Communicating Science to Non-Scientific Audiences

Career Development Workshop
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American Association for the Advancement of Science
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Developing a Dissemination Plan

WHO? Get to know your stakeholders

- **Who are your stakeholders?** A stakeholder is a person or group that can affect or be affected by your research. When thinking about your stakeholders, consider the following:
  - What are their needs and goals?
  - What is their level of understanding and interest in your topic?
  - What are their prior experiences with your topic?
  - What are their concerns about your topic?
  - What resources do they use to get information about your topic?

WHY? Identify dissemination goals for each stakeholder

Identify your dissemination goal. That is, why are you disseminating? What are you trying to accomplish through dissemination? Generally speaking, there are three broad goals of dissemination (Harmsworth, Turpin, et al. 2001):

1. **Dissemination for awareness/interest:** Raising stakeholders’ awareness or interest in your work.
2. **Dissemination for understanding:** Promoting stakeholders’ deeper understanding of your work.
3. **Dissemination for action:** Motivating changes in stakeholders’ practices or policies that are informed by your work.

WHAT, HOW/WHERE, WHEN? Identify the following for each stakeholder

- Your key message
- Your dissemination channels (e.g., conference, parenting magazine article, radio, science fair, establishing partnerships with community organizations) and particular vehicle.
- The best timing for the dissemination to take place with the given stakeholder.

DID YOU ACHIEVE YOUR GOAL? Develop an evaluation plan

- Identify how you might evaluate the influence of your dissemination on stakeholders’ awareness, interest, appreciation, knowledge, or action.

Each stakeholder has different needs and goals. Thus, your message, channels, and timing must be tailored to them. Avoid using stock presentations; they are unlikely to meet the audience needs and therefore may reduce your impact.


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Tips for communicating with the public

- **Speak simply and clearly.** Think about how you would explain your research to a friend or relative with no scientific background. Avoid jargon (“smell” vs. “olfaction”) and academic speak (“It had trouble staying upright” vs. “It experienced difficulty maintaining a vertical orientation”). Use vivid, specific details, ("The asteroid was as heavy as a battleship and looked like two ashen golf balls fused together" vs. “The asteroid was large and oddly shaped.”) In general, speak like you would to a stranger at a party, not like you would at a scientific conference.

- **Give the 1000-foot view.** You don’t need to describe every nuance of your work. Stick to the most relevant experiments and the biggest, most compelling findings.

- **Don’t forget the “So what?”** What implications or applications of your work would interest the stranger on the street? If you work in biomedicine, how might your findings translate to treating or understanding specific diseases? If you’re an astronomer, how might your work inform our understanding of how life evolved on earth? Even if there are no immediate applications, it’s ok to speculate!

How to break down your research

- Scientists can spend years on a single study, involving dozens of experiments and just as many dead ends. To translate all of this into a two-minute elevator pitch, ask yourself the following five questions:
  - **What do we know?** What was known in your field before you started your project? *When leeches attach to your skin, they inject anti-inflammatory compounds. Scientists have successfully used the worms to treat patients with arthritic knees.*
  - **What don’t we know?** What mystery were you trying to solve with your project? *We wanted to find out if leeches could treat thumb arthritis as well.*
  - **What did you do?** What experiments did you carry out, in brief? *We recruited 100 women in their 60’s with thumb arthritis, and gave half a common painkiller and the other half leech therapy on their thumbs three times a day.*
  - **What did you find?** What were your results, in brief? *A week after they were treated, leeched patients rated their thumb pain less than half as intense as those who received the painkiller, and their grip strength had improved by 36%, versus only 7% in the drug group.*
  - **Why do we care?** What are the implications/applications of your work (i.e. what’s the “So what?”) *Leeches could be a powerful new way to treat a variety of types of arthritis, w/o the unpleasant side effects of drugs.*

Other tips

- **Multimedia:** A picture or a movie—especially a user-friendly one—is worth 1,000 words.
- **Hype:** It’s fine to be excited about your work, but be careful about overhyping. By the same token, don’t be too modest—under-hyping is bad too!
- **Promotion:** Don’t be shy about promoting your work. If you think you’ve made a big discovery that will be of interest to the general public, contact your university’s press office—or contact a trusted reporter directly.

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Communicating with Practitioners

(In my case, Early Learning Professionals)

Choose an area of focus:

- What are the hot topics in the early learning community?
- What information do practitioners say they need?
- What questions do you get from the public?

Establish learning goals:

- What is the one-sentence take-home message?
- How does this information fit within the framework of users’ existing knowledge?
- How could professionals use this in their work?
- What visuals and real-world examples will best aid learning?

Develop the package of materials:

- Use accessible language (8th grade reading level, at most) in a conversational tone (try http://www.hemingwayapp.com/)
- Use analogies to relate complex concepts to familiar phenomena
- Use real-world examples and vibrant visuals

Test and refine the message:

- Collect data on your communication strategies. Both quantitative and qualitative data can help refine the message.
- Avoid a top-down approach. Develop meaningful and authentic relationships with communities and ask them to help you co-create messages and materials.
- Continually ask end-users what works and what doesn’t. Accept their responses and use their insight to make the message better. Adopt a model of continuous improvement.
Using Education Research, Policy and Practice to Improve Schools

Since the opening of the first U.S. public high school in 1820, our knowledge of how people learn has expanded dramatically. With the passing of the Every Student Succeeds Act (ESSA) in December 2015, many policymakers and educators want to use the new opportunities available to them to better reflect science of learning research in their policy decisions. In order for those decisions to produce high quality education for students, particularly for young people who are historically underserved, it is essential that policymakers build relationships with researchers and practitioners to ensure informed decision-making, to positively affect the classroom from teaching social and emotional learning skills in the classroom to incorporating measures of noncognitive skills in accountability systems.

Better aligning the U.S. education system with scientific research will benefit all students, particularly those who traditionally are underserved and need support.

The Alliance for Excellent Education (the Alliance) understands that practitioner capacity and effective communication networks between educators and researchers must develop before new knowledge from the science of learning can inform changes in policy and practice that will impact reform within traditional schools and districts. Only with a well-established body of research, informed practitioners, and supportive policy, will the science of learning become as influential in adolescent education as it has for early childhood education.

The Alliance will focus on building the resources and relationships necessary for science of learning career, and citizenship, thereby closing education achievement and opportunity gaps. The Alliance will focus on the four action areas outlined below.

**EMPHASIZE**
The equity imperative for science of learning and the need for continued research

**TRANSLATE**
Science of learning research findings relevant to the education of adolescents and underserved populations

**RECOMMEND**
Policies and practices informed by science of learning research and/or building capacity for necessary research

**PROMOTE**
Mutually beneficial collaborations between researchers, policymakers, and practitioners for the purpose of developing highly effective teachers and/or improving student outcomes
Section 8101(21)(A) of the ESEA defines an evidence-based intervention as being supported by strong evidence, moderate evidence, promising evidence, or evidence that demonstrates a rationale.

Types of Evidence

1. Strong Evidence
   - Study Design - At least one experimental study – randomized control trial
   - Favorable Effects - Demonstrates statistically significant and positive effect of intervention on student outcome
   - Sample Size and Overlap - Large sample and a multi-site sample, overlapping with populations and setting proposed to receive the intervention

2. Moderate Evidence
   - Study Design - At least one quasi-experimental Study - not a random sample
   - Favorable Effects - Demonstrates statistically significant and positive effect of intervention on student outcome
   - Sample Size and Overlap - Large sample and a multi-site sample, overlapping with population or setting proposed to receive the intervention

3. Promising Evidence Study Design
   - Study Design - At least one correlational study
   - Favorable Effects - Demonstrates statistically significant and positive effect of intervention on student outcome
   - Sample Size and Overlap - Not Available

4. Demonstrates a Rationale
   - Study Design - Provides a well-specified logic model informed by research or evaluation
   - Favorable Effects - Relevant research or an evaluation that suggests that the intervention is likely to improve a student outcome
   - Sample Size and Overlap - Not Available

For additional information about the Alliance’s work around the science of learning, visit www.all4ed.org/issues/science-of-learning/.

The Alliance for Excellent Education is a Washington, DC–based national policy, practice, and advocacy organization dedicated to ensuring that all students, particularly those traditionally underserved, graduate from high school ready for success in college, a career, and citizenship. www.all4ed.org

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Communicating with Policymakers

CHANNELS

• Write, call, or meet with elected officials directly (https://www.usa.gov/elected-officials)
• Submit a public comment (e.g., https://www.regulations.gov/)
• Provide comments at congressional briefings
• Participate in congressional hearings or provide expert testimony
• Write research-informing pieces for publication (op-ed, newsletters, blogs)
• Work with knowledge intermediaries to write policy briefs, collective public statements, or letters to congress (e.g., AAAS, SRCD, APA, RAND)
• Participate in policy or practice-focused conferences or webinars (e.g., Zero to Three)

RESOURCES

• Stay informed about policy
• Connect directly to policymakers (e.g., PolicyWatch, govtrack.us, Federal Registrar, legislative committees mailing lists, elected officials or agency mailing lists)
• Connect with knowledge intermediaries (e.g., professional societies, think tanks, coalitions, advocacy groups, funders, university press offices, etc.) who monitor policy activities, advocate for science, produce research briefs and organizer briefings. A few examples are listed below.
  ▪ Society for Research in Child Development Policy Updates, Briefs, & Briefings: http://srcd.org/policy-media
  ▪ AAAS Policy Updates and Advocacy Activities: https://www.aaas.org/informing-policy, https://www.aaas.org/first100days
  ▪ Federation of Associations in Behavioral and Brain Sciences: https://www.fabbs.org/about/
• How to write a policy brief: www.researchtoaction.org/wp-content/uploads/2014/10/PBWeekLauraFCfinal.pdf
• How to organize a congressional briefing: http://researchcaucus.org/2017-caucus-briefing-schedule/
• Tips on writing congress: http://www.citizenredress.com/WriteCongress2.html

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INTERNSHIP AND FELLOWSHIP OPPORTUNITIES

Executive Branch Internships

- NIH: http://www.jobs.nih.gov/intern/
- DOJ: http://www.usdoj.gov/opa/internopportunities.htm
- USAID: http://www.sph.umich.edu/pfps/gap/gap.htm
- CDC: http://www.cdc.gov/Fellowships/
- NSF: http://www.nsfgrfp.org/

Legislative Branch Internships and Jobs

- Congress Roll Call Jobs, Politico, and http://www.hillzoo.com/

Judicial Branch Internships and Jobs

- Federal Judicial Center: http://www.uscourts.gov/

Postdoctoral and Mid-Career Fellowships:

- AAAS fellowship
- APA fellowship
- NIH internship
- SRCD fellowship
- Presidential Management Fellowship
- ELP
- Pew Leadership Year
- Head Start Fellows
- National Academy of Sciences Fellowship
- SPSSI
- State Policy Fellowship in Early Learning

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