Student Post: Storytelling and Human Culture

Jillian Lyles is a 2nd year graduate student in the School of Marine and Environmental Affairs at the University of Washington. Her work focuses on how knowledge forms other than western science can inform and benefit human relations around and the management of marine resources.

In our first ENGAGE course, we touched on the art and power of storytelling. Storytelling is such a fundamental aspect of human culture, and is a language that every person can understand and relate to. Thinking back to our childhood experiences, everyone can recall a story told to them. Stories hold so many different purposes. They are tools to teach, to engage, and to excite the audience. There are stories of encouragement and stories of wonder, stories of how things work and how the world came to be. Most often, stories help spread cultural norms. But stories can also be used to convey information or explain scientific phenomena.

When I was an undergraduate, I spent a semester in Hawai'i studying earth sciences and sustainability. As a component of this semester, we took a Hawaiian language and cultural course to learn about the people that cultivated the land and the land that the people lived from. Prior to western contact, like many cultures, Hawaiian was an oral tradition spreading their teachings and

messages through storytelling and instruction. Many stories that the Hawaiians told held important messages about how the world works.

One story I remember in particular is the story of Pele, the fire goddess, and her search for a home. The story goes that Pele set sail from Polynesia in search for a new home. After some time at sea, she finally reached the Hawaiian Islands. Starting at the western most island, she traveled down the island chain looking for a suitable place to call home. After several encounters with her sister Namaka, the goddess of the ocean, she finally found refugee on the Big Island of Hawaii. Scientifically speaking, this story explains the geological history of the Hawaiian Islands perfectly. The Hawaiian Islands are formed by a hot spot, or an eruption of magma, in the middle of the ocean. Pele represents this hot spot, or fire coming from the ocean, that goes on to form each of the islands from west to east. The battles between Pele and Namaka, or the lava and the sea, represent the interaction between land and sea during island formation. The active volcanoes are located on the Big Island of Hawaii, where Pele lives, and there is another island forming off the coast of it.

Before this semester, I never thought that story and science could mingle. This semester in Hawaii strengthened my understanding of the human connection and relatedness to each other and the environment, and showed me how powerful stories can be. Now as a graduate student, my work advocates the use of knowledge systems other than western science to inform environmental management plans and regulations. Knowledge systems like Hawaiian ecological knowledge held in stories and myths that can explain and provide meaning to observed scientific phenomena.

Often times with science, certain concepts are difficult to explain to individuals that are not well versed in the discipline. Storytelling is a great way to explain these confusing systems and ideas so they are accessible to a larger audience. Though currently under utilized by the scientific community, it is promising that in days to come we will see this powerful tool being used more frequently.

Student Post: Storytelling and Talismans

Marshall Styczinski is involved in physics education research, concerned with improving the teaching and learning of physics. He is a fourth-year PhD student in physics at UW, studying interactive media as a tool for enhancing student learning.

Though the improv games we played for our first Engage class were a bit of a shock, the return to high school English in covering the story arc struck me like a well-aimed dodge ball to the face. It would be lying to claim I remembered more than two of the five typical phases. (In case you have also forgotten, the ones we identified were setup, complicating action, development, climax, and resolution.) As soon as we breached the subject, I reflected on the last handful of presentations I had given. I was dismayed to realize that they all would have benefited from the relatively simple approach we were now being encouraged to employ.

As we discussed the merits of storytelling in presenting science, I thought back to the brief introductions we had just been videotaped giving. The ones I found most engaging, I now realized, had framed their introductions as stories. Already I had some indication that our class time would be quite valuable. The five-minute introduction I had prepared was substantially longer than the 30–120-second presentations we were suddenly in the process of giving. Worse still, seemingly everyone else did not go to the same detail of personal background I had intended–most

presentations were research-only, whereas I had planned to talk about my beloved cat and career aspirations. Caving to unspoken peer pressure, when it came to be my turn I blurted out a few things related to my research, punctuated with a jargon word or two. I'm beginning to suspect the "miscommunication" leading to the shorter presenting time was actually intentional!

Another realization from our first class that lifted me up was the stark simplicity of the suggestion to present a story. It's obvious in hindsight, and so central in planning a presentation as to be impossible to forget. Reflecting on my expectations for the class, straightforward rules-of-thumb and simple guidelines did not register as possibilities. The course syllabus now appears to me to be filled with talismans, to be collected into a pile and sown in every pocket; this, so that they may be reaped as needed: when suddenly put on the spot or answering questions (improv games), when writing presentations (storytelling and jargon) and delivering them (visual communication), networking (elevator pitch). The benefits are unmistakable, even just from the content I recognize in advance! There is a lot to look forward to for this quarter!

Student Post: Talk to Your tOAStER

Max (aka Gordon) is a graduate student in a dual oceanography and astrobiology program, studying bacterial life in sea ice. He looks at how this life adapts to the extreme conditions of the Arctic, and how we might use our knowledge of these organisms to improve our search for life elsewhere in our universe.

Remember that warm, musty nostalgia of your childhood camp cabin – a smell of cool pine mixed with the excitement of new friends, evenings by the fire, days in the sun? Now shatter that image with two kegs and some hard-core science. Welcome to tOAStER.

“Gordon,” you might say, “Toasters belong in the kitchen – not a campground.” I can’t argue with that, except to say “who are you to tell me where my toaster belongs?!” And while I’m certainly not one to tell people how to organize their appliances, I will be the one to tell you that you should probably leave this toaster at Friday Harbor Labs. You see, for one weekend in January, toaster stands for ‘the Oceanography All-Student Educational Retreat,’ and it doesn’t make a crispy breakfast out of bread. It makes competent presenters out of graduate students.

For a least several hundred years, tOAStER has been an opportunity for grad students in UW’s School of Oceanography to practice their presentation skills by delivering a low-pressure, twenty-minute talk on their topic of choice: crows, the Canadian postal code system, how scientists believe crazy things, you name it. By allowing students to speak before their peers about their passing interests or deepest passions (honestly, the Canadian postal code system…), tOAStER invites the quietest students from the back of the room to take over the front stage.

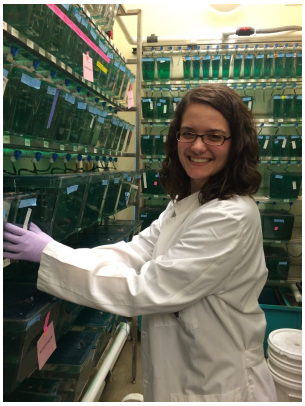
It turns out this strategy is wildly successful. With the aid of nagging event coordinators (me), we were able to convince (coerce) twelve people to speak on a diversity of topics, including topical speaking and the diversity of people. Given that graduate students voraciously seek that adrenaline rush of procrastinating until the last second to prepare, this *engaging* (ding ding ding!) experience has the added benefit of practicing spontaneity. This spontaneity is bred from familiarity: as students are comfortable in the knowledge base of their topic, they are able to step over the hurdle of self-doubt and focus on delivering their speech in an exciting and conversational style. Additional take-aways from tOAStER talks may reveal:

- The best power points are the simplest power points
- The speakers at the end of the day have to be especially exciting to keep attention
- There’s no substitute for good humor
- Those who have consistently presented at tOAStER have consistently gotten better at presenting.

You might also have been tempted to take-away that bears have a variable gestational period and we still don’t know how long it is.

“Gordon,” you might say, “how do I become part of tOAStER?” Well, you don’t. Unless you apply and are accepted to the UW School of Oceanography graduate program. But for the majority of the human population who has better things to do than play at the beach for the next 6 years, you can still practice the spirit of tOAStER if you just practice. All the time. Speak to yourself in the mirror, give speeches to your friends, take every chance you get to speak to a public audience about anything you can. Heck, talk to your own toaster, and some interesting discussion might pop up. And remember, whatever you do, the most important part of the spirit of tOAStER is that you never, ever forget the kegs.

Student Post: What it's like to be a Non-Expert



Sarah Pickett is a PhD student in the Graduate Program in Neuroscience at UW. Her research focuses on the development, death, and regeneration of specialized sensory neurons used for hearing, called hair cells. Outside of lab, Sarah sings with the Northwest Chamber Chorus and volunteers at the Pacific Science Center as a Science Communication Fellow.

As ENGAGE students, we're working to develop tools to effectively communicate our research and scientific ideas to non-scientists. We've started by learning about storytelling and becoming more aware of jargon in our fields. We've discussed body language and confident presentation style. So far, the course has left me mulling over something that I haven't considered in a longtime: what it's like to be a non-expert. The thought stood out to me after perusing our course reading, particularly physicist David Mermin's article "What's wrong with those talks?" He writes: "Never, ever, have I heard anybody complain about a talk on the grounds that 'I understood everything in it.' People feel good after talks they understand."

As a neuroscience student, this sentiment really resonates with me. Neuroscience is an incredibly broad field with many subdisciplines. Researchers who perform, say, human brain imaging, can have a very different body of knowledge than researchers who study crayfish escape reflexes, for example. While being lumped together has great benefits, it also means that any general neuroscience audience is bound to have non-experts. In spite of this, many researchers give presentations to this audience without recognizing the differences in expertise. I have felt the frustration of not understanding a talk and the ensuing boredom as I listen to a speaker connecting only with the aficionados in the crowd. As students we've all had this experience, yet it's remarkably easy to make the same mistake when giving our own talks.

My interest in learning about and trying to improve how scientists communicate has grown and changed over time. I first appreciated the importance of effective science communication after watching the documentary film Flock of Dodos. The film depicts debate in Kansas regarding the teaching of intelligent design alongside evolution in science classes. Both scientists and proponents of intelligent design are interviewed. Although it's been nearly 10 years since I watched the documentary, I still remember leaving with the feeling that the scientists weren't very good at expressing themselves. In their passion, the biologists became angry and flustered—a stark contrast to the calmness of the intelligent design proponents. If this was the impression that I left with as a fellow scientist, I can only imagine how abrasive they appeared to others.

This week I discovered that Flock of Dodos was written and directed by someone who also feels strongly about science communication: Randy Olson. Now that I think about it, it's quite fitting that many of our class lessons come from this former scientist and now documentary filmmaker, and author of Don't Be Such a Scientist. His book, much like the goal of the ENGAGE course, seeks to help scientists make their research more relatable, compelling, and comprehensible to the general public. This quarter, we'll put these lessons into action!

Student Post: Why I might wear a Mickey Mouse suit for my next talk about my research

Tiffany is a dual master's student in Social Work and Public Health with thirteen years of experience in health research that includes consulting with organizations on ways to maximize their studies' performance by using social media and reviewing the ethical conduct of studies. For her master's thesis she is interviewing professionals in research ethics from across the country to shed light on the issues of concern regarding social media research and their respective organization's lack of guidance concerning this issue.

This past week, our ENGAGE class was focused on audience types. Who are we trying to communicate with when it comes to science? All of us are required to give a 20-minute talk at Seattle Town Hall this spring and I am dreading the task because I know my audience will be made up of friends, family members and maybe even some of my former supervisors or a few strangers. I'm not sure how the hell I'll deliver a talk that keeps all these different people awake and interested for 20 minutes, especially when I still can't nail the quintessential, 2-minute "elevator pitch" that is due for class tomorrow. For now, let me focus on what happened last week in class.

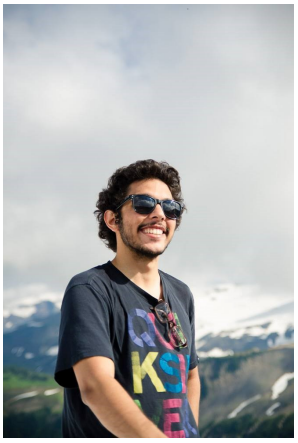
We reviewed a talk given by Princeton University's Dr. Susan Friske that made me doubt that my above question on audience consideration was the right one to ask. Instead, I need to begin my quest to make different audiences happy by first reviewing the research on how researchers and scientists are perceived. (It's funny to think, but most researchers never study, let alone read, research on themselves. We're far too interested in everyone else.)

Listening to Dr. Friske's talk, I learned what stereotypes people assign to me before I even open my mouth. Compared to other professions, the general public assumes that I am probably pretty competent and trustworthy the very minute I am introduced as a scientist or researcher… but that doesn't mean they like me. To understand why my profession causes others to dislike me, I consider the work of Dr. Friske's graduate student, Cydney Dupree, who asked people to rate different professions on two different spectrums: warmth-coldness and incompetence-competence. Not surprising, the results of her work presented a graph of just how cold we professional nerds are seen which may explain why I don't feel confident that people will be able to survive me talking for 20 minutes. Even more bothersome, the researcher/scientist profile of being competent but cold was grouped with other professions I consider researchers and scientists to be most unlike, namely CEO's, accountants and lawyers.

This really irked me (no offense to all you poor law school students out there) and I found myself defending scientists and researchers to my fellow ENGAGE classmates, as if doing so could help me strip the common negative misconceptions that have afflicted my field for as long as the birth of

science. “Scientist” and “researcher” are labels that I proudly bear and ascribe to some of the people I admire most in life, including my mentors. We are funny, humble and dedicated people who sacrifice everything from having a family to making a livable income in the name of science. We could choose to go work at jobs where we would make a lot more money than we do, but most of us need to feel like we’re making the world a better place at night when we lay our head down. After fourteen years of proudly bearing these labels, I continue to be humbled by those around me who work incessantly, chasing the shrinking pot of federal funding that barely guarantees us full-time work, let alone enough money to pay off our imploding student debt….yet maybe what matters most is not what I know but how I am perceived. I guess I’ll show up in a Mickey Mouse suit for that Town Hall talk and leave the suit at home.

Student Post: Communication and Likability



Arjun is interested in building biological machines to address the challenges posed to crops by a rapidly changing agricultural environment. He designs and builds control systems that allow him to engineer plants that are more robust to environmental changes.

In last week’s class we discussed something I think about a lot, namely how are scientists perceived by the general public. As part of the discussion we saw a graph that I thought was particularly interesting. Every point on the graph was a profession and the axes were competence and a metric

for likability. We saw that researchers sit close to lawyers on this graph, in the quadrant that represented competent but not likable, while teachers, doctors and nurses sat in the quadrant of competent and likable. So that got me thinking about what exactly it was that made teachers, doctors and nurses more likable than researchers.
I think that the reason for this is that professions like teachers or doctors are perceived to be service professions whereas researchers, much like layers, are perceived by the general public to be professions that do not contribute to society as a whole. Arguably some researchers make a massive positive impact on society, such as the discovery of antibiotics. But I think that for the average person, all the positive feelings that go along with getting healed by an antibiotic is associated with the person that gives it to them, namely the doctor or nurse rather than the researcher. Part of the problem here is that researchers do a pretty good job of communicating their work to their fellow researchers, but not to the public in general and so an average person has no idea the amount of time and sacrifice it took to develop those hugely impactful advances.

Another aspect of this communication gap is the way we communicate the science. As researchers the aspects of the work we do that is exciting to us or the field we work in is generally how it moves the field as a whole forwards. The truths we uncovered about previously unknown phenomena. For the average person this is just boring errata. To truly demonstrate worth in the eyes of the public I think that scientists need to contextualize their work in the eyes of the public. The most publicly celebrated scientists in the life sciences tend to be ones that discovered therapeutics, things that had a very tangible effect on people's lives. However, no science comes from the ether. It is all built on decades of fundamental research. But someone not in the field cannot be expected to know that. So I believe it is the responsibility of researchers to communicate the relevance of their science to the everyday lives of the general public. It's only when this happens that people will have the correct frame of reference to properly appreciate the invaluable place that researchers occupy in society.

Student Post: Learning to sacrifice perfect

scientific accuracy for fun

Will uses statistics and mathematics to study how the abundance of freshwater fishes relates to river flow in large, dam-regulated rivers in the American southwest. From these relationships, he aims to improve dam management for sustaining freshwater ecosystems without affecting dams' roles in providing water for human use.

How do we engage the public in scientific discussion? This question has been on my mind recently, and not just because of the ENGAGE seminar. I've been working on designing a board game to improve people's understanding of climate change. I recently went to Washington, DC to demonstrate our board game on climate change adaptation at the Smithsonian Museum of Natural History and engage museum visitors in climate change discussion. Many of the visitors were children and as I found out, the words "ocean acidification" held very little meaning to them. However, telling them that ocean acidification will mean less of their favorite fish dish was much more successful in bringing them into the game. I didn't fully realize it at the time, but I was learning about the interplay between accuracy and excitement, which was one of the topics of this week's reading.

This week, we were assigned an excerpt from Randy Olson's *Dont Be Such a Scientist* called "Accuracy versus Boredom". The excerpt included a comparison of two movies on global warming with the same executive producer: "An Inconvenient Truth" and "Too Hot Not to Handle". You have probably heard of the former, starring Al Gore, but what about the latter one, which was released just a month prior? I'll admit, I had never heard of "Too Hot Not to Handle", and I work in the environmental sciences! As the excerpt goes on to say, "Too Hot Not to Handle" was chock-full of scientific accuracy and detail, while "An Inconvenient Truth" focused on the storytelling. That is not to say that "An Inconvenient Truth" had no facts (in fact, there were charts and figures galore), nor that "Too Hot Not to Handle" had no story (it premiered on HBO, which is full of gripping dramas and films). However, the different focuses led to very different movies, with very different receptions. While "An Inconvenient Truth" may not have convinced every individual of the consequences of climate change, it continues to drive conversation about our role as environmental stewards. The

lesson that Olson illustrates is that while scientific accuracy is important, being bogged down in details is a sure-fire way to lose the general populace.

I already knew that games have the potential to better engage people in discussing science. People play games to have fun and board games in particular create a space for people to interact with each other within the game and to discuss after the game. However, Olson's segment on accuracy versus boredom showed me the underlying cause of what I find so compelling about games. In hindsight, balancing accuracy versus engagement is core to designing successful educational games. The links between ocean acidification and the health of marine fish populations are way more complex than a simple number on a piece of cardboard. Droughts don't just get half as severe because you saw them coming and prepared for them ahead of time. However, these constructs (although not wholly accurate) create ways for people to become invested and engaged in the outcomes of their actions, which is key in starting the conversation about the underlying science. After all, what good is scientific accuracy if no one is there to hear about it?

Student Post: Play a game with me

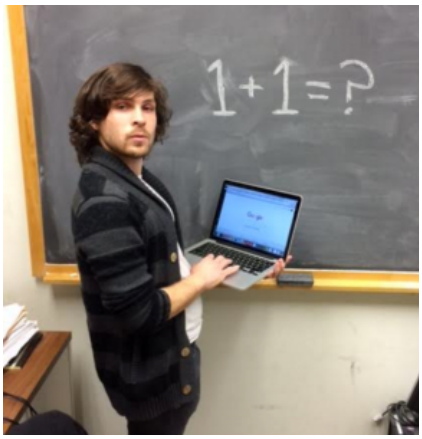
Roxanne is a 5th year PhD student in the Civil & Environmental Engineering Department at the University of Washington. There, she answers the call of the sea. Roxanne grew up vacationing at the New Jersey shore, started rowing competitively in high school (and continues today at Lake Union Crew), and now studies how breaking waves impact the coastal environment.

Think of the last time you learned to play a new game. Whether you read the directions yourself or a friend taught you the rules, you likely started playing without much strategy. As the game progressed, you gained a better understanding of how the rules actually influence your decisions of play. By the end, you had built an arsenal of tactics and were excited to test your skills again. (At least this is what happens to me when I play a well-crafted game for the first time.)

A successful science talk captivates its audience in much the same way as a great game enthralls its players. Last week, Kim Martini, PhD in Oceanography and blogger for Deep Sea News, spoke with our ENGAGE class about how to attract and entertain your audience. Her advice? Present your “cool idea” using only the necessary facts. Don’t overwhelm or obscure your “cool idea” with too many facts. Instead, frame your “cool idea” with a limited number of facts that highlight your main point. If you do your job well, the audience will be interested in hearing more. Ok, great! But how do I do that? How do I weed through all the facts?

Luckily, Kim had some advice about that too. Edit without apology. This advice really resonated with me. I have two post-it notes stuck to the edge of my computer monitor. The first says, “Write like a 7th grader. It’s ok for now.” The second says, “Clear – Concise – Complete.” I am not someone who can formulate beautifully crafted sentences in my head and have them come out on paper. I am wordy. I often follow tangents, and I tend to give you all the details before telling you why they matter. In my mind, the step from one point to the next is obvious. However, my audience can’t read my mind, so I need to edit without apology. We shall see how well I am able to employ this strategy at my Town Hall Seattle talk this spring. Hopefully, my audience will feel empowered to ask questions and be excited to learn more. In other words, they will want to play the game with me again!

Student Post: Presentation with a capital P



Chris Baldwin is a physics graduate student who studies how competition between the constituents of large groups and/or objects affects their bulk behavior. He uses numerical simulations and (when possible) pen-and-paper calculations to study simple examples in as much detail as possible.

So last week, Dr. Melissa Clarkson came to speak to us about how to create a Presentation. As in not just slides, but a Presentation, with a capital P. She gave us a lot of advice about “storyboarding”, basically sketching out what you want your talk to be like before you even try to put anything into slides. I think the real lesson there is to shift your focus from the information you want to convey to the story you want to tell (which should definitely have a lot of content to it). But the most catching part of her talk (her “sound bite”, if you will), was when she said: “Your slides are not the presentation, you are the presentation”.

I know that this course is about communicating science to the public, and so Melissa probably said this in the context of having a non-scientific audience, but really, this is great advice even for the most technical talk you can imagine. There’s probably even all sorts of metaphors about life in that statement (“my job, like the slides, does not define me; my personality defines me!”).

But anyway, I’ve actually been exposed to this same idea over the past year or so, even though I wasn’t aware of it. I’ve been going to a lot of “summer schools” and “lecture series” lately. They’re basically scientific talks that are supposed to be more pedagogical and less about communicating results. The ones that I’ve gone to have been very hit-or-miss. Some were inspiring and fascinating and rekindled my excitement, but others were painfully interminable. I think back to what made the good lectures good and the bad lectures bad, and although I didn’t realize this at the time, it often had more to do with how engaging the speaker was. I need a Presentation to grab my attention, not just slides with interesting information.

And the thing is, a Presentation doesn’t have to be gimmicky. None of the good speakers at my summer schools were anything less than very serious about what they were doing. But parts of their personalities showed, and that was what kept me listening. One speaker was practically bouncing off the walls with enthusiasm over his subject material, all while giving us technical details about certain statistical simulations. You can’t not pay attention to someone like that. Others had this sort of calm, conversational presence that made me think “Wow, these people really know their stuff, I should listen to them!”. So giving a good Presentation isn’t actually about charisma or sociability (although I’m sure those help). It’s about conveying what this all means to you and how you think about it.

I think it's just human nature to be more engaged by people than by facts. That's what I'm taking away from this idea of a Presentation. At my town hall talk, I plan to just talk about the field of research I'm involved in, and not mention my specific research at all. Still, I want to convey a sense of who I am and how I relate to this work. Not by just listing things like my hometown and my favorite color and three of my hobbies, but by genuinely being myself on that stage.

Student Post: For Those of You Who Don't Know

Julia Kelson studies ancient global warming events in order to better predict how our modern climate will respond to the rapid increase in atmospheric carbon dioxide. She measures what the climate was like in the ancient past using the chemical composition of preserved ancient soils and lakes.

For those readers who don't already know, every ENGAGE class begins with in improvisation game. On Wednesday February 3, ENGAGERS started with a particularly amusing game where we tried to usurp the chair from a fellow ENGAGER who was already comfortably seated. Manipulations used to usurp the chair included: snakes on a plane, anecdotal horror stories of bad posture, feigned injuries and illnesses, and, of course, an over-enthusiastic but ill-experience hair dresser, Roxanne, who wanted to turn Chris's long locks into a green mohawk. The room was burgeoning with witty ideas and laughter as the blossoming communicators (ENGAGERS) flaunted their aptitude toward improvisation.

Now, did I alienate you as a reader with my first line of this blog post? Did you immediately want to stop reading? If you kept reading, did that first paragraph seem like an overly long explanation of an inside joke that you were not a part of? Did I offer too much unnecessary detail and not enough entertainment?

It's surprisingly easy to make the mistake of alienating your audience while trying to explain details of your research, especially if you think that some members of the audience may already understand what you're about to explain. Even the seemingly flawless hosts of a premier podcast, RadioLab, accidentally alienated some listeners in an episode that we listened to as an assignment for class. When communicating science to the public, we should try to join the learning voyage with our audience so that the whole room shares an experience. It doesn't hurt to explain concepts that your audience may already know. As Randy Olsen in *Don't Be Such A Scientist* says, no one ever complains about listening to a talk that makes them feel smart and teaches them something. And then, we should consider sacrificing some of our excruciatingly accurate detail to make sure that we entertain the audience. If the audience feels alienated, overwhelmed, and stops paying attention, then even the best science will end up wasted, like expensive Draino that you buy just to dump down the drain.

Student Post: Distilling for the Sake of the Story

Jason James is a PhD student in the UW School of Environmental and Forest Sciences studying soil –the excited skin of the earth. His research delves deep into soil, examining how carbon can be transferred from the soil to groundwater, streams, and rivers or to the atmosphere.

Last week in class, we presented storyboards of our Town Hall presentations. This experience was invaluable for providing feedback on our storytelling, and, in my case, led to immediate plans to change not only what, but also how, I will present at Town Hall. As I described my presentation to Arjun and Leah, I tossed one of my storyboard slides aside as soon as I reached it, realizing in the moment that it was far too technical and unnecessary to make my point to a public audience.

This is a delicate tension in any public presentation. Do you describe recent disagreements within your scientific discipline that motivate your research and chronicle the intricacies of a method that you personally find fascinating? Or do you stick to the major highlights of your field that have the most direct relevance to the public? There is no easy answer, of course, as I recently learned when I gave a seminar presentation on the carbon cycle.

To set the scene, imagine a musty old lecture hall, complete with squeaky seats with permanently affixed desks in which students with majors ranging from Japanese to Landscape Architecture to Environmental Resource Management wait for your presentation to begin. You want to communicate

your excitement about your research and how it might – just might – alter how soil fits within the global carbon cycle. You probably would not make the choice that I made –to talk about how a rare isotope of carbon is used to estimate the age of carbon compounds.

In retrospect, this was the wrong choice. The fact that this is a fascinating method that has been used in fields ranging from archaeology to forensic science was not enough for it to be included in that presentation. Two of the questions at the end of the seminar focused on confusion with the details of the method rather than essential concepts related to soils and carbon cycling. The details muddied the water instead of contributing to the presentation. It simply was not a necessary part of the story – a situation in which it would have been better to distill just the essential points without going into detail.

In fact, this was the take home message from class last week. Sometimes you need to distill complicated scientific topics down to more simple concepts, not only for the good of your audience, but for the good of the story you are trying to tell.

Student Post: Overcoming stage fright and the dreaded Q&A session

Dr. Fowler is a public health veterinarian and current PhD student specializing in the field of occupational safety and health at the University Of Washington School Of Public Health in the Department of Environmental and Occupational Health Sciences. Through her PhD work Dr. Fowler hopes to hone her skills in One Health research by characterizing and addressing the occupational hazards experienced by animal workers.

This week in class we learned how to conquer our fears of public speaking. As a class we populated a laundry list of behaviors and bad habits we tend to exhibit or conduct when giving presentations. For some, changes in their cadence were noticeable when speaking to the public, while others got the shakes or completely spaced out mid-sentence. Also, the dreaded filler word “umm” appeared to affect us all uniformly. Once our list was complete we again worked as a class to share our proposed solutions for addressing these issues. Overall, we agreed that practice (and a little bit of confidence) really does make perfect and that in time these bad habits would all soon be extinct.

The second hour of class was spent conquering one of my biggest fears, the Q&A session. Before launching into any application we discussed the PREP method for answering questions. The steps in this method are stated below:

P >Point: “The point I want to make is …….” R >Reason: The reason I say this is ……” E >Example: “For example ……” or “In my experience ……..” P >Point: “In summary my point is …….”

Shortly after learning this approach we moved quickly to application via two rounds of questioning. One-by-one we each went in front of the “firing squad”, i.e. our instructor Robin armed with her random list of questions, and answered each question to the best of our ability using this method. Shelley held us accountable in regards to our use (or overuse really) of the filler word umm by counting the number of times we used the word while answering our questions. The first round was pretty easy, with ENGAGERs answering questions regarding the best tools needed during a zombie apocalypse, the best superpower to possess, and whether cats or dogs were better. The second round however possessed some doozies including questions on homelessness and capital punishment. Though the questions in this second round were significantly harder than the first, they helped to cement in us the benefits of the PREP approach when answering ANY question.

This activity was by far my favorite activity of the whole quarter to date as I personally struggle with the Q&A session. The feedback I received while answering my questions each round reminded me of the importance of taking the time to think before attempting to answer even the silliest of

questions. Now that I am equipped with the tools needed to answer questions from any audience, I look forward to the opportunity to apply these methods at my next presentation.

The last hour of class was spent discussing slide design. Due to the scheduling shift, with class occurring an hour later than usual, a number of ENGAGERs including myself missed this last session. Thankfully, our trusty instructors recorded this lesson creating key lasting materials that can be referenced for years to come.

Student Post: Your inner jazz improviser

Herring are more than a canned or pickled snack. This fish is a critical source of food for other animals and income for fishing communities. John Trochta, a masters student in the School of Aquatic and Fishery Sciences, is motivated to study its changing abundance in the ocean.

Nothing captivates me quite like improvised jazz. The melodic creativity that flows from the improviser gives me chills, such a cool feeling… As an undergraduate back in Michigan, I was fortunate to be surrounded by many improvisers when I played bass in the university jazz band. One member, the drummer, REALLY moved everyone with his improv skills. He always electrified the rest of the band and the audience with his solos (if you want a sample, check out the band's rendition of the big band classic "Sing, Sing, Sing," https://www.youtube.com/watch?v=piH78LjToaw – his solo

starts at 4:20). The music he unfurled through the snaps, pops, and rolls from his drum set made you forget that this was all an impromptu act. His sound exuded ability, confidence, focus, and fast thinking.

Improvised jazz is not unlike Q&A at a public talk. To me, they are the same process. You are given a cue which you process to instinctively craft a response. An improvising musician is given a chord progression and rhythm to craft some killer tune. A speaker is given a question on a specific idea or topic from their subject matter to craft some killer answer. Easy, right? Ha, that is the scenario we all wish. Killer performances, talks or concerts, can hinge on the improvised bits. You don't have to do them right (because 'right' is subjective anyway), you just have to do them well. Doing them well comes from technique and confidence, which comes from practice, and learning and understanding your material till it becomes reflex.

Fortunately for us graduate students, we spend an obscene amount of time learning and understanding our material. However, the other major bit I haven't mentioned is communicating it. Alas, ENGAGE equipped us with another communication technique: PREP (see Dr. Fowler's post). PREP is simple, direct, and accomplishes what speakers must be most concise and direct about: answers to questions. Just like jazz improvisers learn and follow fail-proof musical techniques, we ENGAGErs have learned and will now follow scientific communication techniques to excel in our "final performance." All that's left is the practice. Thankfully we have the last three weeks of quarter being for practice.

Best of luck, ENGAGErs. May we all exude the ability and confidence of the jazz improviser.

Student Post: The Art of Presentation

Elisa Bonnin studies the ratio of magnesium to calcium in the shells of a type of plankton called foraminifera, which is one of the things we use to figure out what the temperature of the ocean was like thousands of years ago. Because things other than temperature can affect the amount of magnesium in these shells, her lab captures living foraminifera and grows them in a controlled environment, so

that they can understand how things like salinity and pH change this ratio.

Our final class before our practice talks focused on presentation, on how to make presentations that catch the audience's attention in all the right ways. We learned how things like color, contrast, and orientation can affect the audience's attention, which really struck me, since many of them were not things that I had considered before. It's often said that 90% of our communication is nonverbal, and I'm beginning to think that that applies not only to our everyday conversations, but to our talks, presentations, and posters as well, both in an academic setting and to the general public.

It isn't just words. As a writer, that's one of the things that stuck out the most to me. I'm good with words. I'm good at laying them out on a page and making something say what I want to say, but I've always struggled with the delivery. When giving a talk, it almost seems as if the actual language you use is secondary—still important, but *secondary*—to the method by which the information is conveyed. So many things go into whether or not your talk works and whether you sound credible, and it isn't just about your vocabulary. It's the tone of your voice, the way that you face the audience, what you do with your hands. It's what you wear, although that might not be *as* important in the sciences, how you act, how you carry yourself. It's whether you breathe between sentences or keep talking, whether your voice stays steady or trails off, whether you slouch or carry yourself with pride.

And when it comes to your presentation, it's the same thing. The actual content of the presentation is important, but secondary to the way you present it. You could have the most well-informed PowerPoint presentation in the world and still have the delivery fail if your audience doesn't ultimately understand it. Making sure your audience understands your presentation isn't just throwing more words at them. It's using the right colors, the right font, the right font size, to making sure that important things aren't lost in the noise and the background, that decorative elements, if present, don't detract from the message. It's complicated and difficult to do right, and a hundred different people have a hundred different ways of doing it.

But it isn't impossible. Presentation is as much an art as it is a science, difficult to describe and quantify, but that doesn't mean it's not something that can be learned with practice. Some people are lucky enough that presenting information comes naturally to them, but for people like myself who aren't quite as blessed, gaining these skills comes with practice. It comes with putting yourself in front of an audience time and time again, until you can deliver a talk, present a poster, or even write a blog post in a way that is engaging to the audience, that gives them the information they need without talking down to them or going over their heads, and that leaves them feeling confident about the presenter's competence.

In my case, that means signing up for talks even when it's the last thing that I want to do sometimes and hoping that with practice, my stage fright starts to disappear and I become more confident in myself and my message. I've seen it happening slowly, seen the first results of this practice and the lessons learned in this ENGAGE class in my recent master's defense, and I'm confident that I'll see the results of this class at my Town Hall talk in April and in all of the talks and presentations beyond.

Student Post: This isn't Rockets Science… Oh wait…

Leah Johnson is a PhD student in the School of Oceanography and the Applied Physics Lab. She is interested in regions of the upper ocean where horizontal changes in water density occur over very short distances, called ocean fronts. Small density fronts are ubiquitous in the upper ocean and therefore have large impacts on the way the ocean and atmosphere interact.

Rocket science is the epitome of a 'difficult to understand' science. So when someone spends their entire graduate career becoming an expert in rocket science, turning around and explaining it to 300 new college students should be a breeze in comparison, right? Wrong. Our last guest speaker (Toby Smith), who obtained his doctorate in astrophysics at UW, showed us that it could take many more years to perfect teaching the basics of rocket science than it takes to learn about and obtain a PhD on that same subject.

In order to share our knowledge of science with others, it is essential to learn how to let go of the equations that are so near and dear to our little scientist hearts. We grow very fond of and attached to equations that describe our research, such as chemical reactions found in biology or geology, or math that describes an ecological system, or like what I study, the equations of fluid motions used to understand the atmosphere and ocean. These equations are our tools, allowing us to communicate results to others in our field and, ultimately, achieve a deep understanding of our subjects. So when it comes time to turn around and communicate this research with a family member or friend or

stranger, these equations are fresh in our repertoire, tools at the ready to be used to describe our work. But most likely this approach results in a blank stare back at us.

The idea of leaving behind those treasured equations was engrained in us from our last quest speaker who, very candidly, shared his tries and tribulations of how to explain rocket science. His first attempt at teaching rocket science displayed his expertise in astrophysics and LaTeX programming along with an obvious lack of expertise in teaching first year college students. Through the years, his numbers and symbols were replaced with images and cartoons, but he didn't want to give up equations all together. This is what I thought was the most interesting part of the discussion: What is the simplest mathematical expression that represents the dynamics, yet leaves people with a deep understanding of how rockets are transported from earth to the moon. The speaker referred to the importance of providing students with a 'body feel' for the physics at play. To me, this meant providing people with a positive association of the dynamics that will linger longer than equations full of numbers and Greek symbols.

The ideas imbedded in the guest presentation will remain with me as I move forward with my own communication ventures. The passion we have for our research isn't enough to inspire others. Sharing this passion requires an equal amount of work and care to sort through, distill and rethink the individual components of our work that will allow others to obtain a "body feel" for these hard to grasp concepts. Just as our speaker is still working to perfect his lesson on rocket science, I anticipate this journey to be a long and ongoing process throughout my career.