Research: Agony or Ecstasy? Reflect on how this course has changed your perception of how science is done.

Tom Cassano

I always had a feeling this course would be a positive experience for me and, perhaps, it was an experience I needed. My stay in Panama has been incredible. I have been fascinated by the vast biodiversity and richness of life within the rainforest. However, this course has not been a glorified vacation. Throughout the duration of the course I have been learning and challenging myself. In addition to learning about tropical ecology, I have learned about the extensive work and effort research entails. This may sound frightening to someone considering the course, but know this—this course has been an incredibly rewarding experience. Kaitlyn and Jon's input towards my research have may seemed critical at times, but it was necessary. I have learned that much more about what it takes to organize and conduct my own research. Their expertise and constructive feedback has made me that much more of scientist. Although challenging, I can honestly say that course has made me more adamant about working on more research projects. I certainly can say this has been a worthwhile experience which has helped me build an improved scientific skillset and reconsider where I stand as a student for the better. To answer the question, this course has been both agony and ecstasy, and I loved every minute of it.

Melissa Hayhurst

I was stressing coming into this trip knowing I would struggle with picking what I wanted to do my project on. The course starts with a lot of amazing hikes. On these hikes, you see tons of new species of plants and animals, and your professors encourage the thought process of asking questions about why organisms look or behave the way they do. You have much more time than I expected to formulate your research question. This course has demonstrated to me all the considerations that go into constructing a scientific study and writing a scientific paper. There's so many factors that can be affecting your data, so it's hard to figure out ways to isolate against them. This stuff takes time. I met a lot of researchers who have been living here for years or coming for months at a time for 3-5 years in a row. I gained respect for these researchers for uprooting their lives and dedicating themselves to their research. I also got a lot of insight into data analysis, much more than I learned from taking Statistics for Life Sciences freshman year. I don't have high hopes of getting my work published, which is something I thought would be awesome coming into this trip, but this was my first time conducting my own research project. There were constraints on time and technology. I'm just glad I can be able to say I did this, and come away with all of these awesome experiences that not many people have.

Daniel Karstetter

After 2 years of being in the W.P. Carey School of Business, I decided to completely change the path that I was on. I just couldn't imagine myself being surrounded by the type of people that came with having a Finance degree. I hate to come across so judgmental, but I truly felt like I would not have been able to fit in. Switching into a STEM major was the best decision I could have made and I couldn't be happier. With that said, I did not utilize my first 3 semesters in my

new major as well as I could have. I put all of my focus into my classes and didn't put any of my time into other activities. I finally decided that I needed to branch out and step out of my comfort zone. Signing up for a study abroad program was that next step toward becoming a more well-rounded college student. I came to Panama with the intentions of bettering myself and had a mission to come back to ASU with skills I would be able to apply to a variety of situations I would encounter. Most STEM major plan to enter grad school after completing their undergraduate degree and I knew that a program such as this would provide me with the necessary tools to be successful in more aspects of my education than the letter grades I receive from my classes. I would recommend this program to anybody that actually wants to gain transferable skills that they can use in all walks of life. I couldn't be happier with the experiences I have had with this course and cannot wait to approach my final year of college with a completely different mindset.

Nhu Nguyen

Arriving in Panama earlier this June, it still did not hit me what an amazing adventure and experience this program was going to provide in only two weeks. As an undergraduate student planning on going to medical school, I have experienced numerous science-related courses, volunteering at the hospital, shadowing doctors, etc… However, nothing has compared to the hands-on activities that I was subjected to with this course. The chance to hike day and night in order to spark an inspiration in the middle of this humid, diverse, and tropical country is beyond what I could have ever imagined. The supportive environment provided by the instructors allowed me to conduct and complete a scientific research that I could have never dreamed of. They encouraged my creativity, fueled my passions and motivated me when I encountered any and all kind of struggles. Furthermore, being in Panama with other students who share the same hopes, desires and futures as I do has led to so many new friendships. These are the people that I have shared a journey with, a journey that no one else can ever understand but us, a journey filled with science, biology and curiosity.

This course has revived my love for science, it showed me the reason why I was ever interested in science in the first place. Most importantly, the fact that I was given a chance to conduct my own research project, on a topic that I am passionate about is physically draining, but emotionally fulfilling at the same time. At one point in the program, there were a lot of pressure on the students because it is a huge deal to be conducting your own research. However, each one of us relied on each other, we vented to release stress, played cards to bond, and helped each other out so that we can finish our projects together. In the end, after finishing the project, completed the written report and presented my research, I realized that I appreciated this whole program for what it was. I appreciated the level of rigor that I was subjected to, I appreciated all of the times the instructor watched as I struggled through my thinking process instead of giving me the answers. I appreciated all of the challenging questions they posed so that they can watch me struggle. Most importantly, I appreciated the chance to learn.

Tess Prendergast

The most important lesson this course has taught me is that research is never finished. From all the talks given to us by scientists at the Smithsonian Tropical Research Institute, and from my

own research, I've realized that the hypothesis you start with is rarely the one you'll end with. Beyond that, though, all the patterns and oddities you recognize during the course of research will lead you to even more predictions and hypotheses, and on and on, apparently forever: each discovery must be explained, and in the explanation for one phenomenon lies a multitude of new questions. This process of discovery and re-discovery is at the core of science as a discipline. In the field, I often found it hard to remember that philosophy, and became frustrated when my data didn't fit with my predictions or hypotheses. The ability detach your emotions from your results, to look at the world critically but with curiosity, is a skill that I could not have acquired without this experience, and I know that it will invaluable to me in whatever discipline I choose to pursue.

Zach Roland

Before this research class begun I thought that research was an easy task that was only necessary because it was required in the degree plan. I could not have been more misled. Research, as it turns out, is one of the more difficult aspects of science. I previously believed that research would be a monotonous activity where we were given direction by the instructor of the course. This course totally changed my perception on research. During this course I found out just how difficult that research can be. This course proved tough from the very beginning of developing a question all the way to writing a final paper. However, I must say that this by far may just be one of the most rewarding classes that I have ever taken. There was daily struggle with constant research and collecting data. But in the end, it proved to be a task that made me feel very accomplished when it was all over. All in all, I couldn't be happier that I took the risk to come to Panama. This experience will forever change my perception of researchers and change the way that I look at research in general. This field of work is difficult, and I think that everyone should know what it takes to complete research.

Lauren Welch

Conducting my own research project has been an extremely rewarding experience, but it is true that the most rewarding experiences are also the most challenging. I knew the process of conducting research was complex and interesting, but I did not expect how difficult it was to build an idea from the ground up. Being in the tropics surrounded by life and diversity is incredible, but the immense diversity also made picking a research topic seem impossible. Once I did pick an idea, an entire new set of challenges appeared. When attempting to test an observed pattern, I quickly found out how difficult it was to control for all the possible variables in the experiment. Every prediction or hypothesis made founded more questions, variables, and potential problems to think about. Even a simple question could quickly become a seemingly unmanageable project. But overcoming these challenges and pressing on gave me confidence and a deeper understanding of a process I did not know much about previously. Even once data collection began, my project was still evolving. I thought my original methods would be the perfect way to test my hypothesis, but once I was out in the field I realized you cannot predict everything before you try. This process of refining methods, changing hypotheses and narrowing down data collection felt disheartening at times, but knowing all the hard work would pay off made everything worth it. In the end I feel like I gained an immeasurable amount of knowledge and experience from conducting my own project. Nothing can replace the

firsthand experience of working in the field and overcoming problems to ultimately achieve a goal. I feel like a stronger person both emotionally and mentally and feel ready to continue my biology journey.