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10 Timing of Quizzes during Learning: Effects on Motivation and Retention  
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## Abstract

This experiment investigates how the timing of quizzes given during study impacts retention of studied material. We examine motivational effects, in particular the hypothesis that interspersing quizzes among study blocks increases student engagement, thus improving learning. Participants learned 8 facts about each of 8 plant categories, with the categories blocked during learning. Quizzes about 4 of the 8 facts from each category occurred either immediately after studying the facts for that category (standard) or after studying the facts from all 8 categories (postponed). Subsequent tests, given immediately and several days later, included both the facts quizzed initially and the facts not quizzed. Test performance was better in the standard than in the postponed condition, especially for categories learned later in the sequence. This result held even for the facts not quizzed during learning, suggesting that the advantage cannot be due to any direct testing effects. Instead the results support the hypothesis that interspersed quizzes can serve as a cognitive antidote to boredom and imply that interrupting learning with quiz questions is desirable because it can enhance learner engagement. These findings have practical implications for the classroom, especially because of the increasing prevalence of frequent and rapid quizzing using clickers.