

9th Annual Medical Education Day

Title: Use of Supplemental Spaced Digital Image Identification Improves Student Performance on Medical Neuroanatomy Digital Practical Exams

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Background: The incorporation of practical-based coursework in student anatomical training represents a challenge in medical education. As technology has developed, so has the push to incorporate digital imaging as a supplemental resource to aid student learning in these courses. This study aims to quantify the relationship between student use of supplemental digital flashcards of gross neuroanatomy structures, delivered in a spaced-repetition model, on student practical performance within the 2022 first-year Medical Neuroscience course at the Brody School of Medicine (BSOM).

Methods: A supplemental flashcard deck was created for a randomly-selected subset of testable structures. Flashcards indicated a neuroanatomical structure for identification and were created using the digital software ANKI, taking advantage of the embedded optional spaced-repetition software. At the end of each unit, students were assessed via a digital practical exam and asked to designate their use of the research deck. Assessment questions were then coded as “associated” or “not associated” with the research deck, followed by comparative analysis via two-tailed two-sample t-tests based on deck usage.

Results: Exam one data was collected for 87 voluntary participants. Data was distributed between learners that used the research deck with spaced repetition (n=36), used without repetition (n=26), and those that did not use the deck (n=25). Of the 36 exam questions, 16 were associated with the research deck (44.4%). For deck-associated questions, there was a significant difference in scores between learners that did not use the deck versus learners that used the deck with repetition (p=0.005), but not those without repetition (p=0.12). Students utilizing the deck with and without repetition had statistically higher scores on deck-associated questions vs non-deck questions (p<0.001, P<0.001). No statistical difference was noted for the group that did not use the deck (p=0.20). Additionally, no statistical differences were observed in overall scores or non-deck question scores between any groups.

Conclusion: While practical examinations can challenge medical learners, preliminary data shows student performance on practical assessments in the BSOM Medical Neuroscience course can be improved with the aid of supplemental spaced digital image identification. Future studies should evaluate the impact of a full-scale supplemental deck on student performance.

**Collection and analysis of exam 2-3 (of 4) data will be completed for inclusion prior to the time of presentation.*