

Integration of Hands on Training and 3D Visual Aids into the AMS Anatomy Curriculum

Ryan Desrochers; Kristina Monteiro, PhD; Dale Ritter, PhD
Warren Alpert Medical School at Brown University

Background

In previous years, the anatomy curriculum has relied on an iBook to lay out the procedure for each lab and describe the location of important structures while circulating TAs and instructors facilitate identification and teach dissection techniques. While this system has been effective in teaching anatomy, two areas of improvement were identified:

- There are only 2-3 TAs for every ten lab groups, making it difficult to get one-on-one instruction and learn essential dissection techniques in earlier lab periods.
- The iBook consists of text and static images, but is attempting to describe complicated 3D structures, making it hard to visualize how things interact in the body.

This project attempts to address these areas of improvement through the use of second year instruction on dissection technique during the first lab period, and supplementation of the iBook with interactive 3D models designed to highlight the locations of important structures. The goals of this project are also two fold:

- The main goal is to increase competency in dissection technique earlier in the year, easing the learning curve and facilitating understanding of the content during earlier lab periods.
- A secondary goal is to evaluate the effectiveness of the interactive 3D models, for both use in the lab space and as a study resource, to identify areas of improvement and additional applications within the curriculum.

Methods

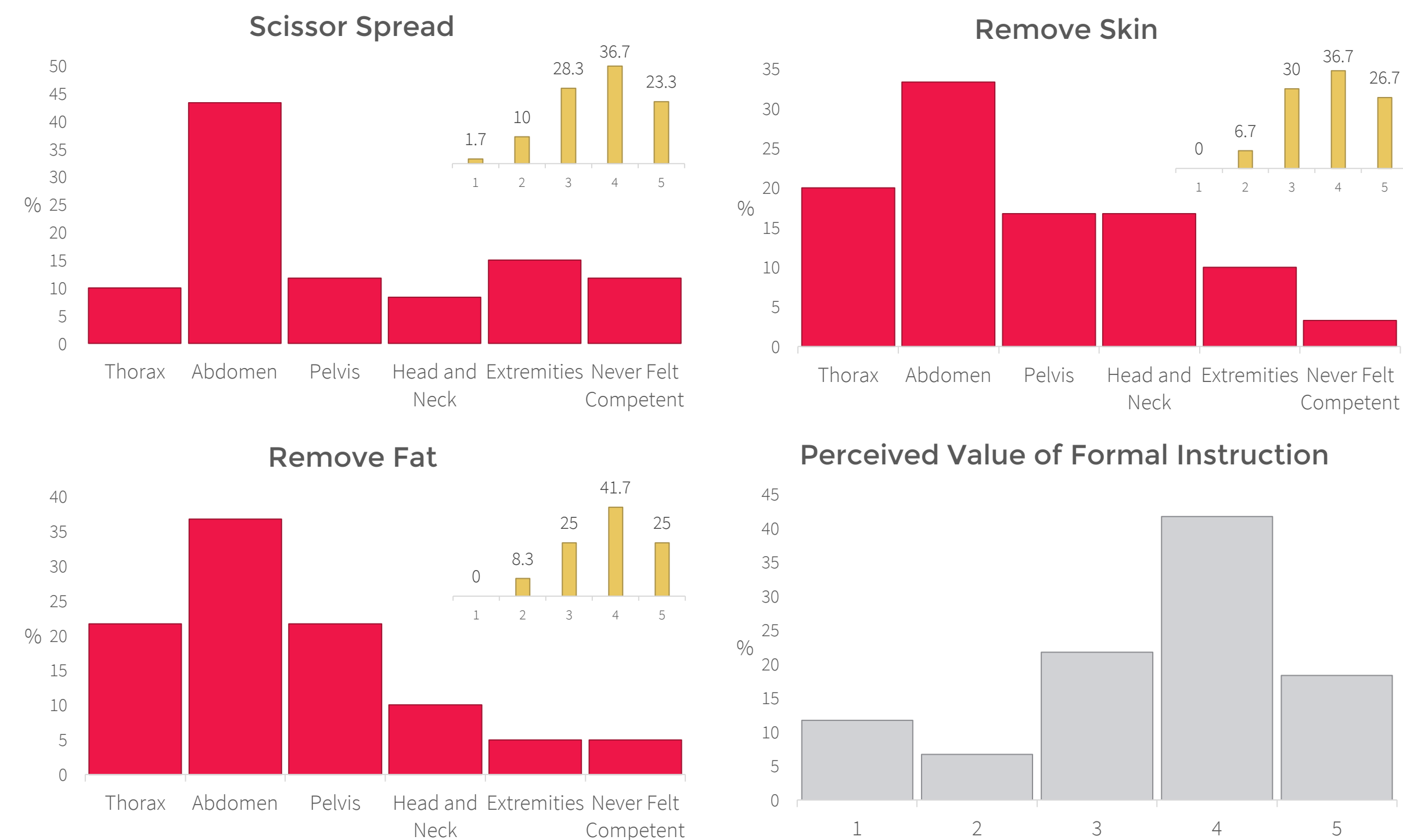
Scissor spreading, skin removal, and fat removal were identified as three essential dissection techniques based on frequency of use and level of precision needed for correct implementation. Surgical and dissection literature was compiled to create a small manual on these three techniques, which was then distributed to second year facilitators and first year students. One second year was present per lab group (4-5 students) during the first lab period to demonstrate each technique, allow supervised practice, and give feedback for each student. Retrospective survey data from MD’20 on their perceived competence in these techniques was used as a control. Identical survey questions will be distributed to MD’21 at the end of the year to assess for a shift in onset of competency and impact of second year instruction.

The 3D modeling software used was Complete Anatomy by 3D4 Medical. The software was used to create succinct diagrams that highlighted high yield structures for each lab period as well as a cumulative review quiz for the end of each block. The software, along with these resources, was installed on each iPad in the lab space so that it could be used alongside the iBook during dissections. These materials were also made available to students on personal devices for studying purposes outside of the lab. Analysis of the effectiveness of these resources will be largely qualitative, polling first year students on its effectiveness and suggested areas of improvement.

Results

MD’20 Retrospective Data (n = 60)

- During which block did you first feel competent in your ability to [red box]?
- On a scale of 1-5, how confident are you now, at the end of the year, in your ability to [yellow box]?
- How much would formal instruction in these skills have enhanced your understanding of the content?



“I really think that more instruction on how to dissect would have helped immensely.”

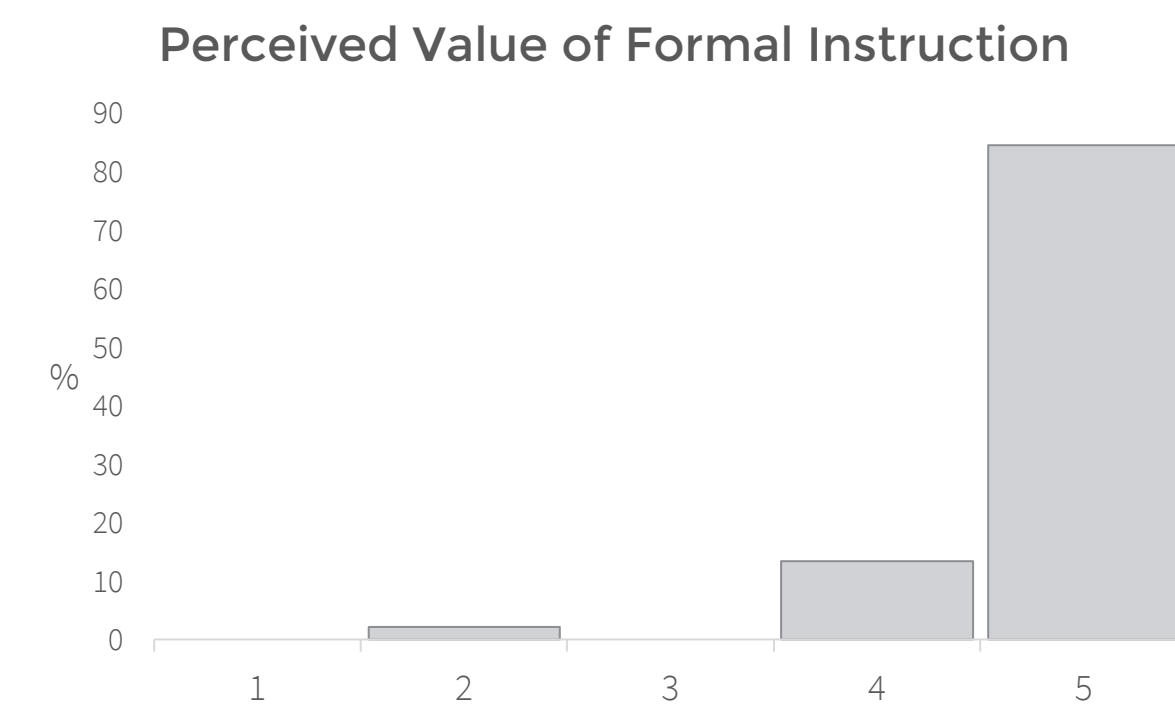
“I got nothing out of doing dissections. I could have learned everything more efficiently with prosection and Complete Anatomy.”

“You can still learn without the right skills, but anatomy lab goes much smoother, faster, and is more enjoyable with good dissection skills.”

“I think part of the learning processing is actually doing it yourself and getting a feel of various structures and the anatomy dissection techniques as you go.”

MD’21 Prospective Data (n = 45)

- At this point, on a scale of 1-5, how valuable do you feel second year instruction was on your first day in lab?



Prospective MD’21 data shows a much higher perceived value of formal instruction than retrospective data from MD’20. End of the year competence data from MD’21 will hopefully show an equitable left shift based on this perceived value when compared to MD’20.

Future Directions

Future directions will be based on the MD’21 competence data to be obtained at the end of the year. The curriculum could be adjusted to include or exclude specific skills, or simply refined to increase its effectiveness. Some questions that still need to be addressed are:

- Assuming this training is effective in decreasing time to achieve competence and increasing overall confidence in dissection skills, how much does this competency impact learning?
- If there is little impact on learning, are there other factors such as increased confidence in the lab space that warrant its inclusion in the curriculum?

With regards to the Complete Anatomy integration, recommendations from MD’21 students will guide its further development and use within the anatomy curriculum. Possible options include:

- More comprehensive diagrams and quizzes.
- Interactive lectures or content reviews.
- Replacement of cluttered iBook diagrams with simplified ones designed in Complete Anatomy.

Funding: Brown Summer Assistantship for a Scholarly Concentration in Medical Education