**Appendix 1: Student Questionnaire:**

Dear students,

As you know, the latest practical anatomy course was transformed to online learning following the Israeli ministry of health instructions due to the Corona virus outbreak.

The purpose of the following questionnaire is to evaluate the quality and effectiveness of practical teaching that was given online in the latest practical anatomy course. Your answers will help us improve the following courses and we’ll appreciate any remark.

**Filling the questionnaire takes a few minutes, it will serve your colleagues in further years. The questionnaire is completely anonymous, and have no effect upon your grade**

Please rate the level you identify with the following sentences from 1 to 5, 5 being the highest. Answer the following question with reference to the late practical anatomy course (limbs):

|  |  |
| --- | --- |
| Question | Mark (1-5) |
| What is your overall satisfaction with the practical course? |  |
| How clear were the explanations? |  |
| What is the extent that the practical course had helped you in understanding the theoretical material? |  |
| What was the contribution of practical teaching beyond the theoretical lectures? |  |
| How well did this teaching method prepared you for the test? |  |
| Rate your level of understanding the material of the practical course |  |
| To what extent do you think this learning method of the practical course will help you remember the material in the long-term? |  |
| To what extent was the test compatible with the material taught in the course |  |
| Did you watch the recording of the virtual dissection after the live zoon session? 1. Yes 2. No |  |

In your opinion, are there any additional benefits or added value to the online method?

In your opinion, are there any other disadvantages to the online teaching method?

Now please answer the same questions however please do so **with reference to the practical course in the three previous anatomy courses** (thorax, abdomen & pelvis, head & neck), that used the conventional method of cadaver’s discussions:

|  |  |
| --- | --- |
| Question | Mark (1-5) |
| What is your overall satisfaction with the practical course? |  |
| How clear were the explanations? |  |
| What is the extent that the practical course had helped you in understanding the theoretical material? |  |
| What was the contribution of practical teaching beyond the theoretical lectures? |  |
| How well did this teaching method prepared you for the test? |  |
| Rate your level of understanding the material of the practical course |  |
| To what extent do you think this learning method of the practical course will help you remember the material in the long-term? |  |
| **Hereby some comparison questions between the methods, please briefly explain your choice in each section:**  In what methods did you feel more concentrated during the dissection/virtual dissection? 1. Conventional teaching with dissection cadavers 2. Online please elaborate why:  In what method did you feel that the time was exploited more efficiently?  1. Conventional teaching with dissection cadavers 2. Online please elaborate why:  In what method do you think the anatomical structures appeared clearer?  1. Conventional teaching with dissection cadavers 2. Online please elaborate why:  In what method did you feel you had a better understanding of the 3D structure?  1. Conventional teaching with dissection cadavers 2. Online please elaborate why:  If you had another practical anatomy system and you could choose one of the two options (there are no limitations) which one would you prefer- (please circle the best answer)-  1. Conventional teaching with dissection cadavers 2. Online  please elaborate why: | |

Do you think such a method could be integrated into future courses? If so, how do you think it can be combined

Other remarks you want to address?

**Appendix 2: Student Responses:**

**In your opinion, are there any additional benefits or added value to the online method?**

Aside from being able to do it anywhere, at anytime, not really. Being able to re-watch the lab is a benefit, but not too practical with time restraints (personally anyhow), and not much different from going over the material alone.

Yes! much better to have easy access to each dissection with all body parts clearly labelled.

I loved the powerpoints and recordings which provided a way for me to annotate and have a way to remember what is where. I think the live dissections and this method had different strengths; you could physically see where different structures were on the cadavers as opposed to 2D but for recall purposes, the only way we could remember what was where was by hearing it once and then trying to remember it visually. On the plus side, with the visual material and recordings in this unit, I feel it was a better method to help me consolidate my learning. Also, the cadavers we used this year were not always well preserved and it was not always easy to discern which structure was where versus a perfectly preserved cadaver as seen in references like Ronen. Ideally some combo of both methods could be used for the future.

No, I much prefer the in person anatomy course, but this worked nicely during COVID.

It’s easier to access the material learnt since everything is recorded. A lot of time is wasted in the dissection lab trying to recall everything and not being sure if we are identifying the parts correctly.

I liked that we had access to recorded dissections which we could view and review at our own time and the Rohan pictures were super helpful. That was a great resource that could be used in addition to the cadavers as this enables people to study without going into the lab every time. In particular, Uri's lab was the most helpful as it was detailed and very organized.

The online class allowed us to review lectures and dissections later on our own time. Several images and videos may be used. The quality of each dissection got better each time.

I really liked the course, thought it was very well organized. Some images were difficult to decipher, in the future I would recommend suggesting a range of Rohen images to study from. Otherwise, was great. Thank you.

According to my humble opinion, there is no substitution to the practical labs meetings. However more radiology should be included in the future and this could definitely be done online.

Having the theory portion online was very helpful because you could stop, rewind and replay. But I do not think there was any added benefit for the lab online.

I think there should be a list of Rohen plates like the list of Netter plates and the online dissection should be focused on those plates and really talking through the positions of all the structures. The lectures seem to harp on the same few structures and went on for too long.

Re watching

It’s nice to go back to recordings. I said in my previous answer i didn’t watch the recording after but I did go back to confirm some facts I wrote down.

The PowerPoints that TAs created to guide the online dissections and then subsequently released to us online were incredibly helpful! I know a lot of effort went into creating these PowerPoints, and I'm really thankful for them.

The main benefit to online learning is that you can repeatedly watch the lecture recordings after the initial session to drill in the material.

Only that it was recorded

It’s helpful to being able to go back and view the recording again

**In your opinion, are there any other disadvantages to the online teaching method?**

Although it was obvious that the TAs worked hard at preparing the lessons, “lab” portions provided little in comparison to simply reading and memorizing the structures out of an atlas and textbook.

It was a lot harder to visualize and understand the limb movements without being able to use the cadaver

My spatial intelligence is very low - I have a very hard time seeing 3D structures in my head when I can't see them physically. It was harder to figure out complex shapes like the pelvis, and also to figure out how all of the muscles etc fit in the different layers etc. I found it really difficult to learn this limb unit without getting to see cadavers. Anatomy is a lot more clear with cadavers in the lab but the material was still adequately taught over zoom

Anatomy is a lot more clear with cadavers in the lab but the material was still adequately taught over zoom

It’s difficult to understand the relation of structures when not really seeing them. Sometimes there were connections/ internet issues that made it difficult to learn

Some TAs relied on dissection videos that kept failing, along with their own internet.

No cadaver, limited motivation, hard to learn from a book like that. Need some sort of software

The main disadvantage with doing cadaver lab online is that it's difficult to conceptualize the 3D image of the structures and the overall bigger picture of the structures. On the exam there were some images where it wasn't necessarily clear of what the plane of view was.

Not being able to get the full 3D experience of anatomy. Nothing beats the lab.

It was a little more difficult to grasp the structures and their names due to not being able to vividly see the cadaver. Possibly having a more interactive online dissection would allow for increased understanding of terms.

Please see above. Also the fact that while all attempts to show live dissection videos were very well-intentioned, the internet speeds in Beersheba don't easily support zoom video streaming and not without additional power outage problems. I also do believe that the Wisconsin and anatomy guy dissections did relate the structures and function to each other better than what some TAs were able to provide. Some of the TA work, while again, very well-intentioned, seemed to ask for a very random recall of structures. Given the unit of limbs, compartments and their associated actions are super tied to each other. I wish that were emphasized more.

Also, I spent an inordinate amount of time going through the dissection videos on my own and annotating all the relevant structures through screen capture and adding TA notes afterwards. This was very helpful for the practical exam, but the amount of work involved in doing so made it very overwhelming for me. Maybe everyone else can look at a video once and just remember everything but that's not how I work. That said, I appreciate the ability to annotate cadaver structures so I can review them; that's something we couldn't do in the cadaver lab. All in all, thank you for trying quite a few approaches to attempt to make this work.

It was really hard for me to orient myself without actually learning from a cadaver

Of course it's hard to teach and learn anatomy from a screen. It was hard to visualize things sometimes and I think some things were harder to learn because we couldn't see them in an actual cadaver. But overall, gives the situation, I think the teaching was very quickly adapted and the TAs did a great job of still teaching us the material.

You lose the ability to touch things and have a more three dimensional continuous body to study rather than 2 dimensional pictures of a part of it.

Had to conceptualize 3D objects

I think we were unable to learn the anatomy as well as we would have had we had the option to work with the cadaver, time to practice on the cadaver on our own and see in person structures. I think seeing the cadaver and structures in real life lead to long term memory of structures where I feel I will not have this for limbs.

Yes. X10 more challenging to Contextualize and remember information from pictures and video. Very challenging to look through different photos and remember the associations. I really like anatomy but found this way very challenging - however totally understandable given the circumstances. There is value in making the recordings available - as rewatchng is likely helpful to future students in addition to the live dissections. Thanks to all the Ta’s you guys are amazing!

Yes, I wasn't able to get as great a grasp on the orientation of structures and how they lie in the body. The in person practical part was much better at helping me get a good understanding of the structures.

I still immensely appreciate being in the dissection room and being taught by the TAs using the physical cadavers that are donated to the school. The exposure is incredibly important and I feel it is indispensable for an optimal spatial/3D understanding of human anatomy.**Do you think such a method could be integrated into future courses? If so, how do you think it can be combined**

Maybe have online recordings of review material so when people go into lab all they do is jump straight into the dissection instead of spending 30-60 minutes reviewing anatomy book with the TAs

It's not ideal. I believe the dissections are extremely interesting and an amazing experience. Having the body in front of me really makes me appreciate not only the course but the importance of what we're doing and what we're trying to achieve.

I think it could be integrated. It definitely can save time if the courses are performed efficiently with high quality material. I think dissections online could be a could resource, but it would still be nice to at least see the structures once at the end of the unit. One idea is that instead of having 3 or 4 cadavers we would just need one or two and that at the end of the unit we could still go in and see a predissected cadaver to solidify the material after having attended online practical dissections.

It should be combined with conventional labs as well. But as I said earlier radiology could be taught virtually after laying down the foundations with conventional labs

yes. It can be added to existing courses to provide extra practice time with clear instructions

I think this could be implemented for theory but I have gained an in dept understanding and long lasting understanding from the labs, which I do not feel I got from the virtual course.

Only if there is a software component that allows you to “touch” a cadaver. I know some med schools do this anyway for anatomy

Use Rohan pictures if possible. I think it would help to have a picture reference for some of the things as they aren't always so clear in the cadaver. And also, there are usually things that we can't see in the cadavers so it's nice to have a place to go and see what things are supposed to look like.

Yes, please see prior comments

Do you mean in times of pandemics? if so perhaps a TA being in the lab with cameras.. like the online videos but doing it specifically for what we need, with netters etc used as well, just as in the real practical labs.

Answered this previously

I think that online learning can be integrated into the anatomy course. For example, during the cadaver labs, the T.A.s always walk us through the Netter images before going to the physical cadaver. Since we are already expected to review/be familiar with the material before coming to lab, I think it would be more efficient to either have video lectures going over the Netter images or simply just cover the physical cadaver portion during lab.

Online teaching is definitely adequate for theoretical anatomy but not so much for practical anatomy

I suppose it could. I’m not certain exactly how.

i think some of the abdomen labs could be virtual, and maybe add virtual bone labs bc they are usually left for self study

Theory should be online but the practical should be in person