Getting students to AskUp: Study strategies in a medical school class

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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 most common studying techniques—reviewing lecture notes or re-reading a passage—have low utility (TABLE 1) (Dunlosky 2013). Multiple studies have shown that we are unable to recognize strategies that make learning most effective.

“Practice testing,” the technique of generating your own questions or taking practice tests, has been shown to be a highly effective way to study. One of the possible benefits of this technique is that it employs “retrieval practice,” the act of retrieving information from memory, which greatly enhances learning (Angelo 2008, Karpicke 2011).

We provided a short intervention that highlighted evidence-based effective study strategies, and introduced AskUp as one way to study applying retrieval practice through the generation and answering of questions. We analyzed whether our intervention was effective in changing study habits.

Methods
HMS students enrolled in the Integrated Human Physiology class were invited to participate. Electronic surveys 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 examinations, we briefly introduced effective study strategies, including “practice testing,” and highlighted AskUp as one way to employ this technique.

When students logged into AskUp, they were invited to generate open-ended question and answer sets. To encourage and analyze question-generation by students, we developed a web application called AskUp, which allows learners to generate their own question and answer sets. Questions are shared anonymously with other students, giving them an opportunity to answer open-ended questions their peers have created.

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Results
26 students registered to use AskUp, most (77%) of them logged in only once. When asked why students did not access or log onto the website, student responses were as follows:

• 48 questions were created by registered students, of which 38 (79%) had answers provided by question-writers. Of the questions created, most questions began with “What” (65%), followed by “Describe” (15%), “What else?” (10%), “What do you mean by...?” (6%), “What do you think...?” (3%), “Explain” (3%), and “What was the difference between...?” (3%).

A minority of students (13%) reported using educational apps to study for their exams, these are listed in TABLE 2.

Students were asked whether they would be interested in learning more about evidence-based study strategies. 47 (45%) said Yes, 47 (45%) said Maybe, and 10 (10%) said No.

Some of the features that students wanted to include in future versions of the app are shown in TABLE 3.

Discussion
Medical students use a variety of study strategies in preparing for their exams. Answering questions or taking practice tests is a popular method, but its equally effective counterpart, creating and answering your own questions, was among the least popular study methods in this medical student group. A brief intervention explaining the benefits of question-generation and introduction of a web app was not effective in changing student study habits.

Students noted that creating their own question and answer sets takes too much time. One prior study also noted that generating question and answers took longer than simply answering questions, yet students reported that when they did answer questions, these, they are more likely to ask higher ordered questions and think more deeply about the concepts being taught.

Students also commented that they had already developed their own way of studying, and were hesitant to change. Previous studies have shown that learning style seem to remain fairly stable throughout medical school (McManus 1996). Unfortunately, prior studies show that students may not be able to accurately identify their own learning style, and do not change their study habits to match their learning style (McManus 1992) (Figure 1).

Prior studies have also indicated that sharing questions (asking and answering classmates questions) provides further benefit for students (King 1992).

Retrieval practice has been shown to be one of the most powerful methods of learning. For example, in a study comparing the efficacy of creating concept maps, an active learning approach that uses elaborate study techniques, with retrieval practice, retrieval practice was shown to be superior (Karpicke 2011).

Future Directions
Future studies should clarify what aspects of generating questions make it more effective, and how to make it easier for students to use this technique. Teaching students to become better at studying, even as medical students, will enable future studies to determine whether teaching students to generate open-ended questions is more effective in medical school and graduate medical education.

References