Evaluation of a Pre-Made Expanding-Retrieval Flashcard Tool and Medical Student Performance on Step 1

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Et al.
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Objectives
1. Are there testing gains in students who used the Maimonidesck versus those who did not, and how do those gains vary with patterns of use?
2. Did users consider the Maimonidesck an effective, efficient method of Step 1 preparation?

Methods
The 125 members of the UMass Class of 2019 were emailed before the start of Step 1 about participating in an online study of their Step 1 preparation. The included a description of Anki and the Maimonidesck and a link to request access. All those who requested access received a Step 1 study deck, instructions for downloading the 500 cards, a study guide for new users, a study index and topic organizer, and a link to a shared website for reporting results.

Baseline Survey
- Administered prior to the start of classes
- Evaluated baseline academic information, demographics, and scores

NBME survey
- Administered “12 weeks into second year, following score reporting of a custom NBME exam covering pathophysiology, cardiovascular, and renal systems organs.
- Evaluated Maimonidesck usage and interaction, online survey conducted up to two months after the exam, and analyzed NBME score.
- “Usage grade” and “Interaction Grade” were given on the table below.
- “Primary grade” was based on a 5-point scale asking if user agreed with the statement, “The Maimonidesck is your primary study tool for preparing previously covered material.” Categories included Primary Tool (Agreed strongly agreed), Secondary Tool (Neutral/Fair), or Reference Tool (Disagreed/Strongly disagreed).

NBME Results (n=44)
- There was no significant difference between MCAT scores of users and non-users, or between the Primary, Usability, or Interaction tool groups. There was no difference in pre-test question bank completion.
- There was a statistically significant difference in test score when comparing High Use vs Moderate + Low Use (p=0.01, power=0.73), as well as High Use vs Moderate vs Low Use (p=0.09, power=0.64)

The average of all 125 UMass test-takers was 74.5 (SD 7.75). The 44 Maimonidesck users averaged 75.0 (SD 6.7), remaining them resulted in a non-user average of 73.6.

Step 1 Results (n=31)
- There was no significant difference between MCAT scores of users and non-users, or between the MCAT score on Step 1 completion by the primary group, Secondary, and Reference tool groups among users.
- The average of all UMass test-takers was 233.2 (SD 21.9). The 31 Maimonidesck users averaged a 240.5 (SD 17.8). Exiting them resulted in a non-user average of 225.3.
- Nearly 100% of respondents agreed or strongly agreed that the Maimonidesck was an effective learning tool, with 76% agreeing or strongly agreeing that it was a time-efficient learning tool. 95% of respondents would recommend the Maimonidesck to a classmate.

Discussion
There has been a proliferation of Step 1 resources, but few address a fundamental difficulty of preparing for the exam: study scheduling. The Maimonidesck—a resource created by two medical students—was designed for broad application to daily workflow, made use of the entire second-year calendar, and appears to be effective in that capacity. The 31 users averaged a 240.5 (SD 17.8) compared to the 229.5 of non-responding UMass students (70% of all test takers).

A second iteration of this study is underway for the Class of 2020 and will seek to address the primary weaknesses of the current project, namely:
- Study Design: We anticipate equal or more increased interest from the 150 students in the Class of 2020
- Improved Control: Obtain Udall and Step 1 data from non-users
- Subgroup Analysis: Evaluate both users and controls for specialty preferences and target score as possible markers for self-selection

For better or worse, the stakes of Step 1 are not decreasing. The value of this exam as a measuring tool for residency qualification, and its effect on medical education in general, is very much up for debate. What is not, however, is its importance to current medical students with specific specialty and geographic preferences. If students are to continue to value this high stakes exam, those resources must be available—one in both content and delivery—to do so in an efficiently and effectively as possible.

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