

CHAPTER 7

BRINGING SCIENTISTS TO THE PEOPLE

Research Communication Training: A First Step for Science Events

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Abstract: This chapter discusses the idea of training scientists and researchers as a direct method of communicating with the general public. It outlines some of the issues that arise when teaching scientists to translate their work to an audience outside of their sub discipline

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1. BRINGING SCIENCE TO THE PEOPLE, BY BRINGING SCIENTISTS TO THE PEOPLE

As an invited speaker for EUSCEA (European Union Science Communication Events Association), I considered the organization's slogan of "Bringing Science to the People." I considered how my work provides a match of EUSCEA's need for scientists to effectively engage with the general public with my own need to discover additional methods to connect research communication training to the general public.

1.1. Personal and Workshop Background

My specific experience with science communication has been as the former Director of Stanford University's Research Communication Program. Our goal was to teach PhD-level researchers how to communicate the nature and significance of their work to audiences outside of their (sub)specialties. From a pilot test of 12 PhD students in 1999, the program grew to teach over 1000 PhD students, postdoctoral scholars, research staff, and faculty from over 85 disciplines at institutions in the US, Canada,



Figure 1. The result of training scientists: Can these talks directly interface to a science event?

Sweden, Norway, Denmark, South Africa, and Japan. Along with teaching, we collaborated with communication faculties across the US to research how experts learn to communicate complex information to general audiences. The following sections briefly outline what we teach in our basic workshops, along with providing some practical advice on lessons learned.

2. METHODOLOGY OF OUR WORKSHOPS

The goal of a basic research communication workshop is to enable scientists to describe their work in 750 words, understandable to a 17–18 year old student. In the US, this would be equivalent to a senior in high school, or a freshman (first year) at a college or university.

The 750 word statement is broken down into two parts: the Elevator Talk (abstract), and the Hallway Talk (body). After several rounds of peer review and instructor support, this “final product” is complete, and often ready to be converted to a 5–10 minute presentation. It is important, however, to work on the content first, which is the reason why we emphasize working on a written statement first.

One of the first things we do is dispel the myths participants bring to the workshop. First, people tend to think that translating their work for a different audience is going to be easy and not take a lot of time. After our first exercise (see section 2.1), participants realize that this is not easy at all!

2.1. The Elevator Talk

The written Elevator Talk is approximately 150 words in length, and should explain a person’s field of study, exactly what he/she does, and why it is important in a broader context. This is easier said than done!

Why the name Elevator Talk? It helps to imagine that you have walked into an elevator, and someone asks, “So, what do you do?” This elevator is not in a very tall building, nor is it particularly slow. You might have 30 seconds – what would you say? We have found the analogy of an elevator to be immediately understood, regardless of where the workshop is taught.

Before a workshop starts, participants are given detailed instructions on how to develop an elevator talk, with examples and issues to consider. A few points that we try to emphasize are:

1. Include only one technical term in this talk – maximum.
2. Use an analogy to clarify a concept; or to tell a story. Look for something concrete that is easily understandable to a general audience, and use that example to transition to a more abstract theory.
3. Avoid giving nothing but background information about the research. Use action words to describe exactly what is being done.
4. Be sure to situate the work in a larger context. Why is this work important?

When all participants meet face to face, they are placed into groups of two or three. Each participant reads his or her Elevator Talk aloud, and receives guided feedback from peers (an example of this feedback would be making note of technical terms that were not understood). In this exercise, it is important to place people together from fields as diverse as possible. For example, we have learned that placing an electrical engineer, a physicist, and a mathematician in a group does not work - they understand each other's technical terms at a basic level.

2.1.1. Detecting Jargon

Here is an example Elevator Talk brought to a workshop:

“I model the diffusion of drugs through the skin, using a method called finite elements. This is to understand better how transdermal drug delivery works and also to help improve their performance. The complex structure of the skin makes this quite challenging, and I’m looking at the diffusion on both molecular scales to molecular dynamics simulations and also at the macroscopic scale through finite element calculations.”

As mentioned previously, one of the first things to work on in a group setting is to identify technical terms. For an Elevator Talk, we require a maximum of one technical term (preferably none). If we highlight the first two sentences, we can see that there are four technical terms:

“I model the **diffusion** of drugs through the skin, using a method called **finite elements**. This is to understand better how **transdermal** drug delivery works and also to help improve their performance.”

While talking to the author of this Elevator Talk, I put aside the writing and asked her about the work she did. Immediately, she mentioned transdermal drug delivery, but gave an example of a person who wants to stop smoking by wearing a nicotine patch. This patch delivers drugs through the skin, and that is what transdermal means. This is an example of using something concrete (a nicotine patch) that is generally understandable by much of the general public, and using that to help visualize the specific research she does (using a computer to visualize how transdermal delivery works). I suggested that she revise her Elevator Talk accordingly.

2.1.2. *Less is (not always) more*

Here's another example of an Elevator Talk, but we will stop at the first sentence.

"I study the effects of plant secondary compounds on herbivory."

This may be concise, but **plant secondary compounds** and **herbivory** are technical terms. This person has lost the audience after the first sentence!

When faced with the task of being concise, researchers have a tendency to "pack in" as much information as possible. This is not the point of an Elevator Talk, and we challenge participants to continue to prioritize their work. If there is only one thing the audience can take away from your written statement or presentation, what would it be?

In this case, I sat down with the student and started by asking him what he meant by plant secondary compounds. Without looking at his writing, he asked me if I had ever wondered why some plants taste bitter? Some plants do this to protect themselves from being eaten. This is what the research was about – the effects of bitter plants on animal dietary preferences.

"Have you ever wondered why certain plants taste really bitter? It's because they produce these bitter compounds to protect their leaves from being eaten. This explains why certain plants are eaten more than others."

The first sentence was rewritten into three. Yes, it may be longer, but a few more words make the introduction engaging and concise.

2.1.3. *Progress, Not Perfection*

Building on the last example, I continue to emphasize that researchers cannot impart everything they know about their work in one talk – or two talks, or even over the course of a typical university class. Experts tend to forget that it has taken them at least 6–10 years to gain the knowledge that they have about a subject – where a layperson might have the equivalent of six months to one year of experience in the more general topic.

I continue to stress that it is important that even if you manage to advance the knowledge of your research just a notch, you have done more than enough for one

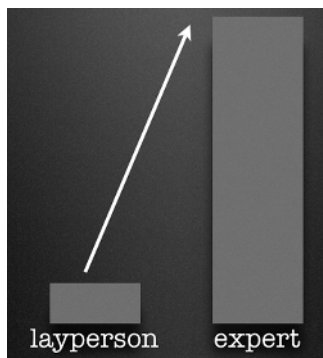


Figure 2. What experts think they can impart in one talk

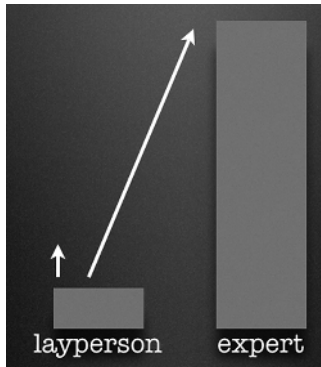


Figure 3. The reality of the situation. Aim to inform in incremental steps!

setting. I use these figures to help researchers visualize what I am saying, and continue to emphasize this as they write and revise.

2.2. The Hallway Talk

After spending several hours revising the Elevator Talk, it is important to “keep going.” In most cases, it does not take long for a researcher to be able to create a fantastic Elevator Talk. However, the second one asks for more information, researchers often return to “dissertation speak” – and one can quickly watch the recipient’s eyes glaze over!

For the Hallway Talk, we assume that a researcher has given a great story in the elevator. The doors open to a hallway, and the person who originally asked, “So, what do you do?” now says, “That was interesting – tell me more!”

In many aspects, writing the Hallway Talk is much easier. We have found that the Elevator Talk lends itself to being a good outline for a Hallway Talk, and that researchers can easily take each sentence from the former and expand to a paragraph each for the latter. We also stress focusing on methodology, and explaining work in the active voice as much as possible. For scientists and engineers who are grounded in writing passively, this also proves to be difficult.

2.3. Converting Writing to Speaking

After completing several iterations of an Elevator and Hallway Talk, it is easier to convert the text to a presentation. We have found that Elevator Talks convert well to a 30–60 second presentation or introduction, while the Hallway Talk can range from three to ten minutes.

Similar to what we do in the Elevator Talk training, we will go through several rounds of peer review to deal with content (and then presentation style) issues. However, the focus is mostly on refining the content so that it is understandable first and foremost.

3. OUTREACH: THE NEXT FRONTIER

Writing the complete Elevator + Hallway Talk takes time, of which researchers have precious little. While peer review within a workshop does assist in speeding up the process, it is very helpful to receive feedback from a target lay audience. As mentioned earlier, the Stanford program focused on 17–18 year old students as the audience to write to. We developed a curriculum that gave these high school and college students a chance to critically review the Elevator + Hallway Talk, with much success. Researchers found this feedback more valuable than what they received from their peers, and high school/college students learned critical reviewing skills. They also took the task seriously, as most were excited to realize that they might possibly make a difference in what a PhD-level person would say!

Another form of outreach was to have researchers talk about their work in public fora at a university. I will never forget a pilot scheme we put together, where researchers from medicine, history, and engineering came together to talk about their work. One journalist approached me afterwards and said that this was the first time that she understood enough to ask intelligent questions!

These efforts were merely a start at outreach activities, and it excites me to be able to collaborate with a group like EUSCEA, who has built a large knowledge base of such activities. My hope is that we can continue to use this training as a bridge for more scientific researchers to connect with the general public.