Representative quotes from structured triangulation interviews. For continuity, the questions just read “active learning” rather than the specific video (grayling, gilt darter, bird feeder) that was watched. These quotes expressed the general sentiments of the class, but also provided specific details about the assignment. The quotes are verbatim, but sounds that are not actual words (e.g., umm, uh) and duplicate words have been removed. Negative comments are overrepresented because they were not common, but do yield insights in students who did not like the exercise. As a guide to the trend analysis used in Table 6, we identified how these comments were classified in that table with italics at the end of relevant comments.

|  |  |  |
| --- | --- | --- |
| Question | Class | Comment |
| What was your favorite part of the active learning video assignment? | FANR 2015 | Probably just the research, learning about the type of fish and their habitat and all because that’s not something I’ve ever looked up or anything. I’ve never really done a scientific research project like that. I mean, I’ve done research on science topics and all, but I’ve never gone into the scientific databases and all the, I guess, more professional websites and researched essays for scientific information. (*scored as new*) |
|  |  | I think learning – or actually - getting to see the video and interaction between just, honestly following one fish the whole time was really interesting to me. Because each fish is different, but when you follow just one you realize so many more things about it, individually - if that makes sense. (*scored as new and enjoyable*) |
|  |  | My favorite part was researching about Artic Graylings and their habitat |
|  |  | The most important thing is being able to apply what you learned, and seeing it in action, and being able to recognize why these animals are doing what they’re doing. *(scored as deeper)* |
|  | FANR 2016 | I think going into the different behaviors was really neat—um—just having to be really mindful on what each behavior means is something that I really haven’t done when I look out into nature yeah, knowing, you know, knowing just the display behavior versus knowing a charge or something like that is just something I really haven’t thought about. (*scored as new and deeper*) |
|  |  | I would—I would say that my favorite part would be having to I guess, look at each behavior in a very precise manner (inaudible) and even though it was just about, you know, just the Gilt darter and just these two fish. Beginning the paper I felt as if I wouldn’t have enough, enough data to maybe write as much as directed but once I really looked at each super precise movement, (inaudible) I learned that, you know, there was more to it than just two fish swimming around. (*scored as deeper*) |
|  |  | My favorite part was probably the actual, like, writing of the scientific paper and just like I enjoyed getting to research, like, the background information I guess. Where I didn’t like as much watching the video itself and everything, but actually writing the paper I enjoyed. |
|  | FYO Spring 2016 | I guess one part that was good was just-like-getting to study-like-the fish and what they were doing and labeling it and-like-learning stuff because I have never done anything like that. (*scored as new and deeper*) |
|  |  | Probably watching the video and like coming up with my way of like tallying like the behaviors that we had to-I-so I guess like collecting the data that I put into my paper. (*scored as new and deeper*) |
|  |  | I guess like watching the video because I had never seen a video about a fish like that. (*scored as new*) |
|  | FYO Fall 2016 | I thought it was-- probably my favorite part would be that it was conducted like as if we were as if we were scientists—like-- studying the fish and so for—like—I’ve never done anything like that so I thought that was kind of cool. I mean it was also more difficult because I’ve never written a [sic] such a long research paper like that, but so I mean I guess it expanded my knowledge in that area, so, that was cool. (*scored as new and deeper*) |
|  |  | I guess maybe looking over it at the end after I spent that much time on it and seeing that I did write a paper about something that I had no idea about. I don’t know, most of the actual making it wasn’t my favorite. (*scored as deeper*) |
|  |  | Favorite part I think is to analyze the gilt darters behaviors from a natural selection point of view. |
| What was your least favorite part of the active learning video assignment? (Note, the students actually were given an example paper to follow) | FANR 2015 | My least favorite part was watching the video and recording the behavior. |
|  |  | Probably writing the entire essay. I’ve never done a research paper like that or anything, so it was kind of difficult for my first time trying to figure out how to do it and everything. But, So, yeah, that was probably my least favorite. (*scored as new*) |
|  |  | Probably the length requirement. I kind of struggled to get to ten pages on only observations, just because it is my first time observing an animal. So I didn’t really know what to look for. (*scored as new*) |
|  | FANR 2016 | My least favorite part, this may have been trying to maybe elaborate on behaviors that weren’t listed within the criteria on the rubric just because of my non-science major and my non-science background, just because I kind of lacked confidence as to what would be an appropriate behavioral name. Or if or if the behavior name that I thought wasn’t listed was one that was actually listed and I was just maybe seeing it in a different light. (*scored as new*) |
|  |  | Probably the number of times I had to watch the video, like, as the result of having to get every action recorded  Definitely writing the paper, like, in the format that Dr. Grossman wanted--I think that was probably the most difficult part. |
|  | FYO Spring 2016 | I think my least favorite part was-um-he gave us a list of behaviors and we had to figure out-figure out what these behaviors meant but there was not a lot of information on it so we kinda-I felt like I kinda had to guess and watch the video and try to match it and then hope that it was right so I think that was my least favorite part. (*scored as deeper*) |
|  |  | Probably having to watch the video so many times in order to-um-like see exactly what they were doing, so probably just the tediousness of it. |
|  |  | It would probably be writing the paper but you know nobody likes to write a paper. The charts were fine, I didn’t mind making the charts, but it was just kind of boring to like put your- just to write about it. |
|  | FYO Fall 2016 | I would say trying to record all the movements with the fish it just took me a really long time trying to do different trials and counting every single move and then the first time that I did it I didn’t realize that we had to record each fish so I had to go back and redo that. That was kind of frustrating but other than that it was just pretty hard and took a lot of time for me. |
|  |  | Probably, it just because tedious watching the fish—watching the fish video over and over again trying to find different things when I’m not exactly sure what I’m looking for, I guess, because, because we didn’t have much knowledge about the behavior of the fish before so it just kind of felt like winging it and just kind of pretending over and over again. (*scored as new*) |
| What was the most important thing you learned from the active learning video assignment? | FANR 2015 | Question not included |
|  | FANR 2016 | I guess just being able to apply information that you researched that you get from both, like, different internet resources, so, like, different papers that other people have written and then also information that you are getting for yourself from watching the video and everything and just being able to combine that all together in a way that flows well and that actually applies to the question that you are trying to answer and the observations you’re trying to make and then I guess, yeah just being able to apply all that to, like, one conclusion. I think it’s a really good skill. (*scored as deeper*) |
|  |  | Probably just more about the actual species and, um, trying to, like, formulate, um, like, analysis and stuff about a certain, like, topic, more scientific topic than, like, what I am usually writing about, so I think, like, trying to just write in that manner was the most interesting part of, like, having to do the assignment, but [sic]. |
|  | FYO Spring 2016 | I guess like the scientific process of writing of writing a scientific essay like that, and studying it, and labeling it and then writing out the methods and stuff like that. (*scored as deeper*) |
|  |  | I think it was to like watch a video and be able to pull certain like specific details out of the video and like make like you know so that you can write a paper about it so that you had to like understand what was happening and like understand about their like life and like what they did, so it just made you think harder about it. (*scored as deeper*) |
|  | FYO Fall 2016 | I think it’s the importance of natural selection since every—every single behavior has its own significance |
|  |  | Most important thing I learned I mean, I guess, just learning how to analyze the behavior of animals ‘cause I’ve never really done that before, and that was kind of neat, to get to learn so yeah. (*scored as deeper*) |
|  |  | Probably how to write a research paper in that kind of context—in a scientific context I guess. (*scored as new*) |
| How could the active learning video assignment be improved? | FANR 2015 | I think it would have been at least more entertaining to watch maybe different videos of different fish instead of just a long 15-minute video – or however long it was - of one type of fish. |
|  |  | A little bit more instruction at the beginning of the assignment would be nice. Because, a lot of people were very confused about what all he really wanted us to do. Because it wasn’t just recording behaviors, it was also a lot of parts where he wanted us to find other information on Salmonids and things like that - just a little bit more clarification would’ve been nice. |
|  |  | I think we should go over Grayling behavior a little more in class. Because it was really hard for me, having no background knowledge, watching the video and figuring out what was going on. |
|  | FANR 2016 | Maybe I think the rubric could have been a little bit more clear because I feel like the thing that helps me the most was reading the example papers that were given and that kind of helped me understand more what I was supposed to be doing but just by looking at the rubric it wasn’t particularly informative as far as, like, actually describing what we were supposed to write, what we were expected to do just beyond observing the video and, like, making some kind of scientific conclusion about it. But again, I think the rubric could just be a little more clear about what the assignment actually is. |
|  |  | I liked how it was setup, um, I think that it made us do a lot of good research and learn about the species. I do, however, I would say probably just the length of the paper was a little too long and, I’m a, I’m a good writer, it’s not hard for me to write, but, um, 8 pages was, I found was probably a little bit too long for the activity. (*scored as new and deeper*) |
|  | FYO Spring 2016 | I think if we went over it in class a little more-specifically about gilt darters-um-and talked about the fish behaviors more I think that would have helped-um-instead of just starting from scratch. I think that would have been helpful. |
|  |  | I actually wouldn’t mind it being like a partner thing because sometimes I would want to like check my information and like see if that could-if it like compared to anybody else’s, or if I was doing it in the correct way of like if someone else had a different interpretation of the behaviors observed. |
|  |  | I would say the assignment-I mean I don’t think that it was-I don’t think there is necessarily could be any improvement. I just think a guideline of what to do and how to go about doing it-um-I am just not a big fan of writing papers, but other than that I didn’t-I thought it was a good project. (scored *as enjoyable)* |
|  |  | I thought it did its job as [sic] well, I-I can’t think of any improvements currently. (*scored as enjoyable*) |
|  | FYO Fall 2016 | Probably more in class instruction on how to write the paper or—we could have been given more knowledge about gilt darters behavior so we kind of know more what to look for, I guess.” |
|  |  | Well make it a couple less pages and maybe show us— I mean he put an example um on his on ELC, but maybe like pull up an example in class and like go through it and like explain like how we can look up each part because there were different parts, like a research part and like a discussion part and like thoroughly explain how we can write it and like, I don’t know, that would have helped. |
| Other Comments | FANR 2015 | No, no, I actually did enjoy the assignment. I thought it was an interesting and thought provoking exercise and I think I got more out of that than just the general paper. (*scored as enjoyable*)  I would just say it’s a – it’s a - really tough assignment for people who aren’t good at science and aren’t interested in science. |
|  |  | It was really nice that some people could turn it in early and get information back. That was very helpful because my grade improved 20 points when I had his revisions. I don’t think a lot of people took advantage of it, but those who did definitely took advantage of it the second time around and I know that I got over a 100 on it after the recommendations had been made, so - very helpful. |
|  |  |  |
|  |  | I mean think that it’s a good assignment. It’s a good way to help the students kind of explore different aspects of what we’re learning about and to actually go deep and look through it some more. Yeah, I just think its [sic] just – to give more clarity more clarity, especially for the students who aren’t science majors. (*scored as new and deeper*) |
|  | FANR 2016 | No substantive comments |
|  |  |  |
|  | FYO Spring 2016 | No. I think I learned a lot from it. You know-good assignment. (*scored as enjoyable*) |
|  |  |  |
|  | FYO Fall 2016 | I feel like this paper is too long—I mean—too long—to—to write on one single point. So—I-- it’s kind of difficult to write a 8 pages paper just based on the significance of natural selection.” |