Student Post: Hoping to Share Some Science

Alan Jamison is a PhD candidate in physics at the University of Washington. He examines the behavior of carefully isolated atoms to look deeply into the secrets of the universe.

Being a physicist looks like a dreadful, thankless job. Through all the years of building baroque machines, dealing with equipment failures, and hunting some tiny source of noise for days, the big picture of my research keeps my spirits high. The underlying principles I study are so beautiful that I want to share them with others. What do I study? Well, I use a Bose-Einstein condensate contrast interferometer to test quantum electrodynamics as well as…

So, you see there's a small problem with my aspirations: The longer I've been in grad school, the worse I've become at explaining physics to nonphysicists. Currently in my sixth year, I fear this condition is nearing terminal. I wasn't always such a bad communicator. It used to be that friends and family would come to me when they heard of some new sciency thing. They'd ask me to explain what it was about and how it works. They've seen how grad school has turned me into a head-spinning fountain of jargon and so, gradually, they've stopped asking.

In college I was part of a group that went to local elementary schools to talk to kids about astronomy. I relished it and you could see the joy in the kids' faces. A few months ago my nieces brought me to their sixth grade class to talk about what I do. I showed some cool pictures of lasers, and things were going well. Then I opened my mouth to tell them what I do. And I froze. How could I possibly

explain what I do to these kids when my own colleagues often can't follow all the details? As I limped through, I realized the problem was not that sixth graders are unprepared to learn physics. I had allowed myself to be so mired in minutiae that I could no longer talk about the big, beautiful ideas underlying the minutiae.

I said one good thing about the physics I study, and the kids all got it. It even stuck with them into the next week. This made it perfectly clear: The problem was with how I told, not with how they listened. I'm taking this class, because I want to be a better explainer. I want to be able to tell sixth graders about the wonders of physics and have more than one lucky turn of phrase excite them.

In my distant past I taught high school physics and creative writing. The ideas of the first day of class resonated well with my inner creative writing teacher, someone I've not heard from in a long time. The idea that a talk about science can, in fact *should*, be structured as a story makes perfect sense to him. However, I never would have thought of it because that's not how you see talks structured. Trying to see my research as a story is hard, but it's clear this will make me a better communicator and a better researcher. The improvisation games we played in the first class were like verbal versions of the free-writing exercises I used to give my students to help them loosen up their writing. This class seems like just the thing to make me a better science advocate and educator.

Student Post: Teaching Awkward Scientists to be Fun

and Engaging in Public

Natalie Footen is a graduate student in the School of Environmental and Forest Sciences at UW, studying parasitic plants in Pacific Northwest prairie ecosystems. Her career goal is to teach ecology, horticulture, and ecological restoration at the university level.

My name is Natalie, and I am a scientist. I am a graduate student and I hope someday to have the occupation that allows me to do research and to teach: I want to be a professor. Unfortunately, there are a few tiny roadblocks in my way, of which one of the most serious is my fear of public speaking. And my definition of “public” is extremely broad. It includes talking to someone I don’t know (even just one person), talking to people I do know in a formal setting (like giving a lecture), and of course talking to a large group of people I don’t know. Over the course of my studies I have taken every opportunity to speak in public, in hopes that I might do it enough times that my stage fright will subside, but so far I’ve seen very slow progress.

So I decided that the Engage seminar would be a good idea for me, not only to improve my ability to speak in public in general, but also to help me become a better educator. I am genuinely excited about my field of study (ecology) and about teaching, and my hope is to be able to convey that excitement and enthusiasm to my students. I think most people in graduate school had a teacher like that who helped them see how cool their subject could be, and I have been lucky enough to have several of those teachers in my life.

In our first class, we really just got loosened up and got to know each other. The class was structured in such a way that it felt very informal and thus much less scary. One of the main themes was storytelling. It makes sense that telling a story is a great way to communicate science: everyone loves a good story. And at a basic level, scientific inquiry follows a story-type format: We start out

with a question or problem we want to solve (the quest!), we gather evidence (the journey), and we (hopefully) answer our question (the exciting conclusion!).

We played some “getting to know you” games and then moved on to some exercises that focused on on-the-spot creativity. It felt much like an acting class, or what I assume an acting class would be like, since I have never taken one. Like I said, I’m a scientist. But the point was to develop the skills to be able to answer unexpected questions or deal with unforeseen problems that could come up during a talk (for example, if your visual aids are not working). At the end of class, I honestly felt like I might be able to figure this public speaking thing out. I know it will still take a lot of practice, but to have this direction in the process will be a great asset.

Student Post: Overcoming the Public Speaking Butterflies

Erik Budsberg is working on a Masters at the University of Washington in the School of Environmental and Forest Sciences. His current work focuses on how a new generation of biofuels made from poplar and willow trees could affect the environment.

Public speaking…what is it about those two words together that cause the butterflies to flutter in many peoples stomachs? It is something I have always wondered about because I too am one of those people who to suffer from Butterfly-Stomach-Itis (aka BSI) when presenting. Therefore I have made it a personal goal to become comfortable giving public talks by the time grad school is over.

To look for answers I started taking mental notes on all presentations I gave and what I was feeling during them. Luckily the first year of grad school provided plenty of presentation opportunities. I worked hard and prepared for each one and by the end of Spring quarter last year I was feeling confident in public speaking with only a little bit of BSI here and there. This was a good sign for me. Maybe all I needed to do was prepare and practice for presentations (which is not something I did much in the past) and my speeches would go smoothly? It sure seemed like I had a good new strategy, but then it came time for my brother's wedding for which I was assigned the prestigious duty of being the best man.

I knew that a speech would be required during the reception and prepared diligently to deliver it to the 120+ guest list. If things went well this would be my public speaking crowning achievement. However life had a different idea. During the wedding rehearsal it came to light that the friend of my brother who was scheduled to be the officiant was not going to be able to fulfill his duty. Luckily a few months prior I had gotten ordained on a bet at a friend's bachelor party. Wanting to make sure my brother had a successful wedding (one that ended in a marriage), I stepped in as the officiant. Unfortunately due to all the other events that had to happen before the ceremony the next day, I only had two hours to write and practice my speech (so much for my new strategy). When it came time for the ceremony, I was feeling unprepared and the BSI came back with a vengeance, but I pulled it together and got through it. Afterwards everyone told me the ceremony went well, but personally I knew it could have gone better if I had been more comfortable up at the altar. It was this experience though that led to another realization, you cannot prepare for all presentations and situations. Something will inevitably arise and you need to be able to improv on the spot.

It is these two very different skills, preparing and improving, that I hope to gain much more experience with during this class. Being able to prepare and practice a presentation that is well designed for the given audience will help me take the spotlight with confidence, but all this preparation only makes up a part of what is required for a great and confident presentation. I need to feel comfortable in my ability to go with the flow and handle all situations as they arise. This class seems to align with my needs and I look forward to working on all of this and other presentation strategies as the quarter progresses.

Student Post: Reflections From an Ex-theatre Geek

Adam Campbell is a PhD student in Earth and Space Sciences at the University of Washington. He studies the ancient Snowball Earth and where life survived during its extreme past. He enjoys plaid shirts and strong coffee.

For me, last week's class was like visiting an old friend. When I was in high school I didn't spend my time in the lab or buried in science textbooks, I mostly spent my extra time in the theatre. I acted, directed, designed lighting, managed the stage… you name it, I did it. It was a great time. We played improv games, told stories and got to act crazy and weird. It was a really liberating time for me.

Aomawa Shields, our guest speaker this week, earned an MFA in theater before pursuing her PhD in astronomy. I suppose my story is little bit like Aomawa's in reverse, because when I was in college I discovered math and physics. And while I was still acting while in college, science took over as my passion. Now that I am in grad school, I look back and sometimes miss my time spent in the theatre. But I feel like it left me with some great skills that I use everyday as a scientist. As far as presenting goes, I learned how to enunciate my words while I am speaking. I learned to fill a room with my voice so that everyone can listen attentively. But there are also more subtle things, varying the pacing and tone of your speech. And learning the impact that a pause or silence can have. It also means preparing your body, to present yourself as open and confident. Aomawa lead us through some

great exercises to find our own Superwomanpose. Which reminded me of this simple, but far less elegant maxim from a high school acting coach, “Shoulders back, tits out.”

Aomawa gave some great advice at the end of the class which was to take a voice acting class if you get the chance. In addition, I would also recommend taking an oral communications class. I took one in college and I think it greatly improved my ability to give good talks. And it’s because the focus of the class isn’t about the content of your presentation, but rather your ability to communicate the information. Which is often not the feedback you’ll be getting from your peers when you give a talk, even a practice talk. One thing Randy Olson spoke about in his book, *Don’t Be Such a Scientist*, is that as scientists, when we see a talk we are not willing to let the sin of making an error slip past us. We quickly correct each other. However, we let the equal sin of having a confusing or boring presentations, let go right past us, unchallenged and unchecked.

I would now expect that next time you watch someone’s practice talk, to make a comment about presentation style. Tell them if it’s boring or doesn’t flow right. Tell them if the story isn’t captivating. But more importantly, help them to fix it.

Student Post: Engaging an Audience: Combating Bad

Science Communication

Meg Smith is a PhD student in Earth & Space Sciences and Astrobiology at the University of Washington. She studies the atmosphere of Mars and the very early Earth. She is generally interested in helping to answer the question: what makes a planet habitable?

What makes the stereotypical scientist such a terrible communicator? Is it the overwhelming use of discipline-specific jargon? Is it the inability to recognize when too much detail is being given? Is it the rapid, incoherent speech and fidgety motions of a nervous speaker? Unfortunately oftentimes all of these behaviors come together in the perfect storm of bad scientific communication…

Last week I attended a science seminar that made me want to pull my hair out. The speaker's hour-long talk was a deluge of jargon and detail. Theoretically, I should have known the general topic well enough to follow along, but I felt completely lost after the first minute. Fifty-five minutes into his talk, the speaker finally noted that time was running low. I was relieved to think the talk would soon be over, but I found myself horrified when he proceeded to announce that because time was low he was going to increase the pace in order to fit in the many things he had left to say. Audible sighs of exasperation were heard across the room. If only this speaker had attended our "Engage" seminar this last week.

This past week, our guest speaker was Aomawa Shields, a PhD Candidate in the UW Astronomy department. She used her training in acting and theater to help us become aware of ways that the physical presence of a speaker can impact the effectiveness of a talk. Aomawa led us through several exercises that combined breathing control, voice control, and body movements. As someone who spends all her days sitting in an office chair, communicating science either over email or across the table, it felt a bit odd to me. And maybe that's why I personally get nervous for talks. The whole situation seems abnormal to me. However, armed with Aomawa's tips, I think I'll be better off for future talks. For example, Aomawa recommended standing in a "powerful position" immediately before and during a talk. She also recommended focusing on using ones nerves to help fuel the energy in a talk, rather than let the nerves hinder its progress. I realize now that when speakers use

their body and words to command the attention of the audience, all of the “oddness” of the experience seems to melt away. When the audience is engaged, the battle has been won.

The next time I give a talk, I’m going to remember Aomawa’s lessons. The broad interpretation I made from her lessons is that a talk should always be *delivered*; not *given*. The former word implies taking care to make sure the audience receives the talk and understands its message, whereas the latter word implies a more careless presentation of the talk. For example, a speaker should project his or her voice across the room and make use of the stage so that all members of the audience can be part of the talk. If I can remember this, I bet I will avoid having to hear any sighs from audience members at my future talks.

Student Post: Communicating Science in English

Derya Dilmen is a third year PhD student in Earth and Space Sciences at the University of Washington, where she studies tsunami computer modeling and mapping of tsunami effects.

The hardest thing in my life has always been to explain myself to others. When I was in college in Turkey, (yes, I am Turkish, not turkey the food) my classes were taught in English since I studied at an ABET accredited university. I spent my first year in college trying to understand physics professors who finished their PhDs in the U.S. and the English technical terms they used. There was

no time for science communication or for oral presentations. Since then, science has been hard for me to explain to non-scientists. I loved written exams, hated oral ones. I prefer to hide in my laboratory rather than explain my new awesome innovations to people. I always found a way to get out of giving oral presentations, or I gave bad ones, until graduate school.

I applied to the graduate school at the University of Washington and somehow I got accepted. My first year in US, I struggled not only with giving scientific presentations in English, but also making daily conversation with my friends. I am still shy due to weird looks I get when my friends didn't understand what I meant. This may also be the reason I hang out with international students who understand my situation and tolerate my grammar and pronunciation mistakes.

During the first year of graduate school, I decided to give an oral presentation to my friends to practice for my preliminary exam. That was the moment that I got it: people don't understand anything about what I thought was a beautiful and clear tsunami inundation map. I realized that it was my responsibility to publish, advertise, and make sure people understand, but I failed.

My failure helped me realize my problem and motivated me to solve it. With this motivation, I searched for scientific communication classes at UW and I applied to the Engage seminar. It is very challenging for me but fun at the same time. For example, this week we learned how we can use our voice and posture more effectively during oral presentations. The guest speaker has an MFA in theater and is now earning her PhD. at Department of Astronomy at UW, and she taught us relaxation techniques to help with shaping our voice and posture. Lessons like this will surely help me to improve my scientific presentation skills.

Student Post: Adventures in

Science Communication

Sara Bender is a PhD candidate in the School of Oceanography at the University of Washington. Her research focuses on the growth and success of microscopic marine organisms that live in miniature glass houses (Also Known As: Diatoms). While Sara's scientific adventures have taken her across the world's oceans and back again, her current project focuses on our own backyard: the coastal waters of the Pacific Northwest.

"My research is focused on an organism that is invisible to the human eye, but when it blooms, you can see it from space."

This was my "sound bite" developed for week 3 of the ENGAGE course. As we learned in class, a sound bite must be short, create "instant intrigue", be note-worthy, and capture the audience's attention. At the beginning of class, each ENGAGE student had to deliver several sound bites related to our specific research projects. Then, one by one, the class discussed what worked and did not work with the delivery and/or the content. It was fascinating to hear little vignettes from everyone's projects: "salt from Mars," "setting things on fire," and "a parasitic Prairie organism" were a few sound bites that stuck with me. It was a fun activity with lots of laughs, and a fantastic reminder that we all come from diverse scientific backgrounds. In fact, our interactions with one another in class could make for a good social experiment: What happens when an astrophysicist has to problem-solve with a physical oceanographer and a biologist? This course is a cross-disciplinary adventure into the unknown- to say the least.

Admittedly, developing a sound bite was more difficult than expected. In graduate school we are trained to present our research methodically: "My question is x, my hypothesis is y, and my conclusion from this research is z." But, since day one of the course this framework has been flipped upside down and turned inside out. Rather than layout the scientific method for my audience, I now know that there has to be excitement, adventure, and a plot! I need to grab my audience's [short] attention span and hook them from the get-go (similar to a 30 second TV commercial).

Throughout this process, I have had to whittle my research down into its most basic form; a task that is difficult for someone who spends 10 hours a day with her nose in jargon-filled research papers.

But the product that has emerged from this iterative approach is multiple sound bites that I can now expand on to form a story of my research. A story that will carry the audience from start to finish: from microscopic organisms to blooms in space. As scientists, we are trained to get lost in the details, but as communicators, we are trained to “think big” and place the details aside to get our bigger message across. Why is my research so exciting and why should you, the audience member, care?

Thus far, the ENGAGE course has been a lot of fun, and it has given me renewed interest in my own research project. I am excited for what’s on the horizon, and I have high hopes for the weeks to come. Stay tuned.

Student Post: Some Secrets to the Success of Science Centers

Laura Newcomb is a PhD student in the department of biology at the University of Washington studying why, at the end of the summer, large patches of mussels disappear from our shores. She explores how possible culprits for this weakening, elevated temperature and pCO_2, may reduce the attachment strength of mussels on rocky shores and aquaculture lines.

School trips to the science museum were always the best. Practically speaking, class field trips are something I, and I would argue most people, look forward to. They present a chance to miss a formal day of school, get to sit on the bus with friends, and go somewhere new. But that somewhere could range from the super interesting action packed day of the science museum / science center filled with interactive exhibits and cool facts to the more seriousness and but culture enriching trip to an art museum. Maybe that is why I grew up to be a scientist and not an art historian, but there just seemed to be something magical about science centers.

I felt as though I got a glimpse of what made those science centers / museums so successful during our visit from Stephanie from the Pacific Science Center this week. One of the key messages I took away from her visit was that learning information is personal. Every person learns differently by connecting new information with information they already know. As an educator, I need to create entrance points from what people already know to allow them to access new information. That is what some of these exhibits did so well that the art museum failed to do – they related information to me in a way that I could connect to. I learned about reaction time by testing my own reaction time, and then reading more about the nervous system. The art museum failed to do this. A tour through the gallery presents information, only some of which I could relate to and understand because of the format it was presented.

The second message I took away was the importance of an open dialogue in communicating ideas. Even in a talk, Stephanie gave examples of how one can ask the audience to call out, to present a show of hands, to take a moment to think about something. This interaction was present in those science museum exhibits, even if it was not a person leading with questions. The words on the walls next to the exhibits ask questions, and made me think about what I was seeing. When I think back to engaging talks, this is something a lot of them have in common. I think this is a challenging one to work on, because audiences are different all the time, and what worked one minute ago for one person may not work as well for the next. I envision a moment of anxiety after asking a question where the thought occurs to me “what if no one answers?” While connecting to each audience I engage with seems like a daunting challenge, this also presents a unique opportunity to think on my feet, and forces me to really think about who my audience is, and how I can tailor parts of my talk to connect with them.

Student Post: What Can You Say to

“Hook” the Apathetic Teenager?

Juliana Houghton is a M.S. student at the University of Washington School of Aquatic & Fishery Sciences. She studies how boats affect the acoustic environment of killer whales.

What can you say to “hook” the apathetic teenager?

In seminar today, we did the “usual” for our class: played an improv game, did an activity to make us think about how we communicate our research, and discussed science communication with guest lecturers. This week’s game, as is necessary for good improv, made us rely on quick thinking and adding positively to the story (and not negating what someone else has said). One person sat in the “throne” at the front of the room while the rest of us lined up for a chance to win our way into the seat of honor. It was our job to come up with a situation that would make them give up the chair. Some of the scenarios were pretty entertaining, from free lunch down the street to an emergency weather warning. But usually, the person occupying the chair was able to come up with an excuse as to why they didn’t need to get up. Like when I pretended to be a pregnant lady in labor, needing the chair to push out a baby, I got a, “Well I don’t like babies” in response… I was caught off guard and ended up laughing and giving up. I guess that’s the point right – expect the unexpected, don’t be surprised by what people may say or ask you. It was great practice for talking to the public and being prepared for questions you might get.

My favorite part of class was a mock cocktail party, complete with sparkling cider at 9:30am. Half of us got to be a character, like a preacher, police officer, or private boater, while the rest of us got to be ourselves, trying to talk about our research and science in an engaging way. During the first round, I

found out just how difficult it is to come up with how to engage a person that might not seem to care at all about science, the environment, or anything else related to my research. I had prepared to talk to the private boater/fishermen. It made sense that I should get ready to talk to this character since my research (on how boats might affect killer whale habitat) might directly affect them. But I was (again) caught off-guard while talking to the social worker and the apathetic teenager. This is something I'm going to have to work on…

In the second round of the "mocktail" party, I got to play the apathetic teenager. And wow, did I have fun with that. I got out my phone and pretended to be too busy texting to care what anyone said. I rolled my eyes and said "like" a lot. Some of the scientists I talked to really struggled to find something to pique my interest. I did give a bit away that some of my classmates were able to latch onto: I admitted that I was texting a crush of mine. Then some of the scientists were able to make me a bit less apathetic by turning the conversation on me and on what I found interesting. Some even succeeded by making pop culture references (like referencing the TV show Deadliest Catch). The whole experience was really entertaining, but also really informative.

Student Post: A Cocktail Party With 'The Others'

Kirsten Feifel is a PhD student in the School of Oceanography. Her work is on developing a new way to create historical records of harmful algal blooms using sediment cores.

It really is an interesting challenge to try and communicate your research to “the others”. And who might the others be? Well, they are everyone BUT scientists; so really the vast majority of the world. Ergo, my research, despite my best efforts over the past five years (FIVE YEARS!) to make sure that the dataset is as perfect as possible, means little to anyone outside a tiny, minute minority of sympathetic scientists. Shoot.

Well, all true unless I learn to change my approach. And, that is what today’s activity was all about. We did a role playing game where people took on different personas: the farmer, apathetic teenager, soldier, the shockingly conversant “two-year old”, you get the idea. Our task was to mingle with these different characters and figure out different strategies to convey our research to people outside of science. This, for a social person like me, turned out to be much more difficult than I would have expected. The teenager was consistently on her phone and would not make eye contact while the farmer wanted to know how the ocean affects his crops. Errr… let me show you the statistical variance with that?

So, point made. How I present my science at cocktail parties may not be so invigorating to folks outside of my comfort bubble of research. Maybe that is why people seem to wander off from me at the bars? Talking shop, and in this case, the scientific shop, to anyone is a talent. Finding that commonality that both of you are interested and vested in takes work and creative thinking. Error bars mean nothing to Joe Schmoo on the corner, he wants to know how it will affect his perceived world. We have to learn to manipulate our story, our research, to better mesh with the worlds of the others. They won’t learn to speak our language so we have to try to speak theirs.

Student Post: Communicating

Science to a Diverse Audience

Sonia Singhal is a second-year Ph.D. student in the Biology department. Her research uses viruses and bacteria as models for studying evolution. When she is not working in the lab, she can usually be found writing fiction or reading children's books.

The highlight of this week was a big game of "pretend." We imagined a cocktail party, in which scientists interacted one-on-one with members of the public, to help us communicate our research to many different kinds of people. For homework, we had put together a list of people who might attend our Town Hall talks. We tried to imagine what their lives would be like. What concerns would these people have? What would be important to them? How would they want to be respected? Our cocktail party took this exercise to the next level. Some of us acted the role of specific audience members (police, fisherman, social worker, priest/other religious leader, middle school student, uninterested high school student), while the rest of us played scientists who had to explain our work in a way that was accessible to these people.

Practicing my elevator pitches to people with different interests was a fun challenge; but I ended up enjoying being an audience member even more. Because we had an overabundance of jobs for our second round, I ended up with two tags—middle school student and fisherman. So I acted eager and endlessly curious and asked the scientists lots of questions about how their work related to fish. I probably drove at least one scientist crazy by continually turning the conversation back to fish.

Here are some things that I learned from our exercise:

- People usually wanted to know **why my research is relevant to their lives**. The hardest question I got came from a student playing a social worker, who wanted to know how my work in evolution would help homeless people.

- It was important for me to figure out **at what level to aim my discussion of my research**. When I was faced with both a policeman and a middle school student, I wanted to make my research interesting to both of them without alienating either one. I settled for using the smallest, simplest words possible (for the sake of the middle school student) and letting the policeman ask more detailed questions, or substitute in other vocabulary.
- **Small talk ended up being a vital bridge-builder**, a way to establish a basic connection with the other person even before discussing my research. When I was playing the scientist, I tried to start with, “What do you do?”, or “How do you like the party?” I tried to let the other person initiate the conversation on my research. When I was playing an audience member, I realized how important this had probably been. Scientists who dove straight into their research, without saying hello or how are you, seemed to me (as a middle school fisherman) to be a little more distant, as if they only wanted to talk about themselves.
- One of the most challenging parts of our activity for other class members was interacting with unresponsive audience members—for example, an uninterested teenager who texted while the scientist was speaking. One suggestion for such a situation was to **use the teenager’s distraction as a way of connecting**. For example, “Who are you talking to?” Or, “Do you know that there’s an app that will let you listen to whales?”

In my opinion, the skills we practiced at our cocktail party are well worth learning, even for scientists who only plan to interact with other scientists. Science has become such a specialized discipline that microbiologists cannot always understand other microbiologists, much less physicists. If you can explain your research clearly to someone like a middle school student, you are almost certain to be able to explain it to other scientists—whether they are inside or outside your specific discipline.

Student Post: Science

Communication, a Recipe for Success

Megan Gambs is a graduate student in the School of Oceanography, at the University of Washington. She uses computers to investigate Earth's climate in the past.

We, as scientists, often view scientific presentations as just an assembly of Power Point slides. Dr. Melissa Clarkson demonstrates that a stack of slides is not an effective means to communicate science to one's peers, let alone the public. She stresses a point made by Jeff Tzucker that presentations are about the speaker, not the words and images projected on a screen—"You are the presentation."

Preparing for and creating a presentation is a process, Clarkson explains, which requires time and thought. In fact, she provides a road map for this as a two-step process. Answer two questions: What? and How?

The first step seeks to develop content: What are you going to present? Who is your audience? What is the context? What are your goals in presenting this information? What do you want your audience to take from the talk? To accomplish this first step collect your ideas. Decide what is essential to meet your goal. Then, storyboard. Break out sheets of paper, or Post-Its, and write down major ideas—"chunks of information." Use these to develop a linear and logical narrative of your information. Then, at this early stage, get feedback. Present your storyboard to a potential audience member. Heed the suggestions given. Feedback at this early stage allows us to change or restructure our content in response to the reviews, before spending hours formatting in Power Point or Keynote.

In today's class, we did this exercise. We partitioned our main ideas and big picture statements onto individual sheets of paper, then, organized them into a linear storyline. Next, we presented our storyboards to fellow graduate students. The feedback was phenomenal. Though we are all

graduate students, our backgrounds differ, which permitted the feedback to be tremendously insightful. This activity highlighted the need to understand who the audience is and what piques or diminishes their interest. The process was enlightening, and the feedback was invaluable.

After completing step one, Clarkson suggests developing the ‘How’. How are you going to present the ‘what’? Develop a method to present your content and establish a hierarchy of your ideas. What is most important? What information is auxiliary and can be omitted? Only now, should you begin to construct a set of slides to compliment and support your words. Then, once more, gather feedback.

Yes! Listen to feedback, twice. Through gathering feedback twice during the process, Clarkson claims you will receive more honest feedback on both the content of the material and how you effectively present that content.

I truly look forward to using this method of presenting material, not only for future presentations, but also for posters, papers, and figures. Too often, our presentations become these droning sagas of information, strung together by minutes of unnecessary—or even tangential—research. We cloud our main points, in jargon, caveats, and subtleties. Especially, when communicating to the public, we must work to present science in a clear manner, designed to successfully communicate main ideas. In setting aside time to thoughtfully work through the purpose and content of a presentation, there is hope for scientists to communicate, effectively.

Student Post: Recipe for a Good Talk

Makrand Sinha is a PhD student at the University of Washington pursuing research in Theoretical Computer Science. He spends most of his time sitting in cafés, sipping espressos, scribbling math onto pieces of paper

and trying to mathematically prove that there are things which computers will never be able to efficiently compute on massive datasets.

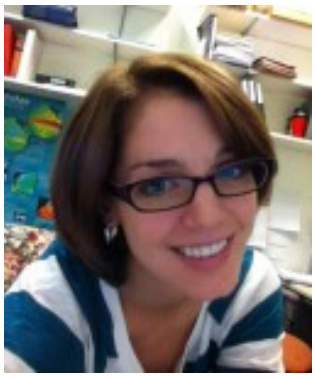
Just last week I had to attend a seminar talk which I was very excited about. But as soon as the speaker started – his first slide being a wall of text – I knew my time would have been better spent elsewhere. And surely the next day when I tried to recall what the speaker was talking about, I could not recall anything apart from what I already knew about the topic. This is the story of many of the talks that I have attended before. For a while I felt that maybe I was not smart enough to follow these talks, but as time has passed I have come to realize that these talks were in fact terrible. And it will be a sad state of affairs if we as scientists keep on giving such terrible talks. After all if we can't even explain our research to our peers who are excited about the subject and make an effort to understand our horrible explanations, how can we make kids interested in science and how can we convince the government to fund our research?

So what is the secret recipe for a good talk? This was precisely what the guest speaker for today's Engage lecture, Melissa Clarkson tried to tell us. According to Melissa, while designing a presentation we should keep in mind the two main principles of design – the 'what' and the 'how'. 'What' as in what will be the content of the talk? To figure this out we need to understand our audience, anticipate what they know, and also understand the context of our talk – whether its an informal lunch talk, a seminar, or something else. Another good question to keep in mind while deciding the content of your presentation is what is your goal as the speaker? What would you want an audience member to say when he walks out in the hallway and someone else asks him what was the talk about?

And only when you have thought about the content of your presentation and gotten enough feedback on it, you should think about the 'how' of the presentation – how should you present the information in a clear and coherent fashion? How do you explain concepts which might be difficult for your audience to understand?

After Melissa's lecture, I thought about my first research talk that I gave a few months ago. It was exactly like one of these terrible talks I was talking about. While the ideas which I was trying to present seemed completely natural to me since I had been thinking about them for months, the audience which consisted of experts in my own broader field had a hard time just thinking about the basic definitions. Maybe if I had asked these questions while preparing the talk, it would have been a better talk.

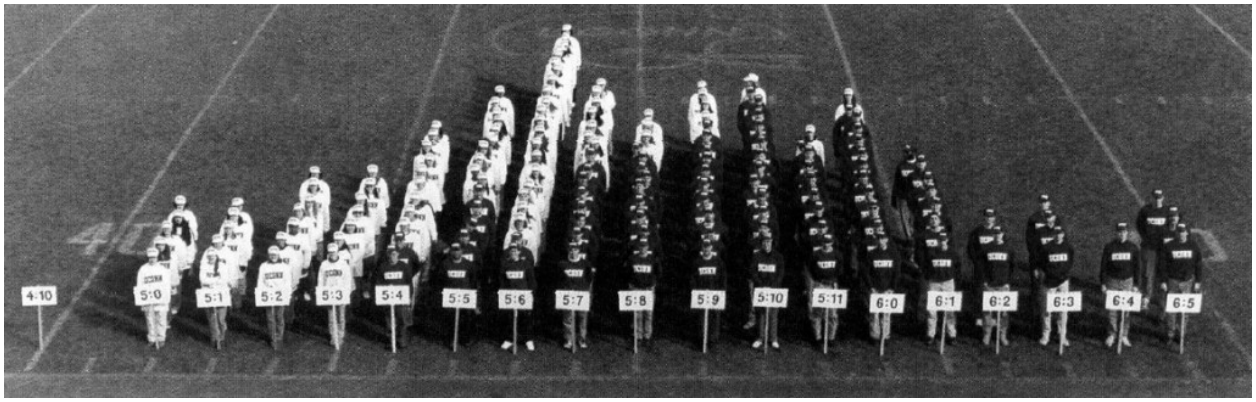
Student Post: Simple, Beautiful, Relevant: Communicating Science through Visualization



Patti Carroll Astronomy PhD student working on two new radio telescopes in a race to discover the Cosmic Dawn. She believes strongly in the need for effective communication of science to the public and especially to politicians.

A picture is worth a thousand words. This is certainly no less true in science research. We can crunch numbers all day long, but most results don't come to life until we visualize the data in some way. By plotting one variable against another, a trend suddenly emerges and you're on to something. For us, the data speaks for itself. Basic procedure: plot x versus y, label your axes and units, include errorbars, a legend or colorbar, and a caption. Still, in order to understand a figure, it takes us at

least a minute of studying and reading the accompanying text. If we want to communicate the same result to non-scientists however, we must take a vastly different approach.



A living histogram of student heights at Connecticut State Agricultural College, by Linda Strausbaugh (Genetics 147:5, 1997)

Our guest speaker this week was a good friend of mine, Jim Davenport. Jim runs a popular blog that focuses on effectively communicating data through visualization. He was generous enough to share some basic tips and insight with us.

"I have always been keen on making good figures for my research, but didn't fully appreciate the artistic aspects until I started working on this blog [ifweassume.com]. I quickly found that people resonated most with the "beautiful" visualizations; they would get shared and passed around … There's a slippery slope here, however! I'm not a graphic designer or artist, and it's easy to get sucked in to making visually pleasing but useless figures … It's not about art, it's about effective communication."

-JRAD

Make it simple. Decide on the single point you want to enforce with your figure, and limit it to communicating that point. Do not oversaturate a single figure with too much information. Get rid of unnecessary text. If you aren't going to talk about it- then leave it out. You don't want it to be

overwhelming. If there's too much going on, too much to comprehend, then your audience will tune out. Less is (usually) more.

Make it beautiful. Craftsmanship is key. Once you've decided on the best type of figure to clearly communicate your point, you must spend time on the design aspects, i.e. color, hue, saturation, brightness, contrast, font type and size. Let's state the obvious; people must be able to see your figure clearly if you hope they will gain any information from it. Consider colorblindness when making these choices. About 1 in 12 men have some form of colorblindness; don't alienate them. All of this may feel daunting at first (as Jim said, we're not all graphic designers or artists), but you'll get the hang of it with a little practice. There are many online tools to help in making these decisions. Black and white is a perfectly acceptable fallback.

Make it relevant. Context is key. Your figure should fit snugly into the flow of your presentation, or else your audience will be confused upfront. Not only should the figure be obviously relevant to what you're talking about, but you can make it more relevant to your specific audience by considering who you're talking to when making design choices- what will they find visually appealing? Make it human. This is where you can get a bit artistic and creative. You can reach your audience at a deeper level in this way, driving your point home.

With these basic rules in mind, any scientist can begin to communicate their results better through the use of effective visuals. With that, I leave you Jim's top 3 pieces of advice for scientists presenting data to lay audiences:

1) Use fewer words at first. Visuals matter. People are mostly visual learners online, and usually in person as well. If you hide the meaning in a giant block of text/words, people will get lost. If you use blue text on black background, nobody will be able to read your work.

2) Talking about your research should be like telling a beautiful story. There should be a goal, obstacles to accomplishing it, your brilliance and tenacity ought to be the hero. Parenthetical asides will ruin your flow. Each section must transition in to the next. An outline and conclusion are not suitable means to guide the audience.

3) People aren't generally stupid; you just need to frame your work into language they understand. Lots of tricks get used here, especially analogies (e.g. describing the expansion of the universe like baking a loaf of raisin bread). It also is a reminder that nobody cares about the minute details that keep you up at night. *Every job* has both the big picture and the day-to-day slog. You spend every day slaving over coding errors, but if you're not talking to other specialists, you probably want to talk about big picture things, 10-year timeline things.

Student Post: Scientists are Humans Too

Fernando Gonzalez is Colombian/Peruvian scientist living in Seattle, Washington. He also blogs at Science Salsa, a blog about science that is tasty and wonderful and makes your life better.

My presentation wasn't going well; the audience was full of sleepy eyes and empty stares. Apparently, I wasn't giving them a good story, and I wrongly assumed they will be able to cope with that. Too many years listening to scientific presentations can fool you to think that way.

Don't get me wrong, there are plenty of amazing scientific presentations; the problem is those are a minority in a field full of boring presentations that require a titanic effort to follow them. The hard-working audience happily digesting big amounts of jargon is a myth we scientist love to believe. But this time I was inflicting a scientific presentation onto my scientific audience and they were failing miserably on their effort to stay awake. I wish I can blame them, but the fault was only mine: After attending too many poor presentations I believed people in science –myself included– don't need a story to keep them engaged, only graphs with lots of new data showing you can produce results for publishing. Give your best result near the end of your presentation and reasonable final conclusions and everybody happy, right?

I have not been such a scientist all my life. I did have success engaging scientific audiences in the past, but now my presentations really needed help. Ironically the place I regained this lost knowledge is a seminar that helps graduate students to speak about their research to general

audiences. It turns out that scientist are humans too. The lessons learned about what makes a good presentation for general audiences are valid for scientific audiences. I was very lucky to attend the Engage seminar series at University of Washington. The instructors, guest speakers, and students really performed a splendid job, and it was an honor to join them this quarter. Let me tell you some of the things I learned with them.

1) Know your audience: This is often overlooked, but no presentation fits all needs, different audiences need different presentations. Are you presenting in a journal club? Perhaps a department seminar? Open lecture? Science café? Town Hall? Middle school? Only after having a clear idea about your audience you can build your presentation. A common tip is to imagine some people you know that fit the intended audience and make the presentation for them.

2) Respect your audience. Do not underestimate your audience's intelligence, but do not assume previous knowledge of your jargon. Enough said.

3) What do you want to say? Yes, you need to have content, and you need to decide what the take-home message is.

4) How do you want to say it? This is more about accessibility for the audience and personal style. I used to believe that content is king and style is frivolous, but that is not based on evidence. Good content is lost if is not delivered in a way that reaches the audience. Style matters, a lot.

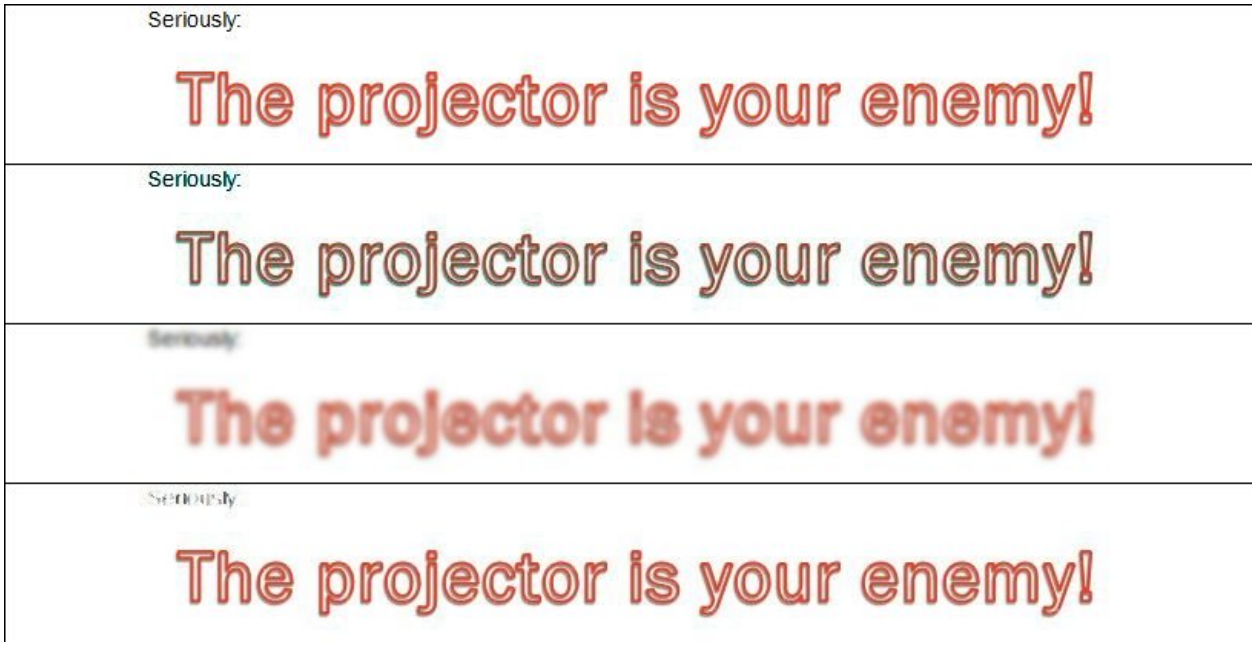
The first thing I learn at the Engage seminar was the power of storytelling and a personal narrative. As a scientist I tought a strong narrative was a great graph (like the famous Keeling curve) but for most people, that graph is just a meaningless sketch. It takes good storytelling and great visuals to bring that narrative to the general public. The best example is the movie "An Inconvenient Truth": it made the Keeling curve an essential part of the story, but people watched the movie because of the storytelling, not because of the curve itself–If you want to engage your audience you need a story!

This is also valid for scientific audiences. Most of the amazing scientific presentations I attended were either a detective story; a heroic battle full of obstacles to obtain the holy grail of data; or a tale of effort to understand phenomena that conflicted with previous accepted knowledge. Pure storytelling!

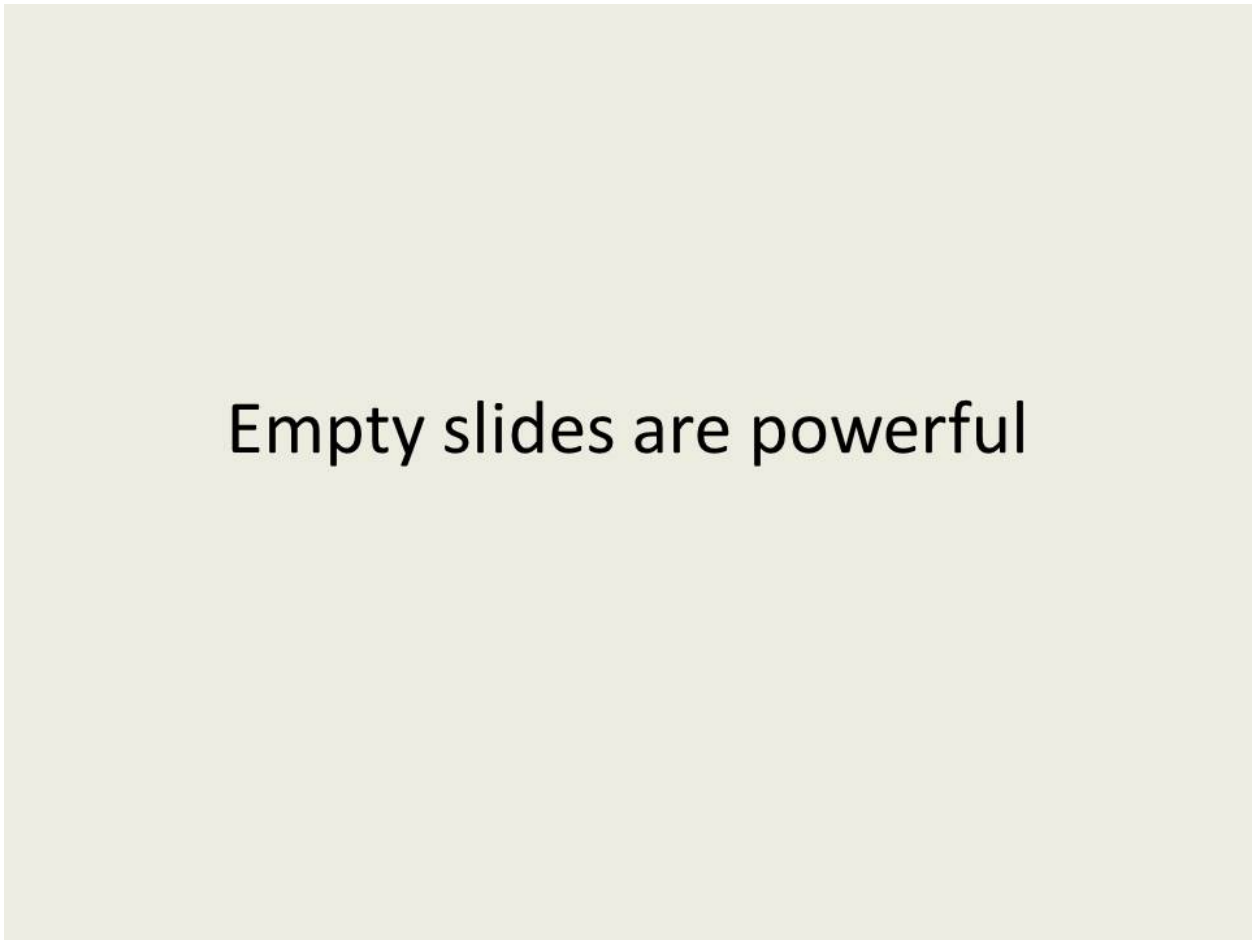
5) Make a storyboard, play with it, and ask for people's input before starting to make your presentation's slides.

6) Make your slides, then clean them, distill them, remove the fat, simplify. Simplify again. What is really important? What can go away in this slide? Use analogies, animations, pictures and maps to help the story flow, leave them behind if they are just pretty and don't help the story. Test your slides and make sure the colors and lines are visible not only in your screen but also when you project them. Slide design needs to take into account that people will be watching the projected image and

not your screen. Some venues have all chairs at the same level so you cannot use the lower part of your slide; some projectors kill color and delete lines. Seriously; the projector is your enemy.



7) Another good point was to learn that empty slides are powerful. Let me repeat this because it is important:



The slides are a prop, an aid, a medium, but you (the presenter) are the presentation. What a powerful moment when you have an empty slide in the middle of a presentation; only your voice fills the room, all eyes looking at you, all ears listening, and no distractions. But your voice and slides don't tell the story alone. All your body is there. Your voice, your arms, your heart pumping fast, all of those are your presentation. We learned a lot about our body language and how it can help or it can damage a presentation, how it can make it accessible to your audience or it can build walls between you and them. There is also a lot to say about how your own love and enthusiasm shows in your presentation.

I think these enthusiastic grad students that took the class and are ready to present their work at Town Hall Seattle are doing something wonderful. They are going outside their comfort zone to show their complex work in simple, jargon-free presentations, but additionally they are showing to the public fascinating, resourceful and tenacious humans that are also scientists. Their science stories, with just the right amounts of craft and soul, are to be re-told with delight at home by members of the audience.

In the age of PowerPoint, it is hard to remember that you are the presentation, not your slides. Please, if you need to bring only one thing to your presentation, bring yourself. Remember it.

Paper shapes and gluesticks

Posted on July 30, 2013 by  Melissa Clarkson Posted in Communication ideas and experiences —No Comments ↓

Welcome to the first Engage blog post for this summer. I'm Melissa Clarkson, a PhD student in Biomedical and Health Informatics, and I will be sharing with you some of my experiences and ideas related to communication in science. I earned a Masters degree in design from Carnegie Mellon University before coming to the UW, so many of my topics will be in the area of visual communication design. In this first post, I will be sharing a simple activity that you and your friends or colleagues can do to help develop your skills in visual communication.

There has been a growing awareness of visual design over the past half-dozen years. I suspect this is due to both the endless amount of design we experience on the web and the designs of products developed by the consumer electronics industry. The appearance of an object or information is important. It affects whether we perceive it as being trustworthy, valuable, friendly, interesting, and "cool".

But there is another purpose to visual design: to communicate clearly. How can a design help you to find information quickly, identify the most important pieces of information, or see the structure of the information? This type of design is very relevant to scientists. We are expected to communicate through the figures we create for papers and the slides we make for presentations. But how many scientists have any training in visual design?

One of my projects has been to attempt to distill the fundamentals of visual communication design into a curriculum appropriate for scientists. But many of these skills are relevant to everyone. A couple weeks ago I was asked to meet with teachers from Lakeside school (located here in Seattle, grades 5–12) who were interested in ways to incorporate visual communication into students' projects. We talked about the types of information they wanted the students to communicate, then I gave a crash course on the fundamentals of visual communication design. One activity I had the teachers do was to communicate the concepts of hierarchy, grouping, and sequence using only paper shapes glued to paper.

Supplies

- Squares of white paper (8.5 × 8.5-inches works well)
- Gluesticks
- Squares of paper: black (small, medium, large) and gray (small, medium, large)
- Circles of paper: black (small, medium, large) and gray (small, medium, large)

Provide at least 6 shapes of each type per person.

The theory behind the activity

You control **position**, **color**, **size**, **shape**, and **orientation** of individual graphic elements, to achieve **contrast**, **repetition**, **alignment**, and **proximity** in the composition,

to communicate **hierarchy**, **grouping**, and **sequence** to the viewer.

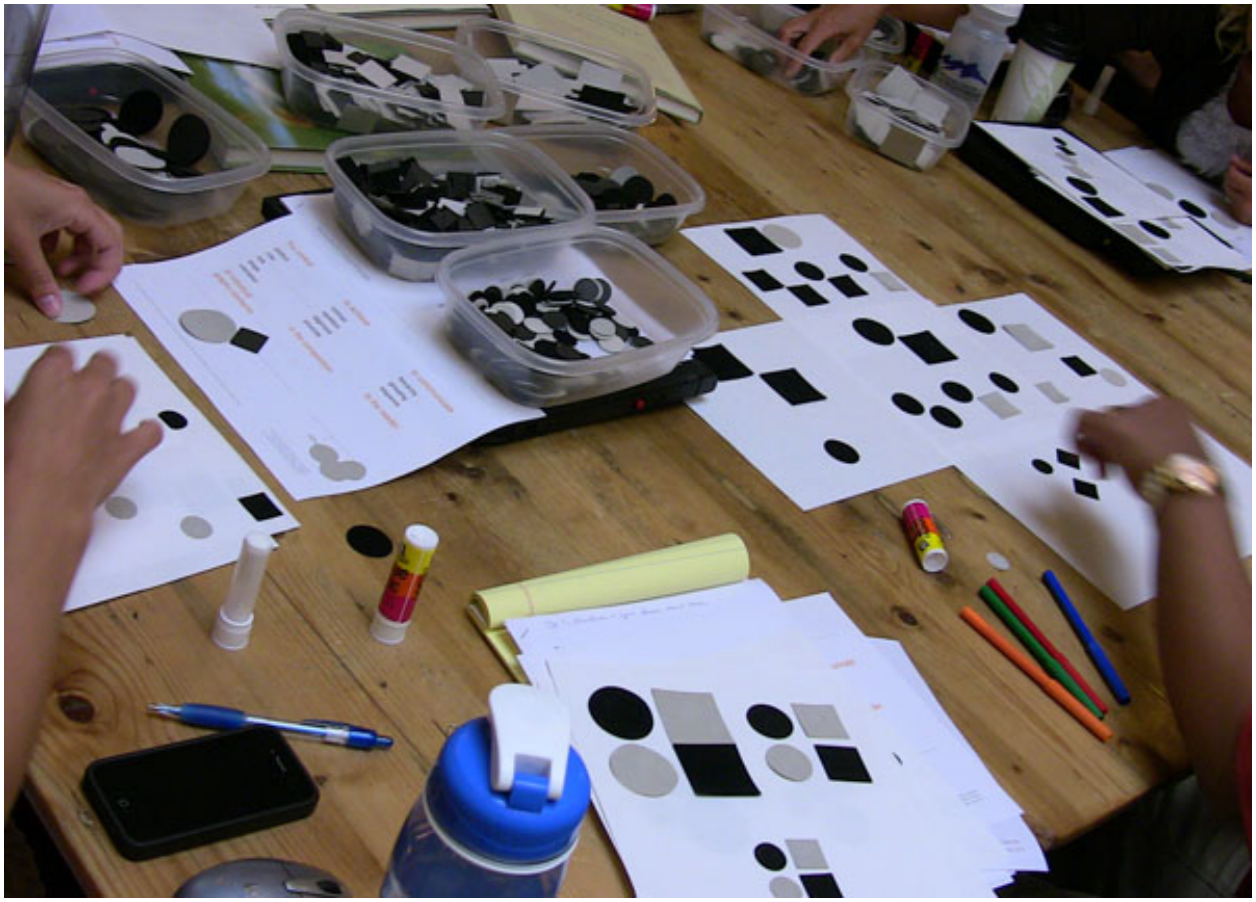
These terms have very general definitions:

- Hierarchy: a dominant-subordinate relationship among elements
- Grouping: a relationship that specifies the elements to be associated together
- Sequence: a relationship among elements that specifies first, second, third…

The purpose of this activity is simply to communicate these three concepts. You will not be communicating any content or information (so it should be easy!).

Instructions

- Create a total of six compositions (two that communicate hierarchy, two that communicate grouping, and two that communicate sequence). For each pair of compositions that communication the same concept, find two different ways to communicate that concept.
- Use between three and ten shapes per composition.
- The shapes should not touch or overlap.
- Because you are not communicating any content (only the concepts of hierarchy, grouping, and sequence), the shapes do not represent anything. Squares are simply squares and circles are simply circles. (So you should not use the shapes to represent things like genealogical trees, organizational charts, or bullet lists.)
- Take about 20 minutes to create your compositions. Then show each composition to others in the group. Have them tell you what your composition is communicating (hierarchy, grouping, or sequence) and why.



What you will find

This activity is much more difficult than you might imagine. Some of your compositions will quickly communicate the concept you intended to everyone in the group. For others, the composition you thought was so obvious will be unclear to others, and they may even strongly disagree on what you are communicating. Listen to the reasons for their answers. Was it the way you used color? Was it the proximity? Alignment?

You will also learn that communicating one of these concepts without implying at least one other can be quite difficult.

Why this is important

These three concepts—hierarchy, grouping, and sequence—are important in every effort to visually communicate information. So be aware of them and practice communicating them.

In addition, this activity demonstrates that you can believe your design does a good job of communicating, but other people may not interpret the design as you intended. So seek out feedback and revise your designs until they work for your audience.

Get feedback. On everything. Even butts.

Posted on August 18, 2013 by Melissa Clarkson Posted in Communication ideas and experiences — No Comments ↓

I am a huge believer in the importance of getting feedback about talks, posters, and figures while they are still in development. If you wait to get feedback until you believe you are finished with a project, you aren't likely to get honest responses. Most people will not want to tell you, "Wow. You really did a lot of work. But…"

And worse yet, if you don't seek out feedback at all, you have no idea if the thing you created to communicate information makes sense to anyone else. All you know is that it makes sense to you. But that doesn't count.

Seek out feedback early, often, and from several different people. And try to find people who represent the audience your design is for. Because if you only get feedback from people already familiar with your work, that isn't a real test of your design.

Get feedback even when it seems like a hassle. Or is a bit awkward.

As part of my dissertation work I am creating a set of stylized graphics representing human anatomy. A while back I was working on graphics for the organ systems (circulatory system, nervous system, respiratory system, urinary system…). One day a friend asked me what I had been doing, and I

showed her my graphics. She pointed to one and said, “That looks like a guy with a uterus.” Oh. It was so true. I just didn&#8217t realize it before. But now that I knew that, I was able to adjust the hips and turn it into a female with a uterus.

That made me realize that I needed to start showing these graphics to people. They are supposed to be very simple graphics for use as navigational icons in a software tool. People should recognize them as the intended parts of human anatomy, but not think much about them. If the graphics looked a bit “off”, then people would get distracted by them.

My next task was making the male silhouette from a side view. I wondered if the butt I had drawn looked OK. Unless you have ever tried to trace images of human bodies, you have no idea how much variation there is. I needed a generic butt, and so I needed some feedback. I went searching for people and found a professor in my department. His reaction (after looking at me strangely) was, “It’s too big and too high.” OK. Now I was getting some place. But how much too big and how much too high? I decided that I needed to collect some data, and that the easiest way to determine what a generic-looking male butt looks like would be to make a matrix of butts. Along one axis they would vary by shape and size, and the other axis they would vary by height.

And now I needed some people to look at these butts. This happened to be the day that the MD/PhD program was interviewing students in the conference room directly across from my desk. I very seriously considered going to the group of waiting students and trying to explain what I was doing, but I figured that might get me in trouble with the people running the MD/PhD program. So I hung around the office and cafeteria looking for people I knew. After asking about seven or eight people to

point at the most normal-looking male butt, the data was definitely favoring the fourth silhouette from the left. There wasn't a significant preference for either height.

(And in case you are worried about the lack of front anatomy—as one person that day was&#8212my afternoon project was to work on the male urinary and genital systems.)

So that is my story. And I hope it inspires you to seek out feedback on your own designs.

Plan your presentation on paper (not in PowerPoint)

Posted on September 26, 2013 by  Melissa Clarkson Posted in Communication ideas and experiences — No Comments ↓

Earlier this summer, a colleague (who I will call Dr. Expert) was starting to put together a slide presentation for an academic conference. He approached this task in a fashion that is probably quite typical. He took slides from every previous presentation he had given that was relevant, compiled them into a single file, rearranged them, and then tried to figure out where a few new ones needed to be added. Dr. Expert showed this PowerPoint file to me about two weeks before the conference. He flipped through a few slides, explained a few diagrams, and told me he thought it was coming along well.

I tried to keep my mouth shut. I really did. But it was quite clear to me that there was not a logical flow of information behind these slides. And if I, as a person fairly familiar with this project, could not follow this explanation of the project, there would be no hope for anyone in his audience.

An intervention was desperately needed. This was a very important conference, which would be attended by our competitors fellow research groups with different opinions and approaches. We needed to make a strong showing. But knowing how busy Dr. Expert was, it was unrealistic to expect him to start over and follow my Official Presentation Design Process and then make an entirely new set of slides. So I offered to help with his slides if he would work with me on the structure of the presentation. He agreed. I told Dr. Expert that tomorrow after lunch we would go to the library with crayons and pencils and paper and work on this.

I showed up the next afternoon to his office with the supplies and said I was ready to head to the library. He looked up at me with a rather strange expression and said “I thought you were joking.”

I don’t joke about presentation design. I think this is a very serious matter. If a presenter is going to take up people’s time, they have the responsibility to develop a thoughtful, meaningful presentation. And in my opinion the process DOES NOT BEGIN WITH POWERPOINT. It may end with PowerPoint. It does not begin there.

Dr. Expert reluctantly followed me to the library, where I had reserved a study room. I started with the three questions that are essential to planning any presentation:

- **Who is the audience?**
- **What is the context?** (For example… How much time will you have? What type of room will you be in? How much will you be interacting with the audience?)
- **What are the goals of the presentation?** (What do you want them to understand or think about? What impression do you want to make?)

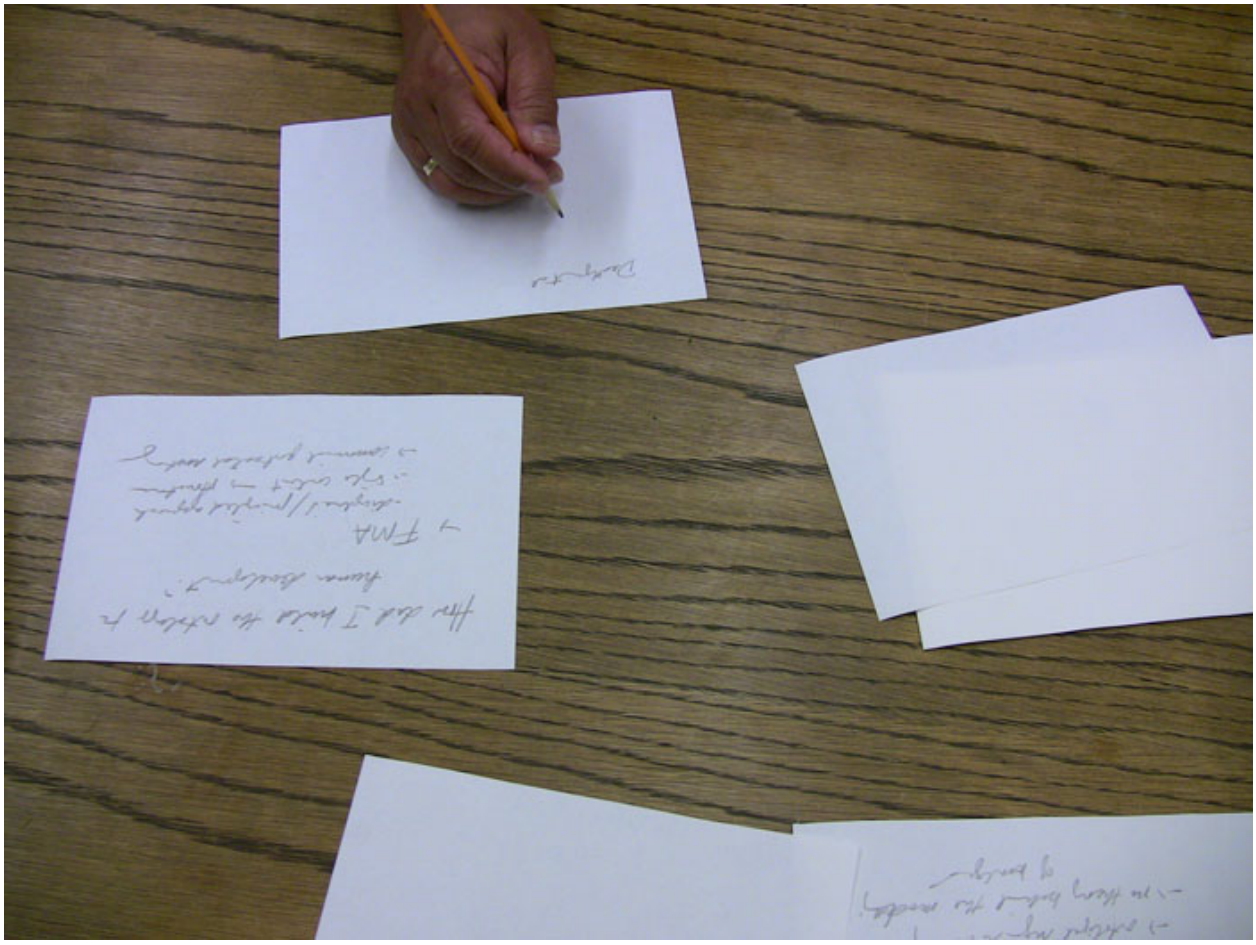
Once I had satisfactory answers to those questions, we progressed to the really big question: **What is the essential message than an audience member should take away from the presentation?** *Imagine that someone has listened to your presentation, and then later that day sees one of their colleagues that did not make it to the presentation. That person says “What was the talk about?” What do you want that member of your audience to say? This is a very important question to answer, because it helps you to focus your presentation.* Once Dr. Expert and I worked through refining his “big message” statement, we moved to the storyboarding stage.

I laid down the stack of half-sheets of paper and explained that these pieces of paper did not represent slides. They were for information chunks. He was to use these pieces of paper to write down small chunks of information, and then we would work on arranging them into a logical narrative. By working on these pieces of paper it would help us to see where we have unnecessary information or gaps in information.

Dr. Expert gave me a look somewhere between “I am at a loss for how to begin” and “I think this is ridiculous.” But after a few moments of staring at him and some polite prompting, he reached for a pencil and some paper and started writing down information that would be appropriate for the introduction of the presentation.

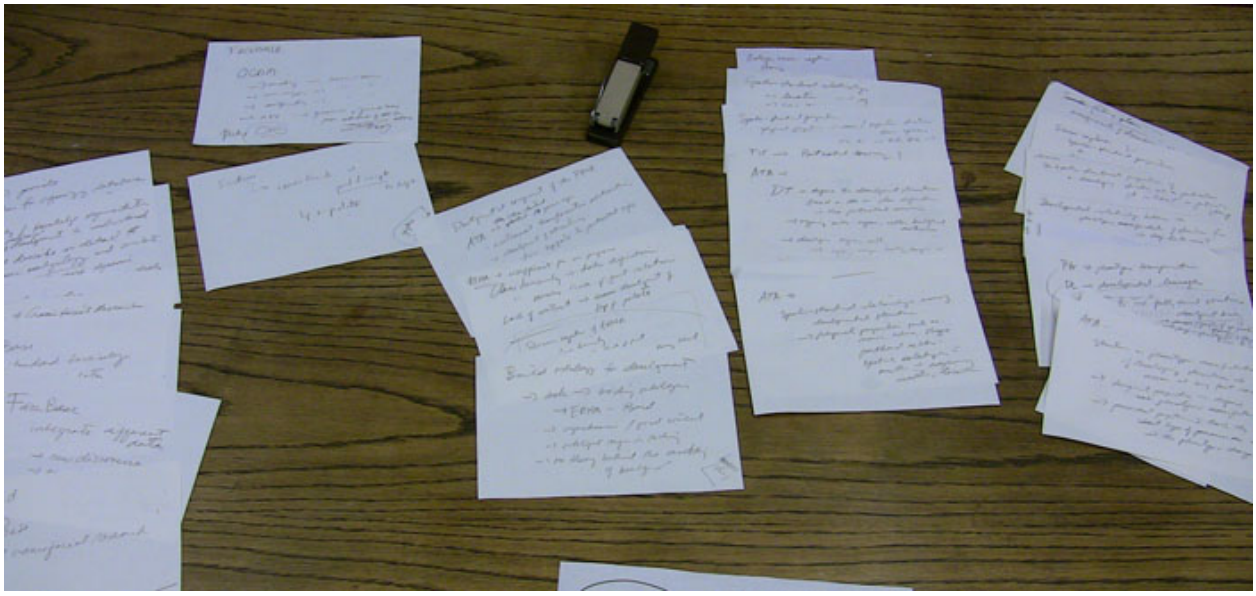
The first few pages came slowly. But seeing those pages lined up must have convinced Dr. Expert that there was some value to this exercise. Soon he was off in his zone of expertness furiously scribbling out information chunks, reviewing the papers, rearranging the papers, and verbalizing the

flow of information on the papers. I spent most of this time sitting quietly, occasionally pointing out gaps in information and helping to clarify the overall structure of the presentation.



About a half hour into this exercise I started to get a bit worried, for two reasons. First, my supply of half-sheets of paper was rapidly being depleted. (Fortunately I had also brought some scratch paper, so we started using that when needed.) Second, his handwriting was getting ever more sloppy as time went on—and I had agreed to take the first pass at putting this information together into a set of slides.

Nearly an hour after we started, Dr. Expert finished creating the information chunks for his presentation. We spent some more time reviewing the arguments and organization. And of course I kept pointing at pieces of paper and asking “What does this say?”



Then we went back to our offices. I transformed these information chunks into a series of slides and made a lot of diagrams, he reviewed and finished up the slides, and then he left for the conference a few days later.

Dr. Expert said the presentation went well, but I didn't believe him until Dr. Very Important mentioned to me that someone who attended the conference told him that Dr. Expert's presentation was very good. So I think it must have been a success.

After all this was over, I told Dr. Expert that I would be writing a blog post about this approach to presentation design, and I would like this thoughts. Here is what he had to say:

- "I thought, 'Why do I have to do this? It's already in my mind!' But seeing the ideas on paper actually made more sense than what was in my mind."
- It helped him to focus on what he was trying to explain.

The approach I have described breaks presentation design into two steps: **1) What am I going to present?** (Figuring out the message, the information needed to support the message, and the narrative), and **2) How am I going to present this?** (Making slides and visuals, practicing how to verbally move through the presentation). I think that when people use PowerPoint as a tool for planning presentations, they allow themselves to move into step #2 before they have done the difficult work of step #1. If you begin on paper, you force yourself to examine your information and your argument. And your audience will thank you for it.

Having conversations on emotionally-charged topics…and getting hit with big balls of nasty

Posted on October 29, 2013 by  Melissa Clarkson Posted in Communication ideas and experiences — No Comments ↓

The directors of Engage have a commitment to helping graduate students in science learn to communicate their research to members of the public. So far we have focused our training on developing lecture-style presentations accompanied by slides. But we realize there are many more opportunities to communicate with the public about science, such as hands-on demos and facilitated discussions. And one more idea that came up at a meeting last summer was to provide strategies for conversations on topics that could lead to an emotionally-charged situation. (Basically, strategies for talking with someone such as a relative who disagrees with aspects or implications of research and wants to argue.) I believe this situation happens commonly to people in environmental science, but I suspect it could happen to anyone whose research relates to something people could form an opinion about.

When this idea of providing strategies for these types of conversations was first brought up, I had nothing to offer. My research is on a very obscure and non-controversial topic. (I am developing

designs for online tools that will allow scientists to browse large and complex repositories of curated scientific knowledge. If anyone starts arguing with me about this, I will be very surprised.) But I had an experience last week that I think I can use to begin our search for strategies. This experience is a little more about policy than science, but it is the only example I have, so I am going to use it.

In addition to my dissertation work, I have a project that I did not ask for, and do not want to do. But it is one of the most important things in my life. My family is advocating for mandatory disclosure of harmful medical errors to patients (and families, as appropriate) in the state of Kansas. We are doing this in response to a medical error that happened to my father. After my father's death, my family felt quite strongly that we needed to talk to the hospital where this happened to ensure they were aware of this and had taken steps to make sure it did not happen again to another patient. We were able to meet with the hospital CEO, but encountered something known as "the wall of silence." I have a website and blog, disclosemedicalerrors.wordpress.com, that explains the situation and documents my family's efforts to get a law passed in Kansas that would require disclosure of unanticipated medical outcomes and harmful medical errors to patients. (By my latest count, I believe that eight states have mandatory disclosure laws, and two have discretionary disclosure laws.)

Just how complicated and emotionally charged is this issue?

(You may skip this section if you are already convinced.)

- First is the evidence that medical errors do occur and the number of errors that occur (some of which I have explained here).
- Second is the culture of medicine that has traditionally not told patients about errors.
- Third is the research showing that the vast majority of patients do want to know about medical errors. (But of course that is not what some people from the medical community want to hear, and I have documented an example of misinformation here.)
- Fourth are the legal implications. Of course physicians don't want to end up in court. No one does. And unfortunately this has been cast as a "doctors verses lawyers" fight.
- Fifth, the public has developed the perception that when people use the civil justice system to seek compensation, they are evil and greedy. (I really don't want to start writing on that topic. But because it keeps coming up in discussions, I wrote a post titled "Warning: Say 'frivolous lawsuit' and I may smack you in the head". It was the anniversary of my father's death. I was a little on edge.)
- Sixth, just by the fact that someone is proposing a regulation, someone believes that something needs to be regulated. No one wants to be regulated by an outside force.
- Seventh, there is a substantial history of initiatives within some hospital systems to implement disclosure, and a shorter history of state laws concerning disclosure. There is much to learn from those experiences, but they each occurred in a specific context that may not easily translate to other contexts. (Here and here are links to videos from hospital leaders about their rather radical approaches to medical errors. And this is an

academic research paper from a University of Washington team that examined existing state laws.)

- Eighth, I think most everyone agrees that medical errors are bad and patient safety is good. But what to do when medical errors happen is a source of disagreement. One perspective is that errors needs to be kept closely guarded so that physicians are wiling to talk about errors with other physicians. The other perspective is that the best way to prevent more errors is to openly talk about them and have departments and institutions share strategies for error reduction.
- And finally, there is the increasing momentum of the patients' rights movement. (And yes, I definitely claim membership in that. So I am not unbiased. But I am also a scientific researcher, and I am doing my best to apply my critical thinking skills to this issue.)

My experience last week

Given the massively complicated nature of these issues, the legislative bill that my mother and I drafted last winter break is certainly not perfect. But it will be discussed in committee during the next Kansas legislative session, which begins in January.

In an effort to begin discussions with relevant organizations so that an improved version can be proposed that has a chance of being acceptable to all parties—healthcare providers, lawyers, and patients—I have reached out to these organizations. Last week I had a conference call with several people representing a couple organizations. (Yes, I am being intentionally vague.) That experience led to a new blog post, "A conference call that took a wrong turn". (Brief summary: There were some very good parts of that call. There were some very nasty parts. In response I wrote a post on my blog that was a little emotional.) When I first hung up the phone I was traumatized. Then the next day I was angry. Then for a couple days I was in a state of being perpetually pissed off. But now I am trying to move forward rationally. So I would like to examine how that conversation went, and what we might learn about communicating on topics that can get a little emotionally charged.

First, let me describe the context of the conference call: It was with individuals I have never met. It wasn't really a discussion; instead it was mostly just me responding to voices over the phone. The topic of the call (my family's legislative bill) had been established through email communications. The call lasted about 30–40 minutes. Two voices dominated the exchange, and I will call these Voice #1 and Voice #2.

The call started with me summarizing the various parts of the bill. I don't remember quite exactly what happened early in the call, but most of the call was an alternation between Voice #1 and Voice #2. There wasn't much of a coherent conversation, because the topics the voices were addressing were usually different.

Each time Voice #1 came on, I got a couple questions about parts of the bill. Occasionally Voice #1 had a brief comment on my responses, but nothing surprising. Voice #1 was always fairly calm, with just a hint of emotion when commenting on some parts of the bill thought to be impractical to

implement (or at least that is the sense I got). I liked Voice #1. I was smiling when I was talking to Voice #1. We knew we had differences at the beginning of the call, and we still had those differences at the end of the call. But we understood each other a bit better.

I had a very different experience with Voice #2. Voice #2 became rather impatient with me early in the call when I stumbled on my answer to a question about disclosure laws of other states. Partway through the call I was asked by another voice to give the backstory about what why my family wrote this bill. (I am happy to explain this, and there are some very predictable questions that people ask me. All that is fine. I realize that people are curious.) But Voice #2 was not satisfied with my answers, and this took the conversation off course. And a little ball of nasty came at me. But then Voice #1 came back on, and all was well for a while.

Then Voice #2 came back, with a bit bigger ball of nasty. At this point I was definitely not happy the way things were going, but I was trying to respond with answers as best I could. Then a couple bigger balls of nasty came at me, and I think that is the point at which I actually yelled into the phone. It totally shocked me. I don't think I have ever yelled into a phone before. (In fact, can't remember the last time I yelled at anyone. Undergrad? High school?) And then Voice #2 came across the line, exclaiming "THAT MAKES NO SENSE!!"

But then after a bit of silence Voice #1 came back on, and I returned to calmly explaining bits of the bill. (Except I was traumatized, of course.)

What can we learn from this?

Based on that experience, I have a few thoughts to offer on having conversations that could become emotionally charged. But first, let me state the obvious. When voices are raised there is no communication going on, because there is no listening going on. So of course what I was saying to Voice #2 didn't make sense. I couldn't get more than a sentence out of my mouth before I was getting hit with another ball of nasty—and of course those sentences weren't well thought-out because I was trying to rapidly respond to the nasty balls. And hey, this stuff is complicated. That's why my blog post responding to all this is so long.

So let's back up and examine this from two angles: How to be Voice #1 during a conversation, and warning signs that Voice #2 could erupt in the person you are speaking with.

Being Voice #1

- Seek to understand the other's viewpoint. For example I was asked which parts of the legislative bill were most important to me. That was an excellent question, because it let me know the other person was really trying to figure out my position.

- Confirm when you understand what the other is saying: At least once, Voice #1 said “I’ve got that” when I was explaining something about my family’s position on mandatory disclosure of harmful medical errors.
- Find common ground: (I can’t think of an example right now, but this just sounds like good advice.)
- And of course, stay calm. Pause before responding.

Warning signs of Voice #2

- Impatience with your responses to questions.
- A change in the tone, pitch, or volume of the other person’s voice that makes you a bit uncomfortable
- Taking the conversation off topic.

I really have no idea how to continue a rational conversation once Voice #2 emerges (or if this is even possible). I did at one point say that I believed the conversation was getting off topic, but it didn’t seem to help. Perhaps I should have restated the purpose of the conversation more firmly, because it is possible that Voice #2 had either forgotten or wasn’t aware of the purpose. Perhaps I should have asked Voice #1 if he/she agreed we needed to pause and get back on track?

And my final suggestion is to call out the people on your “side” if they get out of line. My impression of Voice #1 is slightly tainted by the lack of reaction to Voice #2.

Your suggestions?

So that’s my experience. Please share in the comments below your own suggestions for dealing with conversations that could become emotionally charged. And if you are aware of any resources that could be of help, let us know. We might be able to take these ideas and create a lesson for the Engage seminar course.
