**Dr. Ogle,**

**I wanted to ask several questions about your class and email that you sent us Friday afternoon. If you could address these in class I think it would help to clarify your teaching strategies.**

DHO -- Thank you for your questions, all of what I think are very fair, though I do not believe the premise for all of them. Class time is precious and limited, so I would prefer not to use class time to address these questions. However, I provide detailed responses below.

**1. Can you see why some of us would choose to leave class 10-15 minutes early because there are already several students with hands up waiting for your attention? From general observations it may take between 3-5 minutes a student to clarify a question.**

DHO -- I argue that the observation that “several students with hands up waiting for your attention” has rarely if ever been true in this course. This may have been true on a few days where some students were wrestling with computer-related issues that I was unfamiliar with (some related to College computers, some related to their computers). However, this was most certainly was not the case on Friday. However, I try to deal with this issue by working with students as quickly as possible and stopping to address the entire class when I see that a question has arisen more than a few times.

To answer your question directly. No, I cannot see why a student would do that. To me, it is an odd strategy for someone to have a question and, because I might not get to you in a few minutes, you would decide to leave and not ask your question. Could you not move on to something else until I could answer your question? I also very much doubt that this is the primary reason why most people have left class early. Regardless, I will work harder to make sure that I get to as many of you as quickly as I possibly can.

**2. What would be your response to students who feel that we are not getting what we paid for when it comes to in class time? Can you see why a student my get upset in realizing that their money is paying for personal tutoring for other students during what is traditionally lecturing time? Should one-on-one tutoring not be saved for office hours and classroom time be saved from presentation of new information?**

DHO Background … I am sure that it is obvious to you that I have chosen to teach this class in a non-traditional way and I have been upfront about that since day one. There is a great deal of research that suggests that traditional lecturing is not particularly effective for deep learning (not everyone agrees with this, but try an internet search on “do lectures work”). I tend to believe this research, especially when it comes to simple concepts of understanding definitions and applying simple calculations, which is the bulk of this 100-level statistics course. Thus, I have designed the course so that simple concepts and factual statements can be learned (or at least provided) prior to class and then those concepts applied in class (and on homework) to cement and deepen learning. In a traditional lecture, you would hear me define types of variables or explain the steps for computing a median, but the only practice that you would get is on one (or a few) homework problems. My experience suggests that students need more practice applying concepts. This design for the class is an attempt to get students more practice, while also doing that in a situation where you can get near immediate help from the professor. You should also note that I will mix in more lectures later in the semester when the concepts are more nuanced and difficult and I know from experience that most students will struggle with them.

In response to your three questions – 1) I believe that you pay for more than class time. You pay for my expertise, both in terms of statistics and pedagogy. My expertise in both of those realms has led me to organize and teach the course in the way that I described above. Beyond that, I can only say that I am sorry that you feel that way (and see my next response). 2) I think that this (“paying for personal tutoring”) is a gross over-generalization of what happens in the classroom. However, I do understand why someone would get upset if this was their perception. Teaching a course has trade-offs. When the class was lecture-based, I received e-mails like yours that suggested that students that could not learn from 1.5 h of lecture were not getting their monies worth. I am trying to find a balance for all, while still following what my training, my intuition, and the research of others suggests is good practice. 3) My answer to this is “no” and much pedagogical literature supports that. [I have assumed that you mean “saved for” rather than “saved from” in this question.]

**3. What would be your response to a student who says that "R" is getting in the way of learning basic statistical analysis concepts, especially in a 100 level class? Can you see why students may feel like "R" is detracting from their ability to learn and demonstrate simple statistical concepts, especially when "R" may not be a resource available to them at a later date?**

DHO – My answers to your questions. 1) I am sorry that you feel this way. But here is my perspective. I want this class to use real data as much as possible (again, much pedagogical research suggests that using real data leads to more engagement and deeper learning). Real analyses on real data require some sort of “tool” to make it “easy” to calculate items that we then need to interpret. For example, we are not going to compute a two-way frequency table followed by a chi-square test for 5000 responses to a questionnaire, nor are we going to compute a two-sample t-test to determine if the mean response between two groups of a few hundred individuals differs. These are untenable, unrealistic, and offer no pedagogical value to compute by hand. In addition, hand-calculations simply are not done in the “real world.”

So, we need a tool, but why R? R has real advantages over other softwares – it is free (so all students can put it on their own computer), it is reproducible (in contrast to a GUI), and it is becoming the standard statistical analysis program in many fields. Excel costs money and is known to have computational errors. Software packages like SPSS, SAS, SYSTAT, MINITAB, and JMP all cost $1000s of dollars. Graphing calculators are not realistic for “real data” and, in my experience, have never been used to do “real statistics” outside of a high school (or some college) classrooms. Webpages that can perform some statistical calculations are limited (they don’t generalize to larger analyses), unreliable, and not what is done in the “real world.”

I have mentioned in class a couple of times that you need to be patient with R, especially at the beginning of the course. We need to spend some time to learn this “tool” and once we have learned it then it will make life relative to statistics easier. I ask that you continue to be patient with it (and ask me lots of questions). [For what it is worth, I have made a note to myself for the next time that I teach this class that the “Intro to R” portion will be much more streamlined and we will only learn some of the functions (e.g., filterD()) as we need them, rather then “up-front” as a stand-alone chapter without much context.]

2) I do not “see” your second point. How has R kept you from demonstrating your knowledge of the difference between natural and sampling variability, why cause-and-effect statements can be made from experiments but not observational studies, or describing the distribution of a quantitative variable recorded on dozens of individuals? I understand that you might be struggling with R, but I’m not sure that I see that it is a major roadblock to learning those basic statistical concepts. I would also argue that in the future that R will allow you understand and utilize statistics in a more informed way (i.e., by performing the chi-square and t-test examples mentioned previously).

Also note that R is free and open-source. As long as you have internet access you can access R. Also, for what it is worth, it is my understanding that there are versions of R that will run on phones and tablets. So, generally, I would say that R is one of, if not the, most available softwares for doing statistics. In addition, there is no evidence that R is going to “go away.” It has existed for 20-some years and is supported by a large and engaged international open-source community. So, in response to your last statement, if you have access to the internet then you will have access to R.

**The amount of work that has gone into writing the book, writing the “R” programs we use and designing the website are clear. What is not clear is why class time seems to be a study hall and why “R” is being used to take the place of graph paper and a calculator in a 100 level class.**

DHO -- Thank you for the compliment. I hope I have made clear (though I understand that you might not agree) my perspective relative to your last sentence.

I would like to add that I likely come across as defensive in this response. I firmly believe that this pedagogical approach will lead to the “most learning” and that R is the tool of choice for doing statistics (at all levels). I do understand that this approach and tool are new or different and uncomfortable to most students. I have tried to provide as many resources as possible, including my time, to help you overcome these “issues.” I understand that there is room for improvement and I am constantly reflecting on how to create a better class. I do thank you for raising these questions, as both an opportunity for me to further reflect on the course, but also as another opportunity to explain why I have chosen to teach this way. I welcome further questions and feedback, though I will only respond like this to all students in the course if I think it benefits most everyone.

Finally, I would be remiss in not telling you that if you feel like I am not responding properly to your concerns and would like to discuss this further with my “superiors” that the usual process is to talk to my Department Chair (Professor of Biology Dr. Wendy Gorman) and then Dean Dr. Les Alldritt.