



TALK

SCIENCE

TO ME

Learn how to slay the jargon and turn your research into stories that resonate beyond the lab.

BY BRIAN BUSENBARK

As an undergraduate student at Virginia Tech, Morgan Zumbaugh took a job cleaning glassware in a laboratory on campus for some extra cash. Eight years later, she left with her PhD.

Though she initially had no interest or background in scientific research, Zumbaugh was inquisitive. She began attending staff meetings and peppering others in the lab with questions about their work and the nature of the research. Those interactions helped lay the foundation for her future.

“They really piqued my interest and opened up opportunities for me,” says Zumbaugh, PhD, an assistant professor in the Animal Sciences and Industry Department at Kansas State University and a member of the APS Science Policy Committee. “But I really just fell into it, honestly.”



FINDING COMMUNICATION RESOURCES

Of course, it doesn't always work out this way. Complicated scientific concepts and research work can be difficult for lay audiences to grasp. Informing—much less inspiring—those less experienced with science calls for advanced communication skills. Traditionally, research institutions don't require any formalized curriculum or training to aid scientists in this endeavor.

"I wish there was a course on this; this is a gap in our field at most universities," says Jason Carter, PhD, dean of the Robbins College of Health and Human Sciences at Baylor University. "There are often scientific and technical communication programs in humanities departments, but a physiologist typically doesn't take these courses."

There are some exceptions: The University of Chicago and the Institute for Translational Medicine offer a nine-month certificate program in science communication, aimed at empowering researchers to write and speak more dynamically about their work. They also present three-day seminars covering these topics. Elsewhere, professors may steer their students toward communication courses offered on campus; Zumbaugh encourages her graduate students to take an agricultural communication class offered at Kansas State.

And while researchers have traditionally been able to share their findings in policymaker meetings on Capitol Hill or poster presentations at academic conferences, they can increasingly find novel opportunities to help them further hone their com-

munication skills. For example, the University of Florida sponsors "Talk Science with Me," a public outreach program that encourages casual conversations between the school's scientists and members of the public. Usually held in bars, coffee shops and libraries, these sessions offer researchers opportunities to discuss their work with small groups of people in an informal setting.

"People just sit down next to you and ask what you do," says Erica Dale, PhD, an assistant professor in the Department of Physiology and Aging at the University of Florida and a faculty member with the university's Breathing Research and Therapeutics (BREATHE) Center. "I've spoken with people from all education levels and have learned a lot just about meeting people where they are."

A prominent resource in this realm is the Alan Alda Center for Communicating Science, a collaboration between the renowned actor and Stony Brook University, with support from Brookhaven National Laboratory and Cold Spring Harbor Laboratory. Its aim is to train STEM and health care professionals to communicate more effectively using a blend of improvisational theater concepts and messaging strategies. Since its founding in 2009, more than 30,000 scientific experts have participated in the Alda Center's graduate and professional development programs.

"Improv works because it helps us connect with each other as humans," says Laura Lindenfeld, PhD, Alda Center executive director and dean of the School of Communication and Journalism at Stony Brook University. "It helps enhance people's curiosity about what the other person needs out of the communication."

FROM THE EXPERTS

Pitfalls to Avoid

Even experienced communicators are prone to lapses in judgment. Be sure to focus on sidestepping these common traps:



Curse of knowledge. Mastery of the subject matter may be your superpower, but it can be kryptonite for your communication skills.

Excessive use of jargon and needlessly technical content can alienate an audience and may even come off as arrogant.



Making assumptions. Regardless of your audience, it's a mistake to presume their knowledge base—even other scientists may not be well-versed in your specialized research area. Don't be afraid to level-set your approach with the audience. "It doesn't matter if I'm speaking with little kids or a senator, I always ask if they're familiar with my subject," Erica Dale, PhD, says.



Crowded slides. Known as "death by PowerPoint," boring, text-heavy slides are hard for people to digest and can tempt you to simply read them aloud, rather than engaging your audience. "If I'm in the audience, I lose attention if there are too many words on a slide versus images," Morgan Zumbaugh, PhD, says.



Closed-mindedness. It can be easy to get stuck in an echo chamber of ideas and become too entrenched in your own perspective. It's important to think of your communications as conversations with the audience and respect constructive criticism and alternate viewpoints.

5 KEYS TO EFFECTIVE COMMUNICATION

For most researchers and scientific lecturers, mastery of the content is the easy part. But how do you impart your message in a clear and compelling manner? Our experts say following these five guidelines will make any communication more effective:

1 Know your audience.

First and foremost, understanding your audience is key to successful communication. Who are they? Why are they listening (or reading), and what do they hope to learn from you? Being able to craft your message with an appreciation of your audience's vantage point is crucial. Even if the communication's format is one-way, try to think of it as a conversation.

"Communication is not like a spray paint can, where you can just shower someone with information and they automatically get it—that only leaves them with a paint-covered face," Lindenfeld says. "Whenever possible, imagine communication as an opportunity to connect and bridge a gap."

2 Lean on your network.

Resist the urge to go it alone. Instead, leverage those around you. Colleagues, mentors, students—even friends and family—can provide you with multiple vantage points to help you refine your message and approach. "Don't be a lone wolf," Carter says.

3 Align your message.

Finding a common link between your work and the audience's priorities will capture their interest. The Alda Center uses a fun exercise it calls "Hobby Speed Dating." Here's how it works: Scientists pair up and take turns role-playing as a hobbyist.

For example, one may say their hobby is knitting, and it's their partner's job to figure out how to relate their research to knitting to make it matter to their audience. "It's kind of silly and funny, but it's really important and helps move the conversation forward," Lindenfeld says.

4 Don't sweat it.

The fear of making a mistake while speaking in public can be paralyzing for some. As a result, they avoid those situations and never improve. No matter your level of preparation, verbal flubs or technical glitches will occur—don't let it derail or discourage you.

"Think about whenever someone has an awkward pause while giving a talk. You don't immediately think that it's really weird—rather, you have empathy for them," Dale says. "Just remember that everybody listening to you likely wants to hear what you're saying and is interested in your message."

5 Practice (and then practice some more).

There's no substitute for putting in the time rehearsing your communication. Whether it's getting live repetitions by talking with family and friends, smaller engagements like the "Talk Science with Me" sessions, or delivering in front of the mirror, practice is invaluable. Be sure to practice delivering your message for diverse types of audiences. One caveat: Don't just memorize your lines—you want to sound conversational, not scripted.

ADDRESSING IDEOLOGICAL CHALLENGES

Disseminating complicated scientific concepts to lay audiences effectively is an evergreen dilemma. An issue that has gained traction in recent

years, however, is communicating with audiences who have strongly held beliefs around science and academic research.

"One of our biggest challenges right now is the hyperpolarized political state we're in," Carter says. "In many ways, we've lost our ability to agree to disagree, and my hope is that we never give up on that—it's what defines humanity."

Carter adds that he prepares his students not to become discouraged in the face of disagreements. Fortunately, many of the same principles used to communicate complex scientific concepts also apply to addressing opposing viewpoints: understanding and empathizing where someone is coming from, finding common ground, remaining calm and practicing your delivery.

For Dale, this approach has resulted in fruitful conversations with congressional staffers who had originally advocated for cutting funding for scientific research. In Zumbaugh's case, it's led to common ground with vegetarians around her work researching how the metabolism of skeletal muscle affects livestock production efficiency.

"If you choose not to eat meat for environmental reasons, then we could talk about how my research is ultimately trying to figure out how to make meat for other people with less of an environmental impact," Zumbaugh says.

The most important piece, the experts agree, is to not shut down or avoid potentially difficult conversations altogether for fear of encountering disagreement. "At the core of all of this is building trust. You can disagree with someone, but if you trust them, you'll still listen to them," Lindenfeld says. "The solution is not to avoid communicating, but to communicate well." ☐