Science Societies

Translating your research through effective science communication

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Fernanda Krupek making a YouTube video while in the field. Photo courtesy of Osler Ortez.

Science communication is central to science that benefits society. However, science communication training during graduate school is often limited to communication among peer audiences through lab reports, peer-reviewed publications, dissertations, and professional presentations. If actively searched, graduate school can offer several opportunities to incorporate science communication skills and broaden audiences to include the general public. Based on our personal experiences as graduate students, we offer the following insights to encourage you to translate your research, moving it out of the ivory tower to those who are decision-makers at different levels and need it the most.

Redefine Types of Writing, Verbal Communication

To earn a graduate degree, students are expected to primarily conduct research and publish in scientific journals while having light teaching and service loads. But we do not see why this system could not at least broaden its definition of “publishing” and “presenting” to include writing and speech for non-academic audiences and about a wider range of topics than just students’ subfield. In the real world, these types of writing and speaking are a significant accomplishment, a potential public service as academics bring their expertise to vital concerns, and a service to higher education at a time of public mistrust in academe.

According to Gallup polls, in 2016, less than 5% of the American public identified agricultural and natural resource topics as areas of their top concern (

https://bit.ly/3ugrPJc), which should be alarming to researchers! It is time to reimagine our graduate school experiences, looking outside the walls of the university and connecting scholarly training to the vast array of career options open to graduates. Science communication is one way to unlock and broaden our graduate school experiences practically as well as intellectually.

How Do You Begin Translating Your Research?

1. Shift the Order of What is Communicated

First, it is important to keep in mind that we are trained to communicate our science to other research community members using a particular structure, and that structure needs to be completely shifted when communicating with the public. We should start with the most important information (key findings), then the "so what?" that explains why the findings matter, followed by the supporting details that let to the key findings (Figure 1).

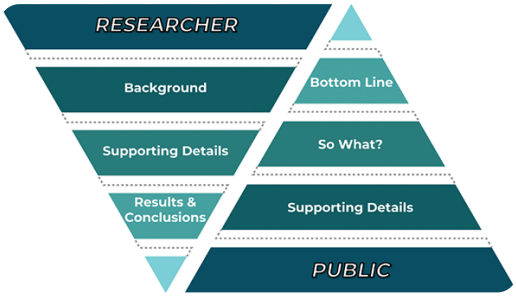


Figure 1. *When communicating science to the public, the structure we normally use in communicating to other researchers needs to be completely shifted. Source: Adapted from Nancy Baron's Escape from the Ivory Tower.*

2. Discover Who Is Already Talking and What Is Missing

The next step is to identify the channels currently available to communicate the topic you are researching. In order to position yourself on the right channel, you should self-assess your communication goals: to educate, to advocate, to raise awareness, to build trust, to influence policy or research, to encourage change, to be part of a dialogue, to name just a few.

To help you get started, we identified possible channels that have allowed us to translate our science:

The* Sustainable, Secure Food *blog (**https://sustainable-secure-food-blog.com**) is sponsored and written by ASA and CSSA members on topics related to food, fiber (cotton, hemp), and fuel (biofuel) production.

The* Soils Matter *blog (**https://soilsmatter.wordpress.com/**) is sponsored and written by SSSA members on all aspects of soil ecosystem services.

The Societies'* Field, Lab, Earth *podcast (**www.crops.org/publications/podcast**) recently launched the Grad and Undergrad Student Highlight, a five-minute recording at the end of each episode where students share their current research and a dream research project or area of study. To be considered for the show, fill out this form (**https://forms.gle/GdTZDjihV3ACoT2H9**) or contact Send Message.

The Podcast Guest Collaboration Community on Facebook (**https://bit.ly/3a4WuCu**) matches students looking to appear as a guest on a podcast or looking to find guests for a podcast you host. Other speaking platforms (Facebook Lives, YouTube videos, etc.) are welcome too.

Agro Connection (**https://agroconnection.net**) is a recently launched extension program (with YouTube videos, podcasts and other digital communication) that provides on-the-ground information about U.S. agriculture to farmers in South America and other Spanish/Portuguese speaking stakeholders. Run by graduate students and early career professionals, the program invites Spanish/Portuguese speaking professionals to be featured in several ways (see **https://bit.ly/3bBCszX**).

Extension-related channels are another way to communicate your research to different stakeholders. Many universities have a central resource (e.g., website, blog, Twitter, on-farm meetings) for extension information on crop production and pest management. Contact extension educators and specialists at your university for more information.

Crops & Soils magazine (**https://bit.ly/3nvGTPG**) is a great way to get your research down to the farm audience by translating it for Certified Crop Advisers (CCAs) who advise their farmer-clients. Contact Send Message.

After identifying channels people are currently using to talk about your research topic, ask yourself: "What is missing from these posts/conversations/platforms?" and "What could I add?"

3. Be Bold and Believe in Your Value

Trust yourself in your work and find a way to express your research to the public. The next step is to find ways to improve communication skills by:



Carlos Pires discussing a podcast project. Photo courtesy of Wagner

Squizani.

Knowing your audience: Aligned with your goals, you need to think about your audience and the people that you want to reach out. Think carefully. This is a significant step. It will drive the way you communicate. It is important to know your audience because you need to formulate your story based on their background. Do a little research on your audience and select the **part of your work that fits them**. For example, if you are communicating with farmers, it is better to talk about yield response or cost-effectiveness rather than the details of complex algorithms.

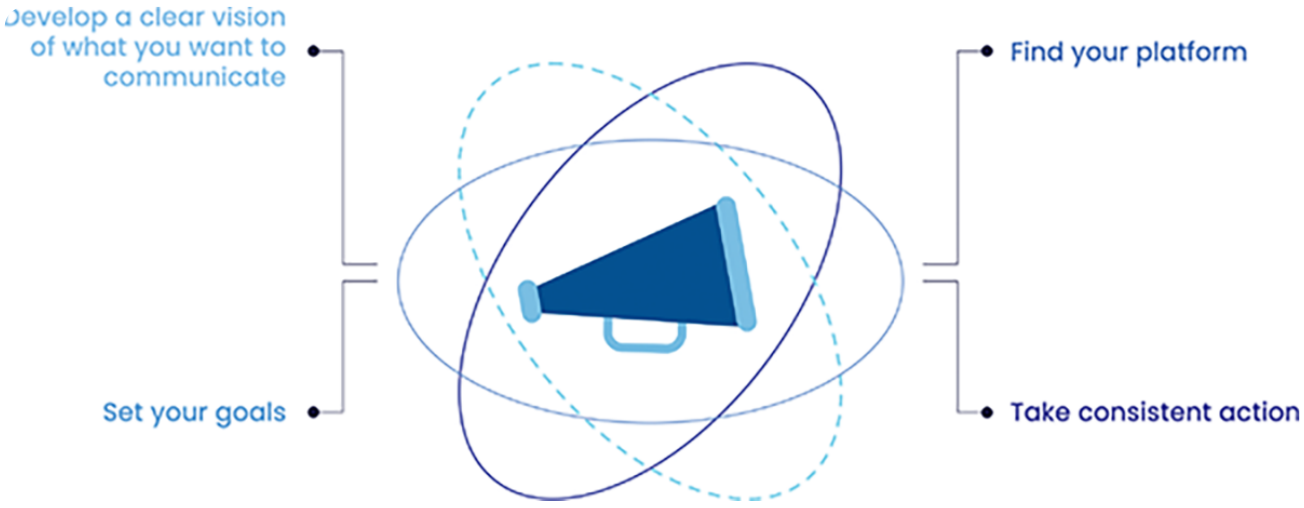
Prioritizing the important information: The first thing to consider here is that you are limited by time. In addition, people do not want to listen to the technical details of a protocol; rather, they want to hear a story that can be easily understood and can be related. So, you need to exercise making up the story and prioritizing your major findings.

Being relatable and avoiding jargon: Engage the audience and ask them to share their opinion. This a great way to make the talk interesting and informative. Taking questions from the audience or responding to online questions or comments makes the communication more effective. Further, expressing the story with emotions is preferred over reading a script straightforwardly. Effective communication avoids using exotic words, instead using a common term known to most of the audience. **Jargon builds roadblocks**, lacking the bridges we desire when communicating about our very important research. Do you want to know how the vocabulary you use is accessible to a broad audience? This automated jargon identification program can help you: **http://scienceandpublic.com/**. For this audience, we want to have **"readability" at the 8th- to 10th-grade level** because that is the reading level of the average college graduate.

Using visuals: Since "a picture speaks 1,000 words," explaining your results using appropriate graphs and charts could be more effective compared with a huge dataset or many words. The **Guild of Natural Science Illustrators**, an association of individuals who communicate science visually, is also a great resource to connect you with those who promote, educate, and celebrate visual communication of science. Learn more about photography in this *CSA News* magazine article: **https://bit.ly/3a4IN6B**.

4. Seize the Opportunity

Start now, right where you are—not just when you publish your peer-reviewed article. Just seize on the opportunity, take on challenges, and remember that done is better than perfect. For effective communication, always seek relationships over followers. Bear in mind that you are dealing with people, so be human, be yourself, and engage. If you are unsure of how to start, follow these tips for a mild kickoff: (1) Develop a clear vision of what you want to communicate, (2) set your goals, (3) find your platform, and most importantly (4) take consistent actions!



Follow these steps in communicating your science.

Part of the charm of science communication is engaging with your public, and engagement means questions. Table 1 showcases some **answering techniques from**

Susan Fisk, Public and Science Communications Director for ASA, CSSA, and SSSA. Always start by acknowledging the question, follow with the main message, and complete with the main takeaways.

The Societies are also offering fully virtual, multimedia communications training for our members with special pricing for graduate students, thanks to a grant from Agronomic Science Foundation, in summer and winter. More details are available at:

Acknowledge	Main Message	Complete
I understand your concern…	There are X main points…	Once again…
Is what you're asking…	There are a few things I'd like to share first…	The thing everyone should remember is…
If I understand you correctly…	There are several key issues…	The main take away is…
	The bigger concern to me is…	At the end of the day…
	I have a different viewpoint…	
	The question really is…	

Table 1. *When answering questions, always start by acknowledging the question, follow with the main message, and complete with the main takeaways.*

- **www.agronomy.org/membership/toolkits-for-members**
- **www.crops.org/membership/toolkits-for-members**
- **www.soils.org/membership/toolkits-for-members**

Intimidated by Translating Your Research?

The following questions can help you increase confidence in translating your research

- What is missing from popular media's understanding of this research area?
- In what ways could my training, research, or knowledge fill this gap?
- Who could benefit from the information I have?
- What avenues of translation are most comfortable to me?
- How could translating my research help me to achieve my goals?

- How could translating my research help people to have a better life?

“One benefit of improving your science communication is that it helps you write grants that are easier to understand for your funding bodies. Even including some of your photographic comparisons can liven up a grant and get it more attention.”

—Susan Fisk, Director of Public and Science Communications for ACSESS

Even though science communication is considered extension or outreach, one of the foundational pillars of land grant institutions, graduate students might feel unprepared to communicate to the public or do not see it as their responsibility. In a somewhat cyclical relationship, what the media covers will reflect what the public typically perceives as important. There is not a one-size-fits-all way to translate our research. We invite our fellow graduate students to use these insights as a starting point to actively place their research on the media’s agenda to deliver accurate findings, increase research’s saliency, and in the long term, increase public interest, support, and government funds.

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