Reaching Out: Understanding Researcher Interests and Needs in Science Outreach

SCIENCE OUTREACH SURVEY

In 2006, Let's Talk Science conducted a web-based survey of publicly funded Ontario scientific researchers, in order to uncover their perceptions and interests about science outreach and to determine barriers that might exist to their ongoing engagement in outreach activities.

A total of 937 surveys were returned by scientific researchers, including 15 responses to the French version of the survey.

Respondents

- 67% of respondents were male researchers; 81% of them aged 31-60 years old.
- 69% were principal investigators; 71% of them worked for a university, 49% were funded by NSERC and 45% were funded by CIHR.

Result Highlights

- The top two benefits of science outreach are: 1) to increase science literacy (79%) and 2) to raise public awareness of research (73%).
- The least cited benefits were to increase public accountability of scientists (15%) and to recruit students to a specialized area of research (15%).
- 87% of respondents were supportive of outreach as a tool for interesting youth in science; and 69% reported being currently engaged in some form of outreach activity.
- 85% of respondents agreed with the statement '*to develop an interest in science, outreach initiatives should begin when children are young (less than 10 years old)';* however only 24% preferred to work with elementary school aged youth (4-13 years old) while 56% respondents favoured working with high school and university/college students.

The type of outreach activities performed by respondents during the past year favoured reaching older students and adults.

- The top three forms of outreach cited were: **mentoring older students** (44%); **writing/being interviewed by the media** (36%); **giving public lectures** (32%). Only 17% of outreach activities involved doing science activities in the classroom and 8% involved science activities with youth in the community.

Motivation

- 56% of scientists responded that recognition would encourage them to get involved while an additional 37% would become involved if it had a positive impact on career advancement.

Only 13% felt that requiring outreach activities as a condition of research grants motivated their involvement.

- A significant motivator to encourage participation in outreach was recognition of the value of outreach by the research community.
- 89% of respondents cited time to participate in science outreach as the greatest barrier to getting involved. The next most significant barriers were the lack of recognition of the importance of the outreach to their careers (48%) and the fact that respondents had no connections to organized opportunities to volunteer (43%).
- 53% of respondents indicated that they felt their outreach activities had a positive effect on participants and 43% indicated a positive effect of their outreach activities on themselves.

Open-ended responses to the survey provided rich detail for many questions and in particular for those about science careers. From these comments a pattern emerged relating to the factors that influenced subject and career choices; it is evident that, for our respondents, early experiences as a young child played a very important role in developing an interest in science.

Over

Survey results continued

SCIENCE OUTREACH SURVEY

Scientists' Needs

- In response to whether they felt well equipped to do science outreach, respondents were almost evenly split between those that felt they were well equipped (38%) and those who felt they were not (39%).
- Of those, 75% of respondents felt they needed specific training such as developing science learning activities and teaching aids, public speaking to a non-scientific audience, meeting with politicians/policymakers, communicating with teachers and interacting with the media.
- 9 out of 10 respondents also felt that they needed support in the following areas in order to get involved with outreach: organization of logistics (e.g. time, location, audience, format of activity etc.), links to groups already doing science outreach, and training.
- According to respondents, this support could be provided by agencies other than the employer. Almost 90% of scientists surveyed would be willing to work with a partner organization to do outreach.
- 56% of scientists indicated that they would like their employer to acknowledge their outreach as a positive contribution; and 44% of scientists feel their employer should relieve them from their work responsibilities to conduct outreach activities.

When asked about the influences that affected their own decision to pursue a research career:

- 74% of respondents cited an "innate interest in science" as a major influence, 29% cited a role model in the field, 38% cited personal experiences, 34% cited courses/teachers in high school and 49% cited courses/professors in university or college.

Methodology

- Let's Talk Science sought to survey publicly funded Ontario scientific researchers directly to understand their interests and needs when it comes to volunteering in science outreach.
- A questionnaire was developed based, in part, on a similar survey conducted by The Royal Society in the UK (*Factors Affecting Science Communication*, 2005). No other similar public research done in Canada was found. The Let's Talk Science survey instrument was reviewed by three external evaluation experts and pilot tested.
- The questionnaire, available in both English and French, was web-based with the survey link disseminated via email directly to Ontario researchers through twenty agencies that fund scientific research in Ontario, Canada.
- Researchers completed the survey during the period November 10 to December 8, 2007.
- The set of 45 questions included closed questions that offered several choices along with space to allow additional open-ended comments.
- The raw data was summarized and then cross tabulated by age, gender and prior volunteer experience.
- The open-ended comments were printed and summarized by topic by staff members. Results from each cross tabulation were compared with the original summarized data and patterns were noted.

The term 'science outreach' is used broadly in this report to include public communication/engagement activities with children, youth, educators, media, politicians, general public etc.

The term 'science literacy' encompasses a basic understanding about science concepts, processes and the nature of science; a basic understanding about the relationship between science, technology, environment and society; and a general appreciation of, and interest in, science.

DISCUSSION

Science Outreach Survey (continued)

- There is overwhelming support by the research community to engage in science outreach activities. This appears to be the result of a significant cultural shift that has occurred over the past decade in the research community away from an isolated 'ivory tower' approach to a more inclusive, public approach to communication.

- Similar results with respect to the level of engagement, the preferred types of engagement activities, the concern about peer perception and lack of recognition were found in a 2005 study of researchers conducted by the Royal Society in the UK. Differences were seen in the higher level of involvement of UK researchers in schools (30% vs. 17% in Ontario). Interestingly, the barrier of 'time' was cited by far fewer UK researchers (29% compared to 89% in Ontario).

- Engaging researchers in science outreach activities may offer an important component of a broader strategy to improve science literacy. Offering the opportunity for the public to interact directly with researchers may address concerns that have been reported by previous surveys. For example the EKOS survey, *Rethinking Science and Society* (2004), found that while the majority of respondents had positive attitudes towards science and research, some questions demonstrated an underlying lack of understanding of the scientific process and the impact of science. For example, in that survey only 42% believed that '*genetically modified food is safe to eat*'. Furthermore, 42% agreed with the statement that *'scientific theories seem to change so often that I don't know what to believe any more'*. The same survey found that there is a high level of public trust in researchers when they talk about issues related to science in Canada.

- Engaging researchers in outreach to youth may inspire youth to pursue studies in science. Attitudes tend to be well entrenched by the time youth reach their teenage years and many young people have a very narrow understanding of science, engineering and technology. Numerous research studies have shown that exposure to a positive role model who connects topics of school study to 'real life' can positively affect attitudes, decisions and actions that are related to course and career selection.

- Engagement of researchers in schools is also an opportunity to provide teachers with resources, materials and access to research facilities to support their teaching efforts.

- It is widely argued that improving science literacy is important for four primary reasons.
    - It is believed that an increase in science literacy and in the number of scientifically trained workers will reap economic benefits as Canada becomes more competitive in a knowledge-based economy.
    - Every day the public is called upon to make judgements based on science information presented in the media. An understanding of scientific processes and risk assessment is important for informed decision making.
    - In a democracy, an informed citizenry and their political leaders are required to ensure the development of public policy that is based on good science.
    - It is also believed that improved science literacy will lead to greater support for scientific research because better informed people are generally more supportive of, although potentially more discriminating about, science and technology.

- There is a critical need to train and support researchers in their outreach efforts. It is unrealistic to expect that their scientific training adequately prepares them to communicate science and engage non-researcher audiences in a meaningful way. It is also unrealistic to require all researchers to be engaged in outreach activities. Researchers should not be penalized for a lack of public communication activities. However, those researchers who do become involved must be recognized. For example, the activity of university-based researchers could be acknowledged as part of their service to the university.

- A tremendous opportunity exists to engage researchers in outreach opportunities that are designed to share science with youth, teachers, political decision-makers, media and the general public. To ensure the greatest impact, it will be very important to strategically consider how this opportunity for engagement fits within the scope of existing demands on their time, the rewards for volunteering in science outreach and the broader social goals of improving science literacy.

- Although respondents identified that positive early experiences and an expressed 'innate interest in science that was encouraged' were major influencers for them in pursuing science education, most also expressed that they are least prepared to work with young children and students in elementary schools. Given the statements made by the respondents about the importance of early experiences and the fact that 85% of respondents also agreed that to develop and interest in science, outreach initiatives should begin when children are less than ten years of age, there is a discrepancy between their personal experiences and beliefs and the science outreach activities that they are prepared to undertake.

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RECOMMENDATIONS

Science Outreach Survey (continued)

Based on the findings of this survey, Let's Talk Science offers the following recommendations to encourage and engage researchers in science outreach.

For funders:

- Do not make science outreach a mandatory requirement of research grants. Not all scientists should be involved in outreach but those who are, and doing it well, must be recognized for their contribution.
- Separate funding for outreach from research grants.
- Provide sufficient funding to allow agencies to co-ordinate and evaluate science outreach efforts and their impact on volunteers, youth and the public.
- Develop a shared vision for science outreach with clearly articulated goals and evaluation metrics to inspire researchers and align their efforts. If it's important—it's worth assessing and evaluating!
- Prioritize efforts and assess the value of engaging researchers in outreach activities. To do this we need to conduct research in the following areas:
    - understanding the relationship between research and science outreach. Does one help the other? How?
    - understanding the impact on targeted audiences of engaging with researchers
    - understanding the impact on researchers of participating in outreach activities.

For the research community:

- High profile researchers and senior agency leaders should publicly recognize the importance of science outreach for the future of scientific research.
- Make the most of the researchers' limited time by connecting with organizations that can provide appropriate training, logistical support and follow-up. This would allow for the greatest impact from everyone's efforts.
- Motivate researchers to participate in science outreach by including their activities in job performance measures e.g. by universities during promotion and tenure decisions.

Let's Talk Science prepared this summary of Reaching Out:

Understanding Researcher Interests and Needs in Science Outreach for public dissemination. The full report, analysis of responses to the 45 questions and the raw data can be purchased from Let's Talk Science.

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Let's Talk Science is a Canadian national charitable organization dedicated to improving science literacy through leadership, innovative educational programs, research and advocacy.