

Innovative Approaches to Cadaveric Learning: Sustainable Near-Peer Mock Practicals

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Problem Statement: Improving cadaveric identification skills in medical students with varied course exposure by implementing sustainable near-peer mock practicals.

Rationale: The rationale for this study emerges from the critical need to enhance anatomical education for medical students, who face significant challenges in mastering anatomy through traditional laboratory-based coursework. Many students begin their medical training with varying levels of anatomical knowledge, and the high-paced and demanding curriculum of medical school often intensifies this disparity. Traditional cadaveric dissection, while invaluable, frequently leaves students feeling overwhelmed due to unfamiliar testing formats and the pressure of practical exams. To address these issues, mock laboratory practicals have been introduced at several institutions. Despite their potential, the effectiveness of these mocks have been inconsistent, largely due to a lack of standardized implementation. This study aims to refine and evaluate a sustainable model of near-peer led mock practicals that reduce the operational burden and improve students' ability to identify anatomical structures.

Methods: The study was conducted over one year at the East Carolina University Brody School of Medicine. It involved 99 first-year medical students participating in the Fall 2023 Gross Anatomy and Embryology cohort. Our project aimed to enhance cadaveric identification skills through the implementation of near-peer created mock practical exams. These mock exams consisted of 50 multiple-choice questions, focusing on both identification and application of anatomical knowledge across four unit exams: back and upper limb, head and neck, thorax and abdomen, and pelvis and lower limb. Questions were designed to mimic the format of faculty-administered practicals and included high-priority structures identified as challenging by near-peer students (second to fourth-year medical students). Participating students were self assigned to two groups for each mock. Data was collected through pre- and post-mock testing administered virtually via Qualtrics. These assessments consisted of 10 multiple-choice questions related to the topic of each mock, designed to measure the effectiveness of the mocks in improving anatomical knowledge. While Group 1 received the same pretest and posttest for each mock, Group 2 received a separate pretest to determine the influence of having seen the question set previously on performance. Analysis of the data involved comparing pre-test and post-test scores using unpaired t-test to evaluate significant changes in student performance.

Results: Participation was high with over 95% of the 99 enrolled students engaging in each of the four mock exams, divided approximately evenly between Group 1 and Group 2. Participation in the pretest and posttest was voluntary and anonymous. Notably, there was a decline in participation from the pretest to posttest in each session with a mean pretest participation of 72.5 to 32.7 posttest. The analysis of pretests and posttests revealed statistically significant improvements in mocks 1,2, and 4. However, Mock 3 did not show statistical significance ($p=0.067$) despite an average improvement of 10.6 points between the pretest and posttest for Group 1. Specifically, Mock 2 displayed a the largest increase of 20.9 points ($p<0.001$) from pretest 1 to posttest 1, underscoring the impact of the mocks on learning outcomes. A comprehensive analysis combining all mocks indicated an average score increase of 16.0

points from pretest to posttest 1 ($p < 0.001$) and 13.0 points from pretest to posttest 2 ($p < 0.001$). This overall trend confirms the mocks' effectiveness in enhancing student performance, with no significant score discrepancies noted between posttests 1 and 2 ($p = 0.55$), even though Group 1 had prior exposure to posttest questions as they mirrored the pretest. A significant score improvement of 14.4 points was also observed between combined pretest 1 and posttest 2 scores ($p < 0.001$), reinforcing the educational value of the mock practicals.

Potential Impact or Lessons Learned: Near-peer created mock practicals can significantly enhance cadaveric identification skills and reduce exam-related anxiety among first-year medical students. Overall, we support the effectiveness of near-peer mock practicals as a sustainable and scalable method to improve anatomical education within the medical curriculum.

References:

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