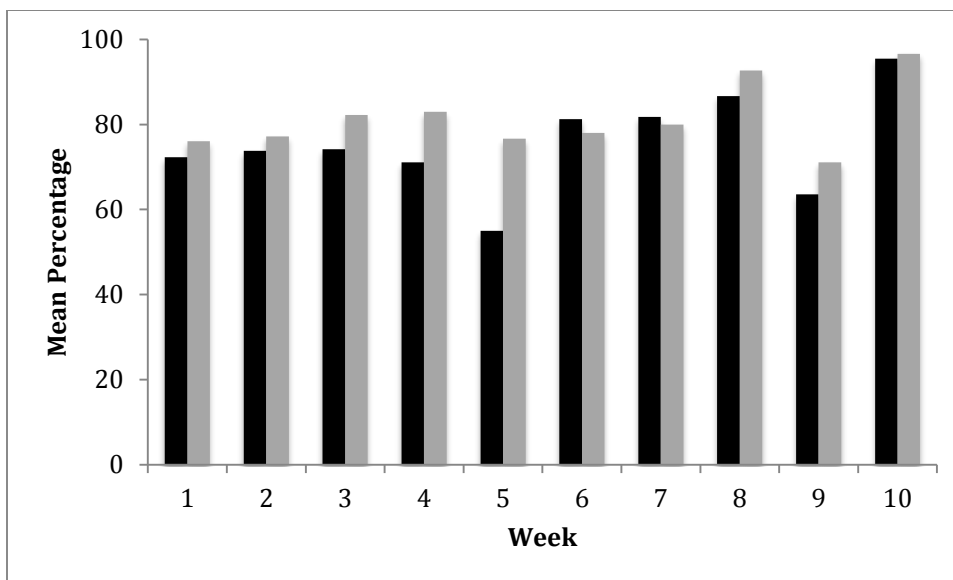


Figure 1. Weekly Mean Score for Reading Summaries (black bar) and Study Questions (Gray Bar) across Course A

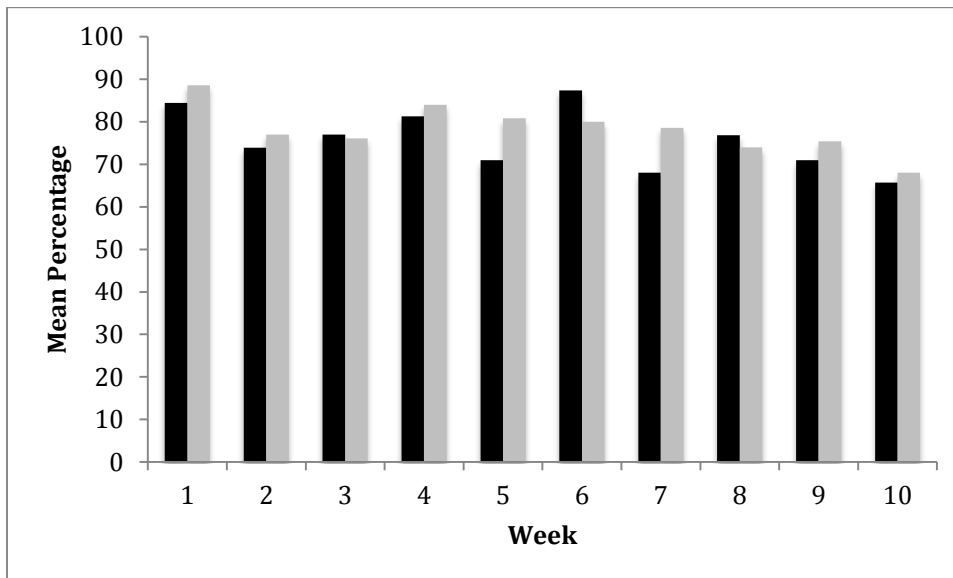


Figure 2. Weekly Mean Score for Reading Summaries (Black Bar) and Study Questions (Gray Bar) Across Course B

Social validity (student preference) data were conducted through an eight-question survey (see Figure 3). Participants reported spending slightly more time each week completing the study questions as opposed to reading summaries. Specifically, 77% stated spending more than two hours completing the study questions as opposed to 72% stating they spent more than two hours on the reading summaries. Sixty-six percent of participants preferred the study questions, and 83.3% reported that this method gave them a better “understanding of the material” or that it made them “read the material more carefully”. Ironically, only 66.7% stated that the study questions were the best method for learning.

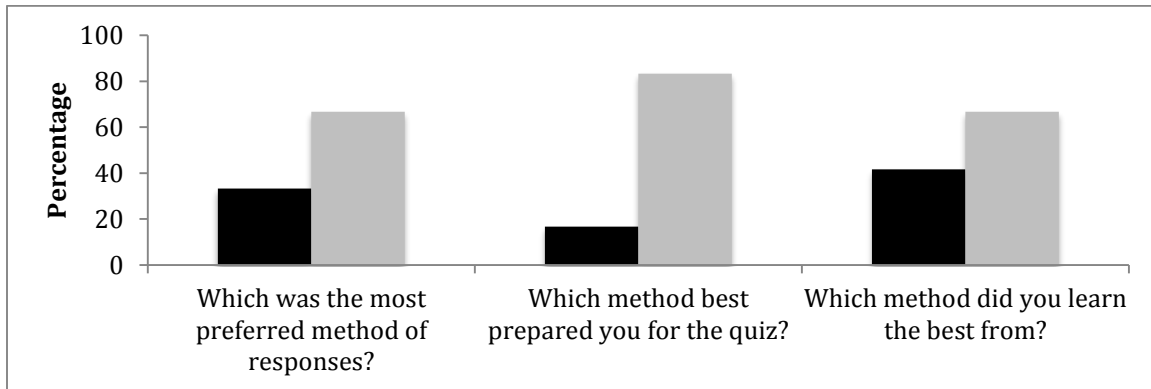


Figure 3. Social Validity Data for Reading Summaries (Black Bar) and Study Questions (Gray Bar) Across All Students

DISCUSSION

The purpose of this study was to determine if there was a difference in student outcomes when presented with different evidence of having read the materials, that of study questions or reading summaries. Students completed the assigned reading response at any time during the week and then took the quiz. Additionally, students completed a short survey regarding social validity that included the preferred reading response method, method they felt produced greater learning, and method they felt prepared them best for the weekly quiz. The results of the study demonstrate that study questions increased both weekly and overall student performance on weekly quizzes. In addition, participants reported this to be the preferred method for submitting proof of reading the materials.

The results demonstrated that study questions produced higher quiz scores as shown in 75% of the measured weeks. Factors that can be attributed to this are that the study questions were composed by the course instructor and highlighted the key components of the material, which were the basis for the weekly quizzes. Study questions

are similar to structured notes, a practice that has been shown to be effective in increasing student engagement (Heward, 2006; Vargas, 2013).

An interesting finding was that the social validity data revealed that some students preferred the reading summaries, yet reported that the study questions better prepared them for quizzes. Most students reported that the study questions prepared them the best for the quiz, which aligns with the course instructor highlighting the key points in the study questions and, in turn, developing quiz questions from these points.

There are several potential limitations to this study that could influence confidence in a causal relationship between evaluations of readings and test scores. There were extraneous variables that were not controlled such as forum discussion topics that may have influenced learning. In addition, participants' knowledge of the content was not assessed prior to each unit. Some people might think that the scores varied due to difficulty of the material during specific weeks, however, the alternating treatments design would refute this claim (Kazdin, 2011).

Future research should focus on continued ways to assess active engagement and immediate feedback to students while learning in an online environment (Geri, 2011; Grant and Spencer, 2003; Reinecke and Finn, 2015). Engagement is more than evidence of reading materials; engagement requires immediate feedback and ample opportunities to respond. Additionally, research needs to be conducted on whether exposure to course reading material increases learning, or if it simply promotes a better grade. Presumably, reading the required articles/text will increase tests scores, however, as Skinner noted, when testing students, "few learn at all" (Skinner, 1968, p.88). With advances in technology, ways to increase student engagement must be considered in online learning and evaluated for effectiveness and retention.

The results of this study support previous findings that clear behavioral objectives explicitly tied to the learning objectives (Heward, 2006; Moran and Malott, 2004; Skinner, 1968; Vargas, 2013) increase student knowledge, as demonstrated through an increase in tests scores when participants completed the study questions. With online instruction advancing in popularity, there is a need to better assess how to deliver online instruction, as typically the delivery is based on traditional classroom teaching methodology (Breslow et al., 2013; Mor, Minguillon, and Carbo, 2006; Neuhauser, 2002). It is essential that empirical methods be employed to assess learning in the distance format and thus move away from subjective measures of student learning that are commonly used in the literature today. There needs to be empirical research on the most effective method of delivery in online instruction and how these methods should differ from traditional classroom methods (Schacter and Szpunar, 2015).

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