Getting students to AskUp

Medical student study habits and the use of learner-generated questions

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Introduction

Although lectures are the principal mode of teaching in universities and medical schools throughout the world, little learning actually takes place during most lectures (Brown 2014). In addition, the more common study techniques—reviewing lecture notes or re-reading a passage—have low utility (TABLE 1) (Dunlosky 2013). Multiples have shown that we are unable to recognize the strategies that make learning most effective.

“Practice testing,” the technique of generating and answering your own questions or taking practice tests, has been shown to be an effective way to study. One of the reasons for the utility of this technique is that it employs “retrieval practice,” the act of retrieving information from memory, which greatly enhances learning (Angelo 2008, Kapic).

Learner-generated questions have been tested in a variety of settings and have been found to improve reading comprehension, as compared to re-reading a passage (Rosenshie 1996, Weinstein 2010). Learner-generated questions have also been shown to improve lecture comprehension, as compared to answering lecture materials, and sharing these questions with classmates provides further benefit to students (King 1992). It is unknown whether this technique is used in undergraduate medical education.

This pilot study seeks to analyze the study strategies that medical students use to study for class exams. To encourage and analyze question-generation by students, we developed AskUp, an open-source application that allows learners to generate their own question and answer sets. Questions were shared anonymously with other students, giving them an opportunity to answer open-ended questions that peers have created. We aimed to evaluate a short intervention to improve study skills by encouraging practice testing, especially through question generation, and distributive practice.

Methods

HMS students enrolled in the Integrated Human Physiology class were invited to participate. Electronic applications to assess exam study methods were sent to students after each of their three examinations. Study methods were mapped to Dunlosky’s evaluation of effective study techniques. After the first and second examination, we gave a 2-minute presentation about evidence-based study strategies, focusing on distributed practice and practice testing, and highlighted AskUp as one way to employ question-generation.

When students logged into AskUp, they were invited to generate an open-ended question and answer set. We provided students with a list of question stems that elicited higher levels of Bloom’s taxonomy (King 1992). It is unknown whether learner-generated questions improve lecture comprehension even when students were not generating questions, suggesting that an intervention that teaches students to create their own question and answer sets may encourage better use of this technique. Prior studies have shown that learning how to ask questions can improve lecture comprehension even when students were not generating questions, suggesting that this technique improved how students processed lecture material (King 1991).

One of the main findings of this study was that most students were hesitant to change their study habits. Previous studies have also shown that learning style remains fairly stable throughout medical school (Middle 1969). Students commented that they had not used their own study methods, and did not feel they had a firm grasp on their study techniques. While we wanted students to try their own methods and techniques, it is important to note that students may utilize these techniques, but may not report accurate judicious of study efficacy; for example, they minimally predict that “predictat studying” will be more effective than retrieval practice, even though the opposite is true (King 1991). Interestingly, most students described an interest in learning evidence-based study strategies.

Although our brief intervention did not improve the use of question-generation, there were notable increases in the use of practice testing and concept maps throughout the course. The exact cause of these changes was unknown.

This study has several limitations. First, although study strategies were described in the survey, students may not be able to describe the strategies they employ when studying, and may thus provide inaccurate results. Second, because only a minority of students used AskUp, the analysis of the question generation general cannot be generalized to the entire class. Third, although our survey response rates were robust, they may not be representative of the entire class. Finally, because surveys were anonymous, we were unable to match study techniques with test outcome.

Retrieval practice has been shown to be one of the most powerful methods of learning (Kapic 2011) Learner-generated questions is one approach that seems to be underscored in undergraduate medical education. Our hope is that this study will encourage learners to incorporate strategies to improve their learning outcomes, such as using AskUp to practice testing, and help improve the quality of learning strategies employed by medical students.