



# **RISE January 2009 Public Communication Internship Formative Evaluation Elizabeth Kunz Kollmann August 2009**

## **Introduction**

The following summary provides an overview of the findings from the formative evaluation of the RISE Public Communication Internship conducted at the Museum of Science from January 20-23, 2009. The internship was created as a result of a partnership between the Strategic Projects Department at the Museum of Science and the Nanoscale Science and Engineering Center at Harvard University. The goals for the internship as provided by the intern coordinator were as follows:

1. To provide early-career researchers with specific knowledge and skills for the gradual practice and improvement of their capacity for effective science communication and public engagement;
2. To provide enhanced opportunities for science museum audiences to come into direct contact with young and enthusiastic researchers who can also serve as role models for young people considering science careers;
3. To provide science museum staff with access to experts in current research, who may be able to consult on programs and exhibits; and
4. To help foster a new generation of scientists and engineers with life-long interest in engagement of students and public audiences in the ongoing process and results of research.

The museum intern coordinator also provided an agenda for the program that can be found in Appendix A.

## **Methods**

The purpose of this formative evaluation was to collect feedback from the internship stakeholders (the university intern coordinator, museum intern coordinator, and interns) about their experiences with the RISE Public Communication Internship to allow the Strategic Projects Department to make informed changes to the program. Therefore, the data collection methods utilized as a part of this evaluation included the following:

- Intern Pre-Survey: On the first day of the internship, all four interns were asked to complete a survey which included the following questions: 1) their demographics (gender, age, races/ethnicities, disabilities); 2) how long have they have been involved in research; 3) why did they decide to attend the internship; 4) what did they hope to learn; 5) what other science communication/education programs they have participated in; 6) how comfortable did they feel presenting their research to public audiences; and 7) why did they feel it is important for scientists to learn to present their research to others.
- Daily Intern Debrief: At the end of each day, the museum intern coordinator asked the interns questions about their experiences in order to adjust the internship to meet their needs. The questions that were asked included the following: 1) what activities did the interns enjoy most that day; 2) what did they learn that day; 3) which of the day's activities or resources best helped them to address their internship goals; 4) what questions did the interns still have; and 5) what would they still like to learn more about.

- Intern Post-Survey: On the last day of the internship, all four interns were asked to complete a survey which included the following questions: 1) how engaging did they feel the different aspects of the internship were; 2) what did they value most about the internship; 3) how did the internship differ from their expectations; 4) what did they learn from the internship; 5) how do they hope to use what they learned in their work; and 6) what improvements would they suggest for the internship.
- Intern Follow-Up Survey: Two months after the completion of the internship, interns were contacted and asked to fill out a short follow-up survey which included the following questions: 1) what were their most favorite and least favorite parts of the internship; 2) what was the most valuable aspect of participating in the internship; 3) how has the information from the internship influenced their work; and 4) how has the internship affected the science outreach component of their job. Two of the four interns completed this survey.
- Museum Intern Coordinator Debrief: After the completion of the internship, the museum intern coordinator was asked to reflect about the internship by answering the following questions: 1) what were indicators of success; 2) what preparation methods is it important to use for the next internship; 3) what changes need to be made to the planning process; 4) what about the agenda and content of the internship should stay the same and should change; 5) what did the interns most and least value about the internship; and 6) what did the interns need more help with.
- University Intern Coordinator Debrief: Two months after the internship, the university intern coordinator from the Nanoscale Science and Engineering Center at Harvard University was contacted to provide feedback about the internship. Questions posed to the university intern coordinator during the debrief included the following: 1) what are the benefits and drawbacks to having researchers participate in the internship; 2) what did the interns value most and least about the internship; 3) what did the interns take away from the internship and how did it differ from what you hoped; and 4) what changes need to be made to the internship so that interns take away what is most important.

The daily intern debrief and the museum intern coordinator debrief were created to be self-reflection tools for the museum intern coordinator and were not collected by the evaluator. This allowed the museum intern coordinator to think about his own practice and the needs of the interns and make quick changes during the internship as needed. Because these two debriefs were solely for the use of the museum intern coordinator and were not collected directly by the evaluator, they are not included in this evaluation report.

## **Findings**

In total, the university intern coordinator recruited four people from the Nanoscale Science and Engineering Center at Harvard University to take part in the internship at the Museum of Science. The case studies below summarize the feedback collected from the university intern coordinator and four interns about the January 2009 internship.

### University Intern Coordinator

The university intern coordinator participates in the internship because it is a “very valuable experience for grad students and post-docs if they can make the time... [and an] important professional development opportunity.” She said her goal for the internship is to have researchers who “become better communicators” and have “increased confidence in communicating.” She feels that the internship achieves these goals because it “is small enough and flexible enough that participants get something that’s tailored to each skill level.” She appreciates that because of the internship “now,

when I have a high school or middle school group come to campus, I have a core of people that I can depend upon... [who I] know won't make [science] ridiculously hard for the audience to understand."

Despite these benefits of the internship, the university intern coordinator does have some concerns. First of all, she said that one of her main challenges is recruiting participants because "it's a big time commitment and takes them away from their research. It's hard to convince people to commit that time." She is also worried that the loss of the museum intern coordinator will affect the internship because it is "very important to maintain continuity in the quality of internship." In addition, she feels that the internship could be improved if there was "...more follow-up to give the students more opportunities to make what they've started happen."

#### Intern #1

Intern #1 was an Asian American/White male between the ages of 18 and 24 years old who has been involved in graduate/post-graduate level research for less than one year. He said that it is important for scientists to learn how to present their research to others because "I believe that the sciences will stagnate without regular interaction with people in other disciplines." However, intern #1 has only had limited experience in communicating science to the public in the past including writing "an e-newsletter article related to my research" for Harvard's Science in the News and helping out with "Professor [X]'s Holiday lecture at Harvard." In the future, he plans to continue his involvement with science communication by "assist[ing] with 'science cafes'" for Science in the News and possibly volunteering at the Museum of Science.

Intern #1's reasons for participating in the internship reflect his desire to increase his capacity as a science communicator. He said he wanted to participate in the internship in order "to learn new techniques for effectively communicating science to a wide audience." He also hoped the internship would allow him to explore careers in science education and network with others. Overall, intern #1 felt that the internship fulfilled his expectations. He said he valued the internship because it gave him a chance to see "alternative career paths outside of industry and academia" and learn about "the behind-the-scenes operation of a science museum." He said he also valued the intern coordinator's "presentation about science communication," learning about how to create science content for the public, and giving "a presentation at the MOS about my research at Harvard." He hopes to take the information that he has learned and "incorporate [the intern coordinator's] advice in my future presentations and to seek more public speaking opportunities." Nevertheless, there were some ways intern #1 felt the program could be improved. He suggested adding "more specific examples of how professionals create exhibits and presentations" as well as "more exercises to develop our communication skills." He also suggested removing the planetarium show from the internship "since I could have done that on my own."

#### Intern #2

Intern #2 was a White female between the ages of 18 and 24 years old who has been involved in graduate/post-graduate level research for two to five years. She said it is important for scientists to learn how to present research to others because "at a scientific level... it improves the quality of research... [and] at a public level... I think it is important that everyone has a good understanding of basic scientific concepts." Intern #2 has had a lot of experience with science education/communication programs in the past including "programs that involve being a volunteer for K-12 schools," volunteering for a "science club for girls," and mentoring "undergraduate students in my lab."

Intern #2 wanted to participate in the internship “to learn more effective ways to communicate science and the details involved with creating an exhibit.” She appreciated the internship because it gave her a chance to think about how to effectively communicate science while exploring careers outside of the research domain. She said that through the internship she “learned a lot about how to try and make scientific concepts both accessible and exciting for a general audience” including using “new tools (such as Inkscape!) that I will definitely try out in the future.” However, she also appreciated the internship because she “learned a lot about different careers that utilize a science background and are very different from academic careers.” Despite enjoying the internship overall, intern #2 felt that it would have been helpful if she was provided with “a list of resources (books, videos, etc.) that are relevant to what we discussed during the week.”

### Intern #3

Intern #3 was a White male between the ages of 18 and 24 years old who has been involved in graduate/post-graduate level research for less than one year. He said it is important for scientists to learn how to present research to others because “two components exist for science to be ‘good.’ 1. Effective research w/results. 2. Dissemination of those results, so they can be understood by others, and potentially put to use.” Despite the fact that intern #3 did not say that he has been involved in science education/communication projects in the past, he said that he felt “very comfortable” presenting research to public audiences, and that he’ll “be presenting an exhibit at the Harvard Museum of Natural History” in the future.

Intern #3’s reasons for participating in the internship generally related to his exhibit project for the Harvard Museum of Natural History. He said his goal for the internship was to learn “how to build effective exhibits.” He also said he attended to learn more about science museums and how to get involved at the Museum of Science. Intern #3 reported that through the internship he learned the skills he needed to complete this project such as “movie and speaking skills[,] how to set-up an exhibit or demonstration in a museum[, and] how a museum seeks to informally educate.” However, he thought it would have also been helpful to “look at examples of successful exhibits.” Intern #3 also said he “found taking another look at how I present data was very helpful. [The intern coordinator’s] advice on presentations and talks was particularly enlightening, how he showed the evolution of a bad graph to a beautiful figure,” and that he would now like to get more involved at the Museum “...and put demonstrations of mechanics together.”

### Intern #4

Intern #4 was a White male between the ages of 25 and 34 years old who has been involved in graduate/post-graduate level research for two to five years. He said it is important for scientists to learn how to present research to others “because otherwise scientists may get too caught up in their own world. Scientists need reminding of who benefits for their work. Also, the public needs to see the human side of research - not just the end results and products.” Intern #4 said he has been involved in science education by tutoring “...undergraduate students and an adult continuing ed student,” and that he felt “moderately comfortable” presenting research to public audiences.

Intern #4’s reasons for participating in the internship had to do with being able to communicate science to the public. He said he attended the internship to learn about informal science education and consider a career in science education, and that he would “...like to learn what the most interesting and understandable aspects of my research are to a general audience.” Intern #4 said the thing he valued most about the internship was “being inspired to reach out to the public about science,” and that he hopes “...to connect more of what I do in lab to things anyone (not just scientists) can

understand and value.” Intern #4 also said he appreciated learning about how to communicate his research to other scientists even though “I thought I'd learn most about communicating to those with little scientific backgrounds.” Though intern #4 generally found the internship engaging, he found the science audio segment of the internship only somewhat engaging. In addition, he said, “I think lot of other graduate students I know would be interested in this program if they know about it. So, perhaps, it can be published more.”

### **Discussion**

The university intern coordinator partner and interns all had a deep appreciation of science communication. They felt it was important to not just know how to communicate research to other scientists but also to the public. This was one of the main reasons that the university intern coordinator said she encouraged participation in the internship as well as one of the reasons the interns said they wanted to participate in the internship. In general, the interns felt that the internship did help them improve their science communication and that they were given skills (such as how to create a readable graph) and tools (such as Inkscape) that will help them to better communicate their research. The university intern coordinator agreed that this internship has provided her with a pool of people who she knows can effectively communicate science content to a wide variety of people.

Still, both the interns and the university intern coordinator felt the science communication aspects of the internship could be improved. The interns wanted more practice using science communication skills during the internship. They also asked for more examples of exemplary science communication, and said they wished they had been given a list of science communication resources that they could reference after the internship. The interns also expressed a desire for the internship to expand its focus from just oral presentations to other communication methods. Specifically, many of the interns mentioned that they hoped to learn more about how to create exhibits and wanted to be told about examples of model exhibits. The concern that the university intern coordinator had about the science communication aspect of the internship was that it does not currently provide a long-term way for the interns to practice their new science communication skills with the public. The interns also expressed a desire to find longer-term ways to communicate their research.

Another reason that many of the interns reported they attended the internship was to explore career opportunities outside of research. This is not an explicit goal of the internship which aims to teach researchers how to communicate their research and become enthusiastic about communicating it to the public. Still, the interns expressed that they valued the opportunity that the internship provided them to explore careers outside of the research field, and seemed to feel that this aspect of the internship should remain a part of the agenda.

### **Conclusion**

The feedback collected from the interns and the university intern coordinator indicate that they found the science communication content important and valuable. Therefore, the museum intern coordinator should continue to emphasize this content during the internship. However, he should consider doing the following:

- Either add content about communicating through methods such as exhibits that do not include oral presentations or make sure that interns understand before they attend that this is not a focus of the internship;
- Provide the interns with more examples of exemplary science communication especially through non-oral methods;

- Give interns resources and information that they can refer to after the completion of the internship; and
- Think about how relationships can be made with interested interns so that they can continue to do presentations or provide help to the Museum long after their internships.

The feedback collected from the interns also indicate that an important aspect of the internship was the opportunity to explore career options outside of science research. Therefore, the museum intern coordinator should think about expanding this content after considering whether this is a desirable outcome for the internship and would be acceptable to the university intern coordinator. If this is not a goal of the internship or if the university intern coordinator does not want this content emphasized during the internship, then the museum intern coordinator should consider ways of clarifying the expectations of the program with potential participants.

### **Appendix A: Internship Agenda**

#### Public Communication Internship Draft Plan Version 3.0

Below is a detailed agenda for the internship, held here in a four day format. Lunch occurs every day from 12:00 to 1:00, and has been omitted from the daily agendas. A fifth day can easily be added, this day is an excellent opportunity to allow interns to bring their communication projects.

#### *Day One*

9:00 – 10:00 – Intro and Welcome. Interns meet in the lobby, receive badges and complete some museum paperwork.

10:00 – 12:00 – Museum Tour– Together with their facilitator, interns tour the museum, taking special note of live public programming, and talking about the way in which museums choose their content area.

1:00 – 2:00 – Elevator Speeches– This activity has the interns standing before their peers, and giving one another a 90 second speech about their research work. These speeches are videotaped for later debrief. After each session, facilitator and interns discuss methods for making the elevator speech more effective. Interns are asked to practice speeches during subsequent tour.

2:00 – 3:00 – Backstage Tour– Interns and facilitator tour offices and production spaces in the museum, and practice their elevator speeches with the people they meet.

3:00 – 4:30 – Cocktail Napkins – In this exercise, interns are asked to describe their work in pictures of graphs, using only a pen and a cocktail napkin. This serves as an introduction to Visual Media generally. At the end of this exercise, we outline the requirements for the interns' communication project, and establish a timeline for its completion. Facilitator should keep and scan discarded napkins for future use in training or other purposes.

#### *Day Two*

10:00 – 12:00 – Film and Video – We spend the morning viewing and discussing examples of mass communication about science, including work by Carl Sagan, Jacques Cousteau, James Burke, Bill Nye, and Al Gore. These examples serve as a launchpad for discussion about *why* public audience care (or don't care) about science. (The list clips used are available in the "Film Clips" Folder).

1:00 – 2:00 – Audio – In the afternoon, we listen to some examples of audio programming about science, including NPR and the BBC. Interns will be recorded in the Museum's podcasting studio, and may appear in an episode of the museum's podcast.

2:00 – 4:00 Video Production – After brief introductions to the use of the equipment, and some simple and practical tips, students will be released produce a short subject video about a topic of their choosing. This piece should include at least five cuts, at least one

example of Foley art, one soundtrack element, one title, and one still image. (see Video Tutorial Outline, Appendix).

### *Day Three*

9:30 – 10:30 – Television Broadcast - Interns watch the live broadcast of a “Sci-Tech Today” segment from the floor of the museum.

10:30 – 12:00 – Why Communicate? - On the morning of day three, we discuss the readings from the previous evening, which include selections from Plato, Richard Feynman, and Thomas Kuhn. This activity is intended to serve as a brief introduction the academic study of the history and philosophy of science, as well as a primer on the literature about science communication. (See reading list in Appendix.)

1:00 – 2:30 – Audio/Video completion – Interns use the afternoon of Day Three to complete the editing and output of their podcast appearance and/or short video subject.

2:30 – 4:00 - Project Finalization – Interns make detailed plans for their own communication project, usually either a film piece or a face-to-face talk. These plans should include a schedule for producing the project, as well as a plan for dissemination.

### *Day Four*

9:30 – 12:00 – Public Speaking – The final day is devoted entirely to face-to-face communication. The morning session is a seminar-style presentation, largely similar to the traveling seminar program. Highlights include use of voice, diction, gesture, use of visuals, story-telling structure.

1:00 – 4:00 – Project Production – In the afternoon, interns begin production of their communication projects, and finalize a plan for its completion and dissemination. These projects often take several weeks to complete so the goal on the final day is largely to generate and maintain enthusiasm about the program. To this end, and since it's a Friday, at the end of the day, we go out for beer.

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### **THIS IS A FORMATIVE EVALUATION REPORT**

Formative evaluation studies like this one often:

- **are conducted quickly**, which may mean
  - small sample sizes
  - expedited analyses
  - brief reports
- **look at an earlier version** of the exhibit/program, which may mean
  - a focus on problems and solutions, rather than successes
  - a change in form or title of the final exhibit/program

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