

How to Dissect a Cat: A Video Tutorial

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Introduction

Comparative Anatomy (Zoo 201) is a major's level course that many Zoology majors and non-Zoology pre-health students take before they graduate. It is a particularly challenging and time consuming course for students because of its extensive dissection component. The dissection component of the course is frustrating to many students because they are unfamiliar with the proper detail-oriented dissection techniques. This is especially true when the students work to dissect a complicated organism like the cat.

One source of this frustration is that it is very difficult to understand how to perform a certain procedure of the dissection without a diagram or other visual aid. In addition, students often find the written instructions vague and hard to follow. Furthermore, it is tricky to locate the structures from the diagrams that are present because the diagrams are 2D and the organisms are 3D. While Teaching Assistants and Undergraduate Assistants are helpful, students still spend considerable time waiting to receive answers to questions or for clarification on the dissection instructions, especially as there are only two Assistants and up to 25 students in a class. In addition, students need to ask many clarification questions because there is only one organism per group. As a result, the students cannot risk moving forward with the dissection without asking questions, since if the organism is damaged with an incorrect dissection the damage is permanent.

Through my own experience with the class I can recall the frustration of the uncertainty that followed almost every procedure that was done. I have personally experienced the complexities of the laboratory portion of Zoo 201, which led me to design my honors thesis project to help students with a visual dissection aid to supplement the laboratory manual. I decided to create a video tutorial of the cat dissection to aid the students in this course. I feel the

video will help students save time, provide clarification of the difficult instructions, supply them with visual examples of dissection techniques, and serve as a study tool for exams.

Getting Started and Creating Pilot Videos

I started the project by talking with Mr. Robert Balfour, the Comparative Anatomy instructor, about getting access to materials as well as the lab. Mr. Balfour gave me access to multiple cat specimens as well as the comparative anatomy lab and tools to begin working. Additionally, because I was an Undergraduate Assistant for the laboratory, I also had access to all of my students' specimens, an advantage that proved helpful when certain structures were difficult to locate in my own. I felt confident with the dissecting aspects of the course due to the fact I had taken the course the previous year. However, I had no video filming or editing experience prior to this project. For this reason, my plans had to be very fluid as I had no basis on which to create accurate timelines.

I began dissecting in mid September of 2008. I selected a very long skinny female cat for my main dissection specimen. The reason for choosing a long skinny cat is that the muscles are typically more defined and the vascular system is usually better injected. The first segment of video I recorded was the skinning process. I planned to prepare a polished rough draft of this first dissection segment to be ready for this year's students to view before class. From this segment I would be able to not only get feedback from the students on what they liked or didn't like, but also to get a better idea of the project timeline. I immediately discovered how greatly I had underestimated the time requirement and difficulty of this project. Without having to film, I can usually skin a cat in under an hour. With filming, it took me 7.5 hours to skin the cat. I had been expecting it to take me twice as long to skin that cat while I was filming, but seven times as long was a real shock.

There were multiple reasons why it took me so much longer to film, but the two main reasons were camera positioning and simply operating the camera. The simple operation of the camera was the most unexpected filming issue. I didn't have any problems with the operation of the video camera, but I had problems with being able to touch the camera. As one can imagine, dissecting a cat can be a pretty messy ordeal, usually resulting in dirty gloves. Each time I wanted to stop the camera, zoom in or out, change the angle, or move the whole tripod, I had to take off a glove. This might not seem very time consuming, but an hour's worth of filming would require me to take off a glove at least 20 times. As I continued with the filming, I began to figure out ways to manipulate the camera without taking off my gloves as much. One trick was to cover the tripod handle with a rubber glove so that I could change the camera angle without removing my gloves. At the end of the day I would simply pull the glove off of the handle and dispose of it. Additionally, in order to hit the stop button and control the zoom, I kept a clean blunt probe that served as a clean extension of my hand. By utilizing both of these methods I was able to decrease the time of the filming process.

The biggest obstacle I encountered that led to extended filming time was positioning the video camera. The video camera I used was a Sony Handycam DCR-SR45. This is a very light weight camera that I was able to mount onto a photography tripod. The stationary mount was necessary because I had to do all the filming myself, in addition to the dissecting. The tripod also decreased the amount of camera shake and blurring.

However, filming with a tripod created problems with camera angles. One reason for difficulty with camera angles was the size and shape of the tripod. To begin with, all three legs of the tripod had to be on a stable surface, thus making straight down shots nearly impossible. The tripod legs would have to straddle the cat without causing a shadow or getting in my way while I

dissected. Another problem with the shooting set up was that in its most compact setting, the tripod was still about 16 inches tall. This was great for shooting in a downward angled manner, but prevented me from being able to record video with a direct side view. To remedy the situation, I tried to adjust the height of the tripod in order to place it on the floor instead of on the table. However, because a tripod's legs get wider as you extend them, the video camera actually got further away from the cat than it was when it was on the table. Another shooting issue caused by the tripod is its width. An ideal camera angle would be the angle my eyes had while I was working. However, the camera and tripod are too big and wide to place on the table in between myself and the cat.

Due to the aforementioned limitations of filming with a tripod, I was forced to use three main camera angles or techniques to obtain a proper shot. The first technique was to place the camera on the opposite side of the table where I was working. This required me to have to work on the portion of the cat that was farthest away from me and in many cases with an upside down view of how I would normally do a procedure. Another issue with this technique which I discovered when I was editing was blocking the shot. I often wear hats to lab and in some cases the bill went right in front of the lens and completely blocked the view.

The second technique was to place the camera on the table at an angle perpendicular to where I was working. The camera had to be to the left of the organism because I am right hand dominant and the shot would be blocked if it was on the right side. This worked well but required me to be very conscious of my left hand during filming. I had to make sure that it was not blocking the shot, which in many cases forced my hands into awkward positions.

The third shooting technique I utilized was an over the shoulder angle. I placed the tripod on a small movable cart that was slightly higher than the table. I could then place the camera

right behind me so it was looking down at the cat right over my shoulder. This angle was better for keeping my hands from blocking the shot, but it prevented me from being able to see what was being recorded. With this method I was not able to see when the camera was not focused on the desired area. All three angles had their pros and cons and by using a combination of the three, I was able to get the necessary footage for my project.

Another learning experience I had was dealing with editing the first segment of video. I initially figured the easiest way to produce the video would be to essentially record all of the dissecting and then to just edit it down later. I failed to realize that before you are able to edit a video on the computer you must import the entire video at real time. This means that if I take 7 hours worth of video it will take 7 hours to import that video before I can begin editing. After the video from the skinning segment was imported, it took around 10 hours to cut down to a 15 minute segment. For this process I used the split video clip feature of iMovie HD in order to cut the segments and move them around to where I wanted them. After the video was cropped down to size, I went through and wrote the script as I watched. It took around two hours to write the script. From this point, I used the CIM (Center for Information Management) lab to record the audio using the Audacity Program.

In order to correctly dub the audio over the video, I had to record every few sentences separately in order to ensure that they were placed in the correct spot. This process took around two hours. Once the audio was in place, I exported the Audacity files and imported them into iMovie HD. Once the audio files were imported, I had to extract the audio out of the video. It took a few minutes to do, but after it was done it was as if the video was captured in a sound proof room. I now had a video which had been cut down and spliced together, along with one long audio segment which did not match the video. I then split up the clips into one sentence

segments and moved them around to match the video. In a few instances I had to either speed up or slow down the video to match the audio. After the audio was matched to the video, I had to export the movie to QuickTime in order to merge the new audio with the video. I exported the movie at full quality. Now that I had the skinning video in a movie format, I was able to export it into iDVD. From here I was able to burn a DVD quality version of the skinning video for Mr. Balfour to critique. However, because I wanted the students to be able to view the video from the convenience of their own home, and I did not have the time or money to burn 80 DVDs, I had to figure out another way to get the video to the students. I decided to utilize the Blackboard website to have the students watch the movies. I exported the movie out of iMovie HD to QuickTime again, this time at web site quality.

This final project left a lot to be desired. Having to compress the video into such a small file really cut down on the quality. It required that the students watch the video in a window one fifth the size of their computer screen. However, it was the best I could do at this point and it was still going to be of benefit for the students who watched it. I provided Mr. Balfour with the compressed video file, and he successfully uploaded it to Blackboard around one week before the students skinned their cats. In the end, this first segment ended up taking somewhere between 30-35 hours to complete from start to finish.

I will talk about the results of the survey later on in this paper because I did not have the data from the survey until the end of the semester. At this point in time, I only had personal observations from the class for which I was an Undergraduate Assistant. There were five groups in my section of the lab, which meant that there were a total of 10 people skinning the cat (two per group). I didn't initially ask which groups had watched the video but I noticed that there were three groups who were working efficiently through the skinning process. They were able to

successfully skin their cat without causing any damage to the underlying muscle. The other two groups didn't fair as well. As I made my rounds from group to group, I found the first group taking part of the superficial chest muscles off with the skin. I helped them recover the muscles the best I could and showed them the same skinning techniques that I covered in the video. By the time I got to the next group, they had already gone into the abdominal cavity, approximately three layers deeper than desired. I again helped this group salvage the muscles the best I could. After I was done, I went around to each group and asked them if they had watched the video. In the two groups that struggled, neither student had watched the skinning video. In the three groups that did a great job skinning, at least one person from these groups had watched the video. This to me was very promising results. I couldn't completely attribute the student's success to watching the video, but I felt that there was at least some correlation between watching the video and dissecting successfully.

Execution of the Main Portion of the Project

As a UA, I was required to be ahead of the students in my dissections so that they could visually see toward what they should be working. After seeing firsthand how long it took to shoot and edit the video for the first segment, I realized that it was going to be all I could do to film my dissections. The editing of the video was going to have to wait until the class was over. This was not an ideal situation for two reasons. The first reason was I would not be able to know whether or not I had the proper footage for my final video. This meant that if a portion of my dissection did not turn out, I would have to dissect a whole new cat in order to get the footage. The second reason why this wasn't ideal was that by the time I would get to the editing, I would probably have forgotten exactly what it was I was trying to capture with each shot. I did my best to address these two concerns. I addressed the first by flipping the LCD screen of the video

camera around so that I could periodically glance up to make sure that the camera was pointed in the correct area. Furthermore, I learned to plan my shots and to be more selective in what I was filming. By being deliberate in what I was filming, I had a better shot of getting the footage that I needed with less unwanted footage. I addressed my second concern by talking my way through the dissections as I did them. This included what regions or structures I was currently working on and other tidbits about which sections were tricky. These audio notes would then help to remind me of what information I wanted included in my film. This ended up working out well because the audio was already going to be extracted for the final copy. This meant that I could say what helped me out without having to worry about having to word it in a way that made sense to the students.

I filmed from September to December. I was in the lab for two hours on both Monday and Wednesday to teach my section of the lab. However, I very rarely had time to film during lab. I always had the video camera with me for the off chance that one of the students had a great example of one of the dissections or structures that needed to be identified. Therefore, I would typically spend two hours either right before or right after my lab section dissecting and filming. This would have never been enough time, so it was very beneficial that I had no class on Friday and the lab was open all day. On Fridays, I would typically arrive at the lab around 8:30am and would film and dissect without any breaks until around 6pm. These were extremely long and tedious days but without them, I would have never been able to finish my project. At the end of the semester, I had over 30 hours worth of footage and had spent over 200 hours in the lab and the CIM library.

My final project was to consist of two main categories of video segments. The first type of segment was the actual process of dissecting. I had already had a trial run on this type of

segment with the skinning video. The second type of segment would be identification of the structures in each section after the dissection was completed. The purpose of these segments was not only to correctly point out the structures, but also to serve as a study tool. In order to properly test the identification segments, I needed to finish a segment before the students were tested on it. At this point in the year, we were already onto the nervous system, a system that doesn't require the cat. The students instead study the sheep brain. I felt that feedback on identification video segments was crucial, so I created an eight-minute film which ran through all the structures in the sheep brain. There was very little dissection to do on the brain so I was able to get the footage uploaded to Blackboard before the students started this section. Due to time constraints, I did not re-record the audio for the video. I filmed the video in such a way that the only editing I had to do was to cut out sections I didn't want, and push the rest together. In addition to the sheep brain, I included footage of the shark brain identification that I recorded the previous year.

Survey Results and Discussion

After the students took their last lab exam on the nervous system, I created an online survey with Mr. Balfour that was sent to the students over Blackboard. The purpose of the survey was to find out whether or not the students watched the trial videos, if they found them helpful, and in what ways they thought the videos could be improved. Overall, I was very pleased with the survey results. Out of around 80 students, 48 completed the survey. While this was lower than I would have preferred, I felt that it was a large enough response to be able to gauge the effectiveness of the videos (See Appendix).

Skinning (Trial for Instructional Dissecting Video Segments)

Out of the students who took the survey, only five did not watch the skinning video. When asked why they didn't watch it, the responses were primarily about not having enough

time to watch the video before class or being unaware that it was available. I then asked the students to respond to how helpful they found the video. There were four options: Very Helpful, Somewhat Helpful, Not Helpful, and Not Applicable because they didn't watch the video. Not including the students who didn't watch the video, 97.7% of the students found the skinning video somewhat or very helpful. The next question regarding the skinning video was: If there were more instructional videos for dissecting the cat, would you use them to help you prepare for the dissections? Just over seventy seven percent of the students said they would use the videos if they were available. In the extended response questions regarding what ways the skinning video could be improved, there were varying responses. The most frequent suggestions were to increase the quality and size of the video, shorten the video by taking out repetitive sections, and provide more narration and instruction during the video instead of having long gaps without audio.

Overall, I was very pleased with the results of the cat skinning video. This was my first attempt at the filming and editing process, so I knew the video segment was going to be less than polished. I was pleasantly surprised to find out that 43 of the 48 students who completed the survey had watched the video. This means that even if the other 30 or so students who did not fill out the survey didn't watch the video, I still had at least 50% participation. I consider the amount of student participation to be a success given that this was an additional 15 minutes worth of time that had to be spent out of class. Also, by providing the students with the video for all the segments at the beginning of the semester, I feel that the final DVD product will provide the students with more time to watch the video, which would increase participation. Furthermore, to see that 97.7% of the people who watched it found it at least somewhat helpful was inspiring. This told me that almost everyone found some value in the video and confirms the need for this

thesis. I was also very pleased to see the suggestions were all elements that I had planned to address in my final video. To begin with, I knew the skinning segment was too long. When I created the trial segment I simply ran out of time to run through the film and cut out any more unnecessary video. Additionally, I realized the problem with the long gaps with no audio when I was moving it around but again, I initially ran out of time to do anything about it. Lastly, the quality of video was a problem due to having to post the video online. Next year's students will be getting the video on a DVD which will take care of all the quality and size issues with the video. I was very pleased with the results of the survey on the skinning video and feel that I was able to address the students' concerns adequately in the final product.

Sheep and Shark Brain (Trial for Identification Video Segments)

Out of the people who completed the survey, 79% watched the sheep and shark brain identification videos. The two most frequent reasons why some students didn't watch the videos was they did not find these sections to be complicated, they didn't have time to watch it, or they were unable to get the videos to play. When asked if they used these videos as a study tool, 58.3% said yes. Out of the students who watched the videos, 97.4% found them to be either very or somewhat helpful. When asked for suggestions for improvement there were again varied responses. The most frequent responses were to improve video quality, slow down when pointing to the structures, identify more structures, and use terminology that is consistent with the current lab manual. When asked if they would use videos that identified structures on the cat, similar to the trial videos of the sheep and shark brain, 95.8% answered that they would use the videos to help them study.

Overall, I was very satisfied with the results of the survey for the identification videos. I still had a high participation rate for the videos (79%) although it was lower than for the skinning

video. One potential reason for the lower participation rate could be that it was the end of the semester and a majority of the students were really tight on time. Furthermore, I introduced the videos as identification videos and not study aids. I don't think that some of the students realized that these videos could be used in this manner. The percentage of students who used the identification trial videos as a study tool is misleadingly lower than it should have been due to an error in my survey. I forgot to include a not applicable option for the students who did not watch the video. Taking this into account, 73.7% of the students who watched the videos used them as a study tool. I was pleased to see that 97.4% of the people who watched the video found them at least somewhat helpful. This supports my belief that these videos will be helpful to the students. The number I was most impressed with was the percentage of students who would have used cat identification videos if they were available. Almost every student said they would use the videos if they were available. This to me confirms the necessity of my thesis.

As with the skinning video, the comments I received were expected. I knew the quality was not going to be fantastic due to having to compress the video file to a size that could be uploaded on Blackboard. I also knew that the speed at which I pointed to structures was going to be an issue. There is a balance between the speed at which I cover the material and the overall length of the final video. If I identify the structures too quickly, students are not going to be able to follow with the video. If I identify the structures too slowly, the video is going to be long in length and the students won't watch it. I tried to address this in the final product by slowing down in complicated areas and also repeating difficult structures from multiple camera angles. The last two suggestions can be attributed to the change in lab manual. This year, we switched lab manuals. There was an inconsistency in the naming of certain structures. Since the Teaching Assistants had decided to accept the names from either of the lab manuals, and I knew we were

switching back to the old lab manual next year, I used the naming from the old lab manual. I knew this was going to frustrate some of the current students, but the naming was still correct and I was taking into consideration future classes. I was still pleased with the results and felt that I was able to address the students concerns in the final product.

When looking at the entire survey, I was very impressed with not only the participation with watching the video segments, but the overwhelming percentage of students who found at least some value in the project. This was especially promising considering which segments the students were provided with as a trial. To begin with, the skinning process is one of the easier processes in the cat dissection. It is essentially learning a few techniques and applying them over and over to the various regions of the body until the skin has been removed. If I would have used a more challenging video segment like opening the thoracic cavity, I probably would have had even better results. Additionally, the identification videos did not cover the cat. It is typically easier to identify structures on the sheep and shark brains than on the cat. Therefore, if I had used a video segment with a very difficult identification like the circulatory loops of the abdominal region, I probably would have had even better results. All in all, I feel the survey provided me with the assurance that my project was one that would be beneficial for students, as well as gave me suggestions for its improvement.

Creating the DVD

Armed with the survey results and over 30 hours of unedited footage, I began the long and arduous process of editing the video in early January. The first thing I had to do was to capture all of the footage from the video camera into iMovie HD. I accomplished this in five sittings which resulted in five separate iMovie HD projects. Knowing that I would be working in the CIM library, I purchased an external hard drive that had 500GB worth of space. This was a

crucial piece of equipment for multiple reasons. The CIM library has multiple computers and I was never guaranteed to be working at the same station each day. This meant that I needed a convenient and fast way to bring up my project no matter what computer I was working on. Normally, students will just copy their project onto the CIM drive that is accessible on all the computers in the CIM library. However, this was not a realistic option for me due to the sheer size of my project. In the end, I used around 380GB worth of space on the hard drive. With file sizes that big, it would have taken too long to copy the files I was working on to the CIM drive each day. There was, however, one major downside to having all of my information on one hard drive. While a file was exporting, importing, or burning, I was unable to work on another segment. This resulted in a big loss in productivity as I was many times forced to just sit and wait. If I would have had the project on two hard drives, I would have been able to work on one while the other was exporting, importing, or burning.

Once I had the video stored in iMovie HD projects, I started the editing process. The first thing I did was to go through and cut the video into large segments based on anatomical structure. For example, the video showing the musculature of the arm would be by itself and separate from the musculature of the leg. From here, I pulled each of these large segments in one by one and began cutting them down. After reading through the suggestions from the survey, I decided to go with a different strategy than initially planned. Instead of having 14 fifteen minute segments, I decided to cut the video down into small segments that were less than five minutes in length. I felt that if the video was cut down into shorter segments then there would be a greater number of students who would watch them. After about 150 hours worth of editing, I ended up with 54 sections of video that ranged from 45 seconds to around five minutes, with one video section that was a little over nine minutes.

From this point, I started the process of writing the script to match the video. Remembering that the students wanted more narration, I tried to have as few portions of the video without narration as possible. Additionally, I utilized both lab manuals from class in order to insure accuracy. The two manuals I used were: Manual of Vertebrate Dissection: Comparative Anatomy by Dale W. Fishbeck and Aurora Sebastiani and Comparative Vertebrate Anatomy: A Laboratory Dissection Guide by Kenneth V. Kardong and Edward Zalisko. I typed the script in a bullet point format so it would be easier to read when I was recording the audio. Each bullet point signified a pause that would be present when it was recorded. The script process took somewhere between 25 and 30 hours or a little over 10 minutes for each minute of video, and it was 35 pages in length.

I then started the process of recording the audio but ran into some major problems. There are only two rooms on Miami's Oxford campus that have both audio recording capabilities as well as iMovie HD. Furthermore, the two audio rooms at the CIM library can only be used two hours at a time. In addition, the CIM library has very limited hours on the weekend. Fearing that I would not be able to complete my project, I borrowed a macbook from a family member and went about the frustrating process of making it compatible to the editing software I was currently using. I found out that iMovie HD is the video editing program from the iLife 2006 software package. As such, I was unable to edit my project on any of the newer versions of iMovie. After days of searching and numerous phone calls I finally found a copy of iLife 2006 online and after having it express shipped, I downgraded the software on the macbook in order to run it. I then bought the snowflake microphone made by the Blue company and downloaded Audacity in order to record audio on my macbook. I figured out that I could record the audio in longer segments provided that there was enough pause between sentences. I was then able to export the audio as

long segments which could be cut and moved once they were in iMovie HD. The recording process took about 20 hours.

While I was editing the audio in iMovie HD, I ran into another problem. I had to export each segment after the audio was in place before I could move on to the next segment. The reason for this is there was no way to keep the audio in place with the video without exporting it. This meant that before I brought in the next video segment, I had to delete the edited audio that was left behind from the last video segment. This was extremely inconvenient because it meant that I would have to re-do the entire audio segment if there was a problem, instead of editing the existing audio. Furthermore, when I exported the video segment to QuickTime, I had to compress the files, slightly lowering the quality. After about 50 hours of work, I had all of the 55 video segments exported with their audio into QuickTime files.

Once the files were in QuickTime, I had to export each segment back into iMovie HD in order to add chapter markers. I split up the video into four major categories: skinning, musculature, cardiovascular, and urogenital/digestive. Within each major category there were chapters in between each video segment. Once I had the chapter markers in place, I exported each one of the four major categories into iDVD separately. Even after compressing the movies twice, the total size of the project was 30GB. Therefore, I decided to compress the project one more time using iDVD. This last compression got the total size of the project to around 8.2GB. Since I wanted all of the video to fit onto one disc, I used dual layer DVDs which have twice the memory capacity as a normal DVD. The entire process of exporting, compressing, and burning took around 30 hours. I finally had my finished project after eight months and over 450 hours worth of work.

Suggestions for Future Students

I started the project without any video filming or editing experience. Along the way I learned a few things that would have made my project more manageable. The following are changes I would have made in order to produce a better instructional video. The first thing that I would have done differently would be to work with a partner. It was very challenging to have to constantly move the tripod by myself and additionally, I was not sure what exactly was being filmed until I got to the editing room. I would suggest if at all possible having at least one partner for the video project. However, if it is not possible to find someone to work with, and the tripod method of filming is your only option, I would hook up a TV screen to the video camera. By doing this, you will be able to clearly see what it is you are recording instead of having to look at the small LCD screen on the video camera.

Another important aspect of the project is to plan out the filming ahead of time. If you know exactly what you are going to film, it will not only go smoother, but there will be less wasted footage that you will have to edit out later. Depending on the project, it may even be a good idea to write out a basic script ahead of time so that you can ensure that you have all the necessary video. Being prepared and organized will save you more time than anything else I will cover in this section.

Another way to save time would be to buy two smaller external hard drives instead of one large external hard drive. There are two reasons why this is a superior method. The first is it spreads out the risk. There is always a chance that something could happen to your external hard drive which may cause you to lose your project. If you have the project split up onto two hard drives, it splits up the risk so you would only lose half of your project. The other reason why this is a better method is it allows you to stay productive while a video is exporting, provided you

have access to two computers. While a video is exporting, you are unable to work on that computer or access anything on the hard drive. Depending on the segments it could take upwards of two to four hours to export a segment of video. If you have the project on two hard drives you can be working on the other half of the project while the first half is exporting.

In addition to two hard drives, I would use different editing software. iMovie HD is a nightmare to use on any major video project. The reason why the CIM library has students use iMovie HD is that it is a very stripped down program and easy for beginners to use. However, there are serious problems with compatibility. The first problem is that iMovie HD files can only be edited in iMovie HD. This makes sense but is a serious problem when you realize that it is outdated software that can only be found on the computers in the CIM library. In addition to problems with compatibility, the lack of user control is another issue. There are very few options for ways to conveniently compress and export your project. I ran into this problem when I tried to compress my video to fit onto one DVD. iMovie HD only allows you to compress a video and export it as a single file without chapters. This is a problem unless your project does not require chapters. Therefore, I would strongly suggest using either the new iMovie 2009 or Final Cut. These programs may take a little longer to figure out how to use, but the increase in options and compatibility will far exceed the difference in time it takes to learn.

Another suggestion I would have for students wishing to create an instructional video would be to be concise. The shorter and more concise the video is, the more effective it will be. If you have a five minute video which covers the same information as a ten minute video, it will be much more effective. The reason is that there is a greater chance people will watch it. The longer a video is, the lower the chance the students will want to watch it. Therefore, one of the most important things you can do is cut out anything that is not 100% necessary for your video.

Lastly, I can state that the process of editing and filming will almost always take longer than expected. Nothing ever goes perfectly smooth and one will always hit an unexpected snag along the way. Therefore, I would take the time you think it will take you to complete the project and double it. Overestimating the time it will take you to complete the project is much better than underestimating it.

Looking back at my thesis I am in disbelief at how much work and effort it took to produce a final product. However, I feel that this project will be worth all of the extra effort when the future students are able to utilize this video in addition to the lab manual. I thoroughly enjoyed working on the project and felt that it really stretched me in what I thought I was capable of doing. The knowledge I now have with video and audio editing is much greater than I ever dreamed possible. I am proud to have this thesis be my lasting legacy at Miami University.

References

- Kardong, Kenneth V., and Edward Zalisko. Comparative Vertebrate Anatomy: A Laboratory Dissection Guide. 4th ed. New York, NY: McGraw-Hill, 2006.
- Kent, George C., and Robert K. Carr. Comparative Anatomy of the Vertebrates. 9th ed. New York, NY: McGraw-Hill, 2001.

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Appendix

Assessment Statistics: Test

The statistics are calculated based only on the attempts being used in the grading option (Last attempt, First attempt, Lowest Score, Highest Score, or Average of Scores). If Average of Scores is the grading option, then all attempts are included in the statistics.

Name Test

Attempts 48 (Total of 50 attempts for this assessment)

Instructions test

Question 1 Either/Or

Did you watch the cat skinning video?

Answers Percent Answered

Yes 89.583%

No 10.417%

Unanswered 0%

Question 2 Short Answer

If no, please explain why.

Unanswered Responses

42

Given Answers

NA

- I didn't have time to look at it before class.
- I didn't have a chance to before the first skinning day, and then after that it didn't seem necessary to go back and watch.
- I felt that the lab instructor explained the dissection well enough and there were good pictures in the lab book.
- Ran out of time before the lab we skinned in. Also TAs were extremely helpful during the process so it wasn't necessary afterwards.
- Was not aware it was posted before the day of actual skinning occurred.

Question 3 Multiple Choice

How helpful did you find the cat skinning video?

Answers Percent Answered

Very helpful 37.5%

Somewhat helpful 50%

Not helpful 2.083%

Not applicable because I didn't watch the video 8.333%

Unanswered 2.083%

Question 4 Short Answer

If you watched the cat skinning video, in what ways could it be improved?

Unanswered Responses

16

Given Answers

- The skinning video can't really be improved, as the only way to really know how to do it is to actually do it.
- Possibly including some helpful hints or alternative ways to remove the skin in a more efficient manner.
- N/A
- The video was done well, I just think it should be suggested to use the lab manual to follow along with the video so it is more applicable when we get in lab, which is something I probably should have figured out on my own.
- The thing that made it difficult to understand is that you had to just watch a screen - maybe if you were to watch it while working on your cat it could be better.
- Body structures during dissections are sometimes difficult to see, and that is just an issue that such a video has to deal with. Not every structure is clear but by going slower or trying to really emphasize the area or structure of a certain part, it may help clarify.
- Maybe a better description of what was actually happening instead of the long periods with no description.
- no improvement

- The cat skinning video did not take into consideration that we did not have that same amount of time to complete it. We had to skin the cat in a two class periods and could not be as precise because we had to get things done.
- Image could be made more clear. Slow pace of video down.
- Begin with an obvious introduction and overview of the external anatomy.
- it was very helpful, but there was a little too much down time...could have been compressed a little
- it was fine
- It was a bit long, but overall it was a good video.
- maybe newer camera if available, otherwise good as is.
- Starting the skinning was the most difficult. That could be covered a little bit more. It also would have been nice to know when we were dissecting the muscle that we were supposed to single them out.... meaning separate them from each other not just clear off the fascia on top but completely around the muscle.
- It was difficult to see details on the video.
- Too long, the major points were helpful but a lot of it was unnecessary.
- Lighting and sound. Speed it up a little also.
- I thought it was good as it was.
- Maybe supplemented with the diagrams we used in class as it was hard to see some of the stuff he was pointing to in the video.
- The camera wasn't the best, resolution was kinda poor (for close ups). Good enough to get the general idea of how to skin a cat though.
- either talk the whole time or skip parts with repetitive actions
- I think it was done very well.
- I thought you did a great job on it- the angles were great and I knew where to look for things that were not clear in the manual.
- Maybe be more specific about how much to take off. My group was over caution about skinning because we thought the muscle was much closer to the surface than it was. It would be helpful to mention the components of the skin and fat that can be removed.
- I think that identifying the muscles like in the brain dissection video would be very beneficial when reviewing
- i don't remember
- When first skinning our cat, we unknowingly left a good deal of fascia on our specimen. The TA said that it looked fine, but we had not revealed any musculature. After going to open lab, another TA showed us that we still needed to remove a layer of fascia on all parts of our body. The video could have maybe helped us in this situation if it had better differentiated between fascia that must be removed and the outer twitch muscle.
- Overall I thought it was pretty helpful. It basically gave me a generally idea of where to start, how to cut, what parts were difficult.
- We didn't use the technique in the video. Also quality was not that great.
- There was no problem with the information presented in the video, but the link only allowed the video to be displayed in a small box. If the size of the video box had been bigger, more details could have been appreciated.

Question 5 Either/Or

Did you watch the sheep and shark brain videos?

Answers Percent Answered

Yes 79.167%

No 20.833%

Unanswered 0%

Question 6 Short Answer

If no, please explain why?

Unanswered Responses

38

Given Answers

- I could not get them to play on my computer.
- The internet at my house wasn't working and I didn't want to go to the library just to watch them
- They did not seem very complicated
- I did not have time to watch it.
- Primarily because I had heard the brain dissections were much easier than the cat was. I wish I would have watched the shark brain dissection.

- I didn't dissect the shark or sheep brains in our group.
- forgot to
- I never got around to it and the diagrams in the lab manual were pretty clear for those dissections.
- I primarily worked on the necturus, so I knew I would not be performing those procedures.
- Did not think those were necessary with how accurate the TAs described the process and the images in the book.

Question 7 Either/Or

Did you use the sheep and shark brain videos as a study tool?

Answers Percent Answered

Yes 58.333%

No 39.583%

Unanswered 2.083%

Question 8 Multiple Answer

How helpful did you find the sheep and shark brain videos?

Answers Percent Answered

Very helpful 35.417%

Somewhat helpful 41.667%

Not helpful 2.083%

Not applicable because I didn't watch the video 18.75%

Question 9 Short Answer

If you watched the sheep and shark brain videos, in what ways could they be improved?

Unanswered Responses

16

Given Answers

- We didn't need to know most of the parts described.
- Edit so that the name of certain structures come up on the screen as well.
- they were very helpful, the only improvement I can think of is there were times when the lighting was a little bad and I couldn't tell what you were pointing at.
- I thought they were good the way they were.
- N/A
- slow down in identifying
- The video was very clear to understand and we did not run into any problems in lab.
- A closer view of the specimen, or a clearer way of identifying things.
- They were pretty good. I don't know how they could have been better.
- I don't think they need improved. I remembered a lot of the information from the video and was able to apply it in lab, more so than the cat video. Although, I am not sure why.
- Clarity of speech and terminology.
- Would have been more helpful to identify/show where ALL the structures we needed to know were. He only hit on about half? of them. Close ups were a bit blurry due to camera.
- point out different parts while dissecting more.
- The shark and sheep brain videos were extremely helpful, and I probably wouldn't have changed anything about the way they were presented.
- I don't know if its possible to upload them so that they could be viewed larger - they were an EXCELLENT study tool, but difficult to see all the structure because the video appeared as a very tiny square.
- Maybe a better resolution if possible. Very clear and a great study tool. extremely useful. thank you
- Shark- he went over the easiest things, go over the hard things (nerves)!
- Sheep- again spend more time on nerves.
- They need to be slowed down when covering the actual points. You seemed to speak and point to items very fast. Im not sure if it would be possible to zoom in on the shark brain more at all.
- have a better identification of the cranial nerves of the sheep brain
- They were also very well done- the manual was very complimentary to it. Between the two I was able to find everything there was to find.
- Long. Break it up into segments.
- Again, it was difficult to see the structures in the video.
- Use the same names as used in the current lab manual or say all acceptable names of parts.
- Make image more clear. Slow down the pace at which you speak considerably.

- The shark brain video could be improved by showing how the student got from an intact shark head to the exposed brain. With how delicate some of the nerves are, it would be helpful to watch the demonstration from the beginning of the removal of the skin, muscle and cartilage.
- Same as above, sometimes structures are difficult to see. If you could organize the structures into telen, dien, etc and then locate those structures, it may help with the organization.
- I don't think they could be.
- Maybe insert overlays on the video that point out structures (this may be beyond your editing capabilities though).
- Maybe go a little slower when pointing out different structures. It would also be helpful to compare the structures to another specimen, especially in instances where the structures look a little different on other specimens.
- make sure they work on both mac's and pc's
- NA
- same as before

Question 10 Either/Or

If there were more instructional videos for dissecting the cat would you use them to help you prepare for the dissections?

Answers Percent Answered

Yes 77.083%

No 22.917%

Unanswered 0%

Question 11 Either/Or

If there were more videos identifying structures on the cat (similar to the sheep and shark brain videos) would you use them to help you study?

Answers Percent Answered

Yes 95.833%

No 4.167%

Unanswered 0%

Question 12 Short Answer

In the space below, please feel free to provide us any additional feedback in regards to either the cat dissection, sheep brain, and shark brain videos.

Unanswered Responses

33

Given Answers

- Identifying structures was the biggest help in watching these videos.
- I did not even think about using the shark and sheep brain videos as a study tool, but that would have been an excellent resource. I think the students that watched the videos found them very helpful. In the future, I would suggest having the TA's mention to the class that everyone should watch the videos because they would be an excellent study/identification tool.
- The videos were very helpful to study outside of lab, especially if you are not available during open lab times for extra studying. The cat dissection video was helpful in the sense that it gave you tips throughout the process but just because you watched a video doesn't mean you can successfully skin and dissect a cat without ruining any structures, etc.
- Good job. I like the idea, and I thought it was helpful.
- the more videos the better. it really helps to study with them when you are outside of the lab. thank you again.
- The skinning was almost the easiest part. There should be a video helping us to find some of the more difficult structures to find.
- I really would have liked to have an instructional video on how to open the cat's cavity. It would also have been nice to have videos on the muscles and veins as well. I would have also liked to have seen a comparison in the videos of how the structures, veins, or muscles vary between animals.
- Very helpful. Would have been a great assets when studying for the circulatory and muscle tests.
- I know it was time consuming, but doing videos on each of the systems that we were dissecting/learning would be a really great prep too.
- I thought the sheep brain and shark brain videos were so helpful for studying. It would be a really big help if there were more like that for other dissections in the future. I didn't skin the cat, but I still watched the video and it helped me. I thought the videos were a really big help, and I would definitely suggest them for next 201 class.

- I found the dissection videos very helpful. they, provided a opportunity to see what we will need to do in the lab instead of getting blind-sided of trying to figures out what to do from the reading. I thought the videos were also a great way to review and see an actual specimen
- The brain dissection videos were extremely helpful in studying for the practical. The cat was a little more difficult due to the differences in specimens that were used, but it could still be helpful for reviewing. I would suggest keeping the videos as part of the class as well as adding some more as supplemental help.
- Creating more videos for any of the animals to identify structures would be very helpful. The sheep brain and shark brain videos were a great study tool and I wish I would have had similar videos for other tests.
- The videos were helpful, but could be even more if they were a bit more clear
- I think it would have been extremely helpful if there were videos identifying muscles, mesenteries, and parts of the circulatory system in all three animals but especially the cat. The muscles and circulatory system were a ton of information and it would have been nice to have these videos as an aide for the dissection as well as a study tool outside the lab.