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Assessment of Recall Versus Recognition in Online Learning and the Impact on Retention

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Abstract

A strong body of evidence reveals that quizzing students using low stakes assessments enhances learning and retention compared to not quizzing. In regards to learning and retention, the way in which students are quizzed is also important. Recall or retrieval practice has shown to enhance learning and increase retention compared to recognition quizzing. The current study evaluated the used of low stakes recall vs. recognition assessments in a hybrid course with weekly online lectures. Participants were divided into either the recall (n = 140) or recognition (n = 111) group. Average participation in low stakes assessments, percentage scores on high stakes assessments, and final exam percentage were compared between groups. The results revealed a significant difference between average low stakes assessment participation. No other statistically significant differences were found. Our study results did not find a signification difference between recall and recognition assessments in online lecturing. However, the type of assessment used did affect the amount of participation in the low stakes quizzes.

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ASSESSMENT OF RECALL VERSUS RECOGNITION IN ONLINE LEARNING AND THE IMPACT ON RETENTION

Amanda Anderson, M.S., & Warren Franke, PhD.

ABSTRACT

A strong body of evidence reveals that quizzing students using low stakes assessments enhances learning and retention compared to not quizzing. In regards to learning and retention, the way in which students are quizzed is also important. Recall or retrieval practice has shown to enhance learning and increase retention compared to recognition quizzing. The current study evaluated the used of low stakes recall vs. recognition assessments in a hybrid course with weekly online lectures. Participants were divided into either the recall ($n = 140$) or recognition ($n = 111$) group. Average participation in low stakes assessments, percentage scores on high stakes assessments, and final exam percentage were compared between groups. The results revealed a significant difference between average low stakes assessment participation. No other statistically significant differences were found. Our study results did not find a signification difference between recall and recognition assessments in online lecturing. However, the type of assessment used did affect the amount of participation in the low stakes quizzes.

BACKGROUND

Research has shown that low stakes quizzes or assessments using recall enhances learning, increases retention, and enhances metacognition (McDaniel & Agarwal, 2011; Roediger & Karpicke, 2006; Roediger, Agarwal, McDaniel, & McDermott, 2011). Most of this research has been conducted in a face-to-face classroom setting and little work has been done in hybrid courses where the lecture and assessments are delivered online. Thus, the goal of this project was to design a study that compared the use of low stakes assessments using recognition versus recall and examine the effect these methods had on the student's higher stakes assessment scores (i.e., quizzes and exams) and retention.

METHODS

Participants were freshmen and sophomore undergraduates in a 200-level Kinesiology hybrid course. Participants were expected to watch weekly lecture videos and answer low stakes questions (multiple choice or free response) embedded into the videos. Participants were placed into either the recall (free response) group ($n = 140$) or the recognition (multiple choice) ($n = 111$) group. The videos were identical in content, except for the low stakes questions throughout the lecture video. The low stakes questions were not required to be completed by the participants nor were the responses graded.

Independent t-tests were used to compare average student participation in the low stakes questions and student's performance on weekly high stakes assessments. Retention was evaluated by comparing final exam percentage using an independent t-test. Level of significance was set at $p < 0.05$.

RESULTS

A statistically significant difference was found in the average weekly participation in the low stakes questions ($p <.001$). The recognition group answered 49% of the weekly questions as compared to only 34.6% in the recall group. There were no other significant differences found. See Table 1.

Table 1. Average Weekly Quiz Participation Quiz Score, and Final Exam Score

	Recognition ($n = 111$)	Recall ($n = 140$)	p-value
	M ± SEM	M ± SEM	
Weekly Quiz Participation (%)			
	49.0 ± 4.0	34.6 ± 4.0	<.001*
Quiz Score (%)			
	83.6 ± 2.0	82.6 ± 2.0	0.63
Final Exam Score (%)			
	87.9 ± 1.03	87.1 ± 1.4	0.79

Note: p-value from independent t-test; *p-value significance < 0.05

DISCUSSION

We found no significant difference in learning or retention between the different types of low stakes assessment used. There was a statistically significant difference in student's participation in the recognition questions compared to the recall questions. We postulate that students were more likely to answer the recognition questions due to the simplicity of clicking on the answer versus having to type in the answer. In addition, the high stakes weekly assessments were multiple choice questions which may have encouraged students to participate due to the similarity of questioning.

One limitation of the current study was the inability to required participants to answer the low stakes questions. As shown in the results, the participation between both groups was low, $< 50\%$. Greater participation may have changed the results of the study. Future studies may benefit from requiring students to answers all questions.

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