

The Impact of Student-led Anatomy Mockticals on Performance and Learning in Medical School

Nikita T Lee, Jickssa Gemechu, Stefanie Attardi, and Malli Barremkala.
Oakland University William Beaumont School of Medicine, Rochester Hills, MI



Introduction

The concept of practice lab practical exams (PLPE) has long been known to improve the students' performance in health professions education. However, a novel approach to PLPE was introduced as mockticals (mock practicals; Figure 1) at Oakland University William Beaumont (OUWB) School of Medicine.¹ These mockticals differ from traditional PLPE as they are entirely student-led yet maintain the high-stress test-taking environment of a lab practical exam (LPE). This study aims to investigate the value of these mockticals on learning anatomy in medical school.

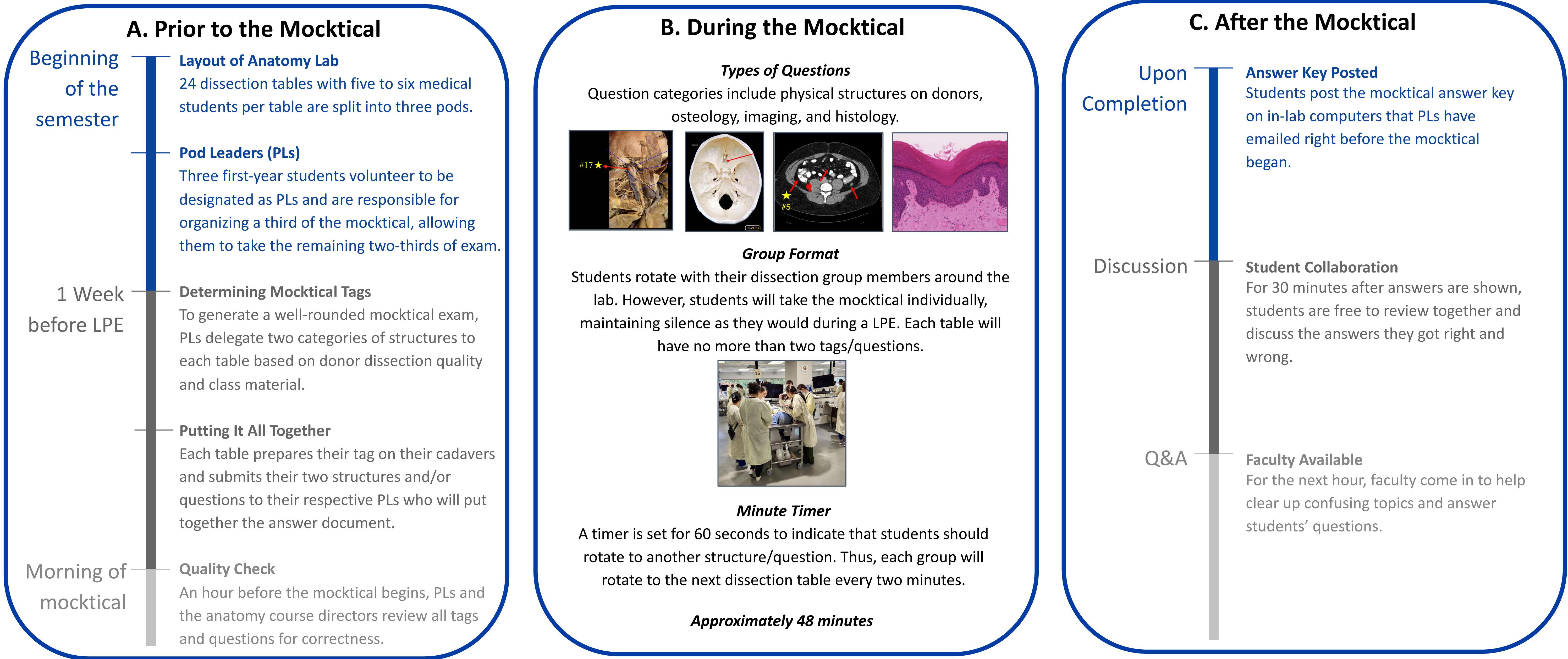


Figure 1. (A) Timeline and description of mocktical preparation. (B) Format of the mocktical. (C) Timeline and description of mocktical debrief.

Background/Why are we doing this?

- Continue to show that practice exams improve confidence through the use of Perceived Preparedness Surveys.² Assess mocktical usage through the use of focus groups.
- Mock exams at other schools have been shown to improve exam performance. Reproduced at OUWB with close to 100% attendance.³
- OUWB mockticals are different as they are led by the M1 class themselves and they include a post-mocktical 30-minute peer review time. "Student-centered" learning effectiveness will be assessed through the use of focus groups.⁴

Specific Aims:

- Determine students' attitude towards anatomy mockticals and find which **aspects students found valuable**
- Measure students' **performance in mockticals vs. perceived preparedness**
- Utilize **1** and **2** to inform the potential benefits of **what sets OUWB mockticals apart** from traditional mockticals

Methods

This IRB-approved study (IRB# IRB-FY2023-61) employed a multi-methods approach. First-year medical students (M1s) had the option to participate in four mockticals on iPads throughout two anatomy courses in their first semester. Each mocktical included an optional Perceived Preparedness Survey², assessing M1s' readiness for upcoming lab exams. iPad usage facilitated data tracking and analysis of mocktical and LPE scores. Recorded Zoom focus groups were conducted to gather qualitative data from both M1s and second-year medical students (M2s) to explore the perceived value of mockticals. The data collection phases and statistical tests are outlined in Figure 2.

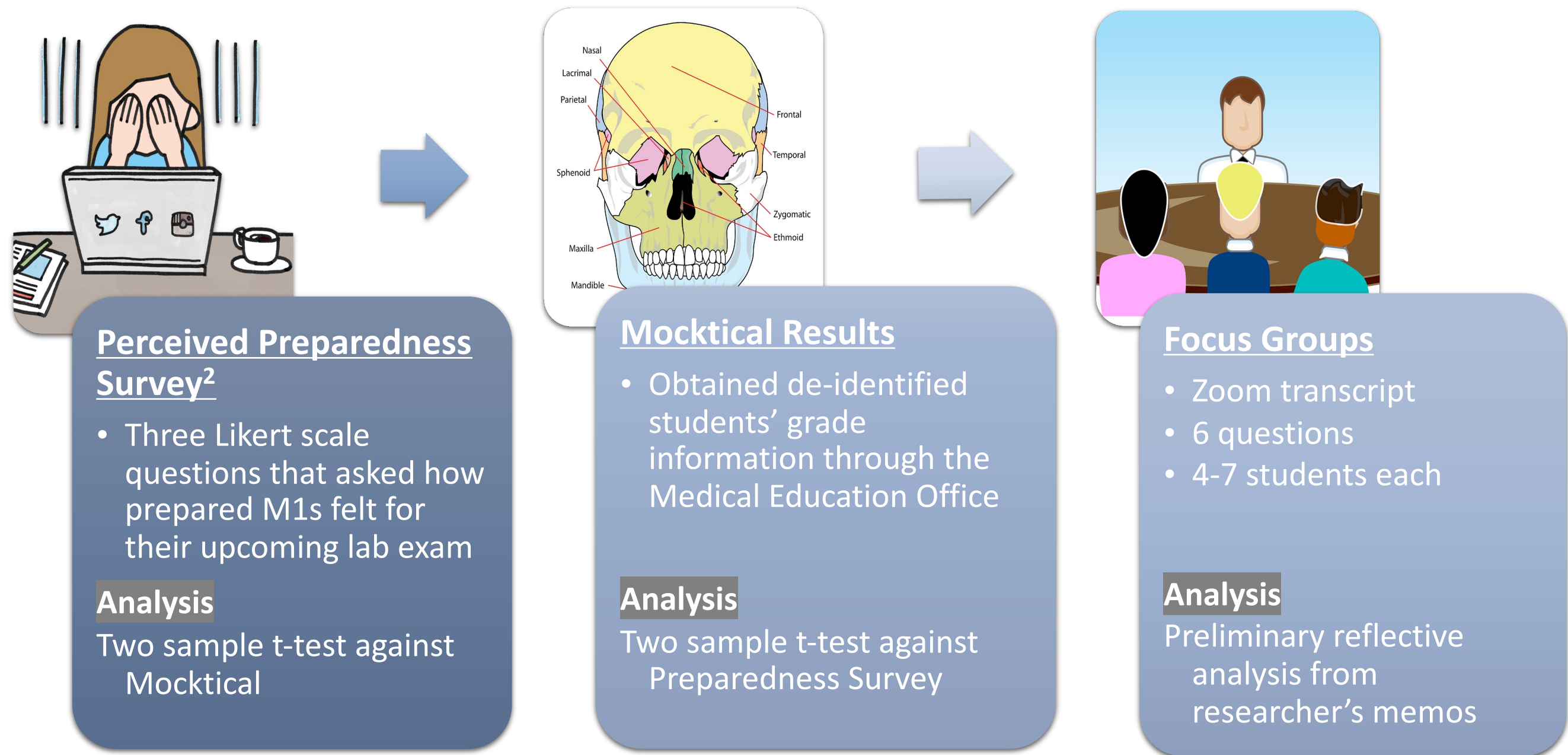


Figure 2. Data collection phases and associated statistical tests/analytic method

Results

Close to full attendance was observed (N=125) at each of four mocktical and 90 students (72%) completed the Mockticals and the Perceived Preparedness Surveys. Two-sample T-tests demonstrated that participants scoring 70-89% on the mocktical exam reported significantly (p<0.05) more preparedness than those scoring less than 70% (3-question Likert scale means scores of 6.8 vs 4.8; 7.3 vs 5.1 and 6.5 vs 5.0 respectively) Themes generated in researcher's memos from focus groups (n = 4; 21 students total) are presented in Table 1.

	POSITIVE	NEGATIVE
MAJOR	- No-stakes simulated practical exam → knew what to expect and eased test-taking anxiety "Key element" & "Golden opportunity" in their anatomy studying 1-on-1 learning with faculty - Peer teaching and collaboration - Key for passing the practical exam	- Crowding during faculty review increased feelings of anxiety - Incorrect tags or incorrect answer key - Low scores on mockticals was discouraging
MINOR	- Used as a last-minute check of knowledge and addressed gaps in knowledge - Clarified misconceptions on how structures could be tagged	- Skewed towards more difficult tags → increased feelings of anxiety - Felt like it was mandatory because everyone went (FOMO)

Table 1. Categorization of themes from researcher's memos according to frequency (major/minor) and attribute (positive/negative)

Conclusions

Quantitative Analysis

Preliminary analysis indicates a positive correlation between perceived preparedness and higher mocktical scores. Ongoing investigation is underway to explore the correlation between mocktical scores and practical exam performance.

Qualitative Analysis

Preliminary qualitative analysis revealed that many students found mockticals to be a helpful study tool, with some considering it crucial for passing the LPE. Students primarily used mockticals as a last-minute review of anatomical knowledge before the LPE. While the mockticals reduced test-taking anxiety by providing a preview of the actual exam, post-mocktical concerns such as low scores and increased anxiety were observed. Overall, the initial findings were mostly positive, but a more comprehensive thematic analysis using NVIVO software will explore the value of mockticals through focus group discussions..

Challenges

A challenge observed was decreased responses on Perceived Preparedness Surveys and mockticals during the fourth session due to a preference for pen and paper over iPads for ease-of-use, which affected attendance accuracy. Focus group recruitment was average, but data saturation was achieved as redundant themes emerged in the last focus group.

Future Directions

Potential future studies for this research include reproduction at other Health Professional Schools.

Acknowledgements

The authors are grateful to the people who donated their bodies to medical education, without whom our anatomy curriculum and this study would not be possible. The authors thank the students who participated in the study.

References

- Kruse A, Huetteman H, Harvey R, Gemechu J, Barremkala M. Mockticals: Student-directed anatomy mock practical exams in a cadaver laboratory. The FASEB Journal. 2020;34(S1):1-1. doi:10.1096/fasebj.2020.34.s1.02505
- Khatskevich K, Hewitt ST, Jang C-W, et al. Benefits of implementing student-led review and mock examinations in the medical undergraduate Gross Anatomy Curriculum. Medical Teacher. 2022;1-4. doi:10.1080/0142159x.2022.2049733
- Reuter P. Low-stakes vs. no-stakes practice exams in anatomy and physiology classes: Which One works better? HAPS Educator. 2020;24(2):21-26. doi:10.21692/haps.2020.010
- Fu X, Wu X, Liu D, et al. Practice and exploration of the "student-centered" multielement fusion teaching mode in human anatomy. Surgical and Radiologic Anatomy. 2022;44(1):15-23. doi:10.1007/s00276-021-02866-8

