NISE network
NANOSCALE INFORMAL SCIENCE EDUCATION

NISE Network Forum: "Privacy. Civil Liberties. Nanotechnology."

Formative Evaluation

By Elizabeth Kunz Kollmann & Juli Goss

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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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Research and Evaluation Department
Museum of Science
Science Park
Boston, MA 02114
researcheval at mos dot org
617.589.0302

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Executive Summary

This study was conducted as part of the formative evaluation of the NISE Network forum "Privacy. Civil Liberties. Nanotechnology." The purpose of the forum was to bring members of the public together to discuss whether nanotechnology applications that could impact privacy should be used. During the course of the forum, participants learned about nanotechnology from expert speakers, learned about the societal and ethical implications of nanotechnology through the play "Let Alone," had a chance to ask questions of the experts, participated in a small group discussion where they talked about the pros and cons of using nanotechnology applications that may impact privacy, and reported out to the larger group about their discussions.

During 2008 and 2009, this forum was conducted and formatively evaluated three times by the NISE Net Forum Team which is made up of professionals from museums including the Exploratorium (Explo), Museum of Science (MOS), Museum of Life and Science (MLS), Science Museum of Minnesota (SMM), and Oregon Museum of Science and Industry (OMSI). As part of the presentation of the forum, formative evaluation information was collected through various sources including registration surveys, pre/post exit surveys, observations, evaluator discussion debriefs, educator debriefs, and speaker follow-up emails. This information along with data collected through other sources was used to help the team modify and optimize the forum for participants and future program educators. It was also felt that the data collected could be used to help future forum educators and expert presenters understand the needs of potential forum audiences and gain advice from past forum educators. It is for this second reason that the data is presented in this report.

Based on the results of the formative evaluation, advice to those presenting future "Privacy. Civil Liberties. Nanotechnology." forums includes the following:

- When marketing the forum, consider targeting people:
  - Who are already familiar with your institution and its programming, by marketing through internal email lists and member magazines;
  - Who are personally or professionally interested in the programming, by marketing through related organizations; and
  - Who are not as familiar with your institution, by partnering with diverse community organizations who may be interested in the forum topic.
- When choosing a venue, make sure that participants can easily:
  - See and hear the presentations, play, and other participants and
  - Travel to and maneuver in the space.
- When setting the agenda and content for the program, make sure to:
  - Balance the time allowed for expert presentations and small group discussion because participants find both of these segments important;
  - Clearly frame the purpose of the forum and instructions for the small group discussion and report-out;
  - Cover the full range of content relevant to the discussion scenario and play during the expert presentation, including information about nanoscale science, engineering, and technology, applications mentioned in the scenarios and play, and some of their potential societal and ethical impacts; and
  - Prepare the speaker for the forum by telling them who you expect to attend, working with them to craft their presentation, and giving them forum background materials such as the scenarios, agenda, and play ahead of time.

I. Introduction

About the Forum

The "Privacy. Civil Liberties. Nanotechnology." forum was created in 2008 by the NISE Network Forum Team. The museum professionals who comprise the NISE Net Forum Team are staff members from the following institutions:

- Exploratorium (Explo),
- Museum of Life and Science (MLS),
- Museum of Science (MOS),
- Science Museum of Minnesota (SMM), and
- Oregon Museum of Science and Industry (OMSI).

The purpose of the forum was to generate discussion among members of the public about the impacts of nanotechnology on issues of privacy. These forums generally lasted two hours. During this time, participants learned about nanotechnology from an expert speaker, were presented the play "Let Alone"[1] in order to learn about the potential societal and ethical implications of nanotechnology related to privacy, were able to ask the experts questions, discussed in small groups the pros and cons of using different nanotechnologies that could impact our privacy, and reported out to the larger group about their discussions. The educational and programmatic goals for all NISE Net forums including "Privacy. Civil Liberties. Nanotechnology." are the following:

Overarching Goal: *To provide experiences where adults and teenagers from a broad range of backgrounds can engage in discussion, dialogue, and deliberation by:*

- *Enhancing the participants' understanding of nanoscale science, technology and engineering and its potential impact on the participants' lives, society, and the environment.*
- *Strengthening the public's and scientists' acceptance of, and familiarity with, diverse points of view related to nanoscale science, technology, and engineering.*
- *Engaging participants in discussions and dialogues where they consider the positive and negative impacts of existing or potential nanotechnologies.*
- *Increasing the participants' confidence in participating in public discourse about nanotechnologies and/or the value they find in engaging in such activities.*
- *Attracting and engaging adult audiences in in-depth learning experiences.*
- *Increasing informal science educators' knowledge, skill, and interest in developing and conducting programs that engage the public in discussion, dialogue, and deliberation about societal and environmental issues raised by nanotechnology and other new and emerging technologies. (NISE Network, 2007)*

The materials needed to conduct this forum can be found at http://www.nisenet.org/. In addition, further information about other NISE Net forums can be found at nisenet.org, in the *NISE Network Public Forums Manual* (NISE Network, 2007), and in the article "Fostering civic dialogue: A new role for science museums?" (Reich, Bell, Kollmann, & Chin, 2007).

[1] "Let Alone" was written by Kimberly Burke for the Science Museum of Minnesota and the NISE Network. The play can be found on nisenet.org.

About the Evaluation

As part of the creation of the "Privacy. Civil Liberties. Nanotechnology." forum, the program was presented and formatively evaluated three times between September 2008 and September 2009 (see Table A1 in Appendix A). Evaluators from the NISE Net Evaluation Team (Museum of Science, Science Museum of Minnesota, and Oregon Museum of Science and Industry) conducted the evaluation of the program under the direction of the Research and Evaluation Department at the Museum of Science. The purpose of the formative evaluation was to collect data from participants and forum educators in order to understand what changes should be made to optimize the forum experience. Based on these findings, changes have been made which are reflected in the "Privacy. Civil Liberties. Nanotechnology." materials available at http://www.nisenet.org. Those changes included the following:

- Some scenarios were added and changed:
    - One of the scenarios was modified so that nano-dust was no longer described as a means through which to monitor alcohol use by underage drinkers at a high school but rather as a means through which to monitor the diet of holders of health insurance policies.
    - A scenario was added that allowed participants to discuss loss of privacy through online document sharing tools.
- The forum materials (scenarios and play) were translated into Spanish so that they can be used to present to a Spanish speaking or English-Spanish bilingual audience.
- The play, "Let Alone," was modified slightly to make the circumstances of the play more relatable to a broader audience.

The following report contains copies of the formative evaluation memos created about the programmatic runs of "Privacy. Civil Liberties. Nanotechnology." Though the analysis was conducted to help the NISE Net Forum Team make informed decisions about changes to the program, it is hoped that these memos will also aid people who have never presented this forum to host similar events at their institutions. In order to do this, this report contains a description of forum participants' experiences including why participants were likely to attend the forum, what reactions participants had to the event, and what participants were likely to value and learn through their participation. This report also contains the experiences of the educators who presented the forums and advice collected from the NISE Net Forum Team about how to run "Privacy. Civil Liberties. Nanotechnology." The findings presented are also potentially useful to forum speakers as nanotechnology topics that are likely to interest participants as well as the level of information the participants need are included.

Based on the results of the formative evaluation, advice to those presenting future "Privacy. Civil Liberties. Nanotechnology." forums includes the following:

- When marketing the forum, consider targeting people:
    - Who are already familiar with your institution and its programming, by marketing through internal email lists and member magazines;
    - Who are personally or professionally interested in the programming, by marketing through related organizations; and
    - Who are not as familiar with your institution, by partnering with diverse community organizations who may be interested in the forum topic.
- When choosing a venue, make sure that participants can easily:
    - See and hear the presentations, play, and other participants and

    - Travel to and maneuver in the space.

- When setting the agenda and content for the program, make sure to:
    - Balance the time allowed for expert presentations and small group discussion because participants find both of these segments important;
    - Clearly frame the purpose of the forum and instructions for the small group discussion and report-out;
    - Cover the full range of content relevant to the discussion scenario and play during the expert presentation, including information about nanoscale science, engineering, and technology, applications mentioned in the scenarios and play, and some of their potential societal and ethical impacts; and
    - Prepare the speaker for the forum by telling them who you expect to attend, working with them to craft their presentation, and giving them forum background materials such as the scenarios, agenda, and play ahead of time.

These findings and recommendations are based on the formative evaluation of the "Privacy. Civil Liberties. Nanotechnology." forum as conducted by the NISE Net Forum Team at the locations reported in Appendix A (Table A1). Readers should keep in mind that these findings may not be applicable to all institutions that choose to host this forum. These forums were marketed predominantly to people who were museum members, on a museum email list, and/or museum professionals so it is possible that program presenters reaching out to other audiences may experience different results.

II. Methods

Data were collected in 2008 and 2009 during the "Privacy. Civil Liberties. Nanotechnology." forums conducted by the NISE Net Forum Team. The purpose of the formative evaluation was to generate data that could be used to make informed changes to the forums and provide advice to future forum presenters. Multiple methods of data collection were employed including educator debriefs, pre/post exit surveys, observations, registration surveys, evaluator discussion debriefs, and speaker follow-up emails. By using multiple data collection methods, the evaluators were able to develop a more complete picture of the forum experience for visitors and educators (Table 1). Data collection instruments which other museums can use to conduct their own forum formative evaluations can be found in the *NISE Network Public Forums Manual* (NISE Network, 2007).

Table 1. Methodology matrix.

Evaluation Questions	Data Collection Instruments					
	Registration survey	Pre/post exit survey	Observations	Evaluator discussion debrief	Educator debriefs	Speaker follow-up emails
What marketing methods are effective, and not so effective, at attracting audiences to the NISE Net forum events?	X	X			X	
What aspects of the program are valued by the key stakeholders?		X	X	X	X	X
What aspects of the program appear to contribute to the program's ability to achieve its stated goals?		X	X	X	X	
What changes should be made to the program so that it becomes cheaper and easier for other museums to implement?			X		X	X
How can the programmatic model be refined so that it better meets its goals and objectives and better meets the needs of program stakeholders?	X	X	X	X	X	X

Selection of Study Forums

During 2008, the NISE Net Forum Team committed to presenting "Privacy. Civil Liberties. Nanotechnology." as a part of the national forum workshop conducted during the Association of Science-Technology Centers (ASTC) Conference. In order to prepare for this event, the Science Museum of Minnesota ran the "Privacy. Civil Liberties. Nanotechnology." forum once so that the NISE Net Forum Team could make decisions about modifications that needed to be made to the program before the ASTC workshop. The forum was then run and formatively evaluated during the ASTC workshop. It was run a final time by the Museum of Science a year later as part of an effort to translate and evaluate English-Spanish bilingual forum materials. This report contains the data collected from these three forums. These forums were chosen for inclusion in the report because they retained the original forum purpose of giving participants a chance to discuss whether nanotechnology applications that may impact privacy should be used by members of

the public. The forum times and locations from which data were collected can be found in Appendix A (Table A1).

Data Collection Methods

Forms of data collection used for "Privacy. Civil Liberties. Nanotechnology." included registration surveys, pre/post exit surveys, observations, evaluator discussion debriefs, educator debriefs, and speaker follow-up emails. The forums at which each data collection method was used can be found in Appendix A (Table A2).

Registration survey: The registration survey primarily served as a registration tool for the NISE Net Forum Team so that educators at each of the institutional sites knew who was coming to the forum. This survey was also used by the Evaluation Team to understand the participants' relationship to the topic, how they learned about the forum, and if they had a disability. The registration surveys were collected as a part of all three evaluated forums. In total, between 39 and 41 surveys[2] were collected from 62 participants (63 – 66% return rate). This return rate is a result of the nature of the online registration system in that people are allowed to register more than just themselves. Additionally, another reason for the lower rate of return is that the forums allowed for drop-in participants who had not previously registered.

Pre/post exit survey: This method focused on capturing information about who attended the forum, what they learned from the forum, and what they perceived to be the most valuable aspects of the experience. Exit surveys were collected at all three of the evaluated forums. In total, 63 surveys were collected from approximately 64 participants (98% return rate). Participants were given the survey at the beginning of the forum. The first side of the survey contained questions that participants were expected to answer before the forum, and the back side of the survey contained post-forum questions. Survey questions addressed participants' interests and backgrounds, recommendations for improving the program, what they learned and valued about the experience, and the clarity of the information presented during the forum.

Observations: Observational data provided insights on the topics the participants were most interested in discussing during the event. These notes were collected at all three of the forums. Data recorded included content discussed by the speakers during their presentations, questions asked by the participants during the forum, what participants talked about during their small group discussion, and what the groups said were the major summary points from their small group discussion during the report-out.

Evaluator discussion debrief: During all three forums, evaluators observed one to two small group discussions. After observing a small group discussion, evaluators completed a debrief form that summarized the content discussed by the participants. Additionally, evaluators recorded how the small group used the discussion scenarios and whether the small group incorporated the expert presentations into their discussion.

Educator debrief: In the days following the forum, program staff were asked to gather together to discuss their forum experience. Debriefs were conducted following all three forums. Staff members were asked to talk about their thoughts on the success of the forum, how they felt

[2] For the MOS 5.1 forum, evaluators knew how many people attended the program (six) and that at least four of them registered ahead of time. However, evaluators are not sure if all six participants registered.

about their preparation for the event, their thoughts on the structure and format of the forum, and what changes they would recommend for future implementations of the program.

Speaker follow-up email: Within a week following the forum, speakers were contacted and asked to fill out an email survey. A reminder email was sent out a week after the first email. Follow-up emails were collected from the speakers at all three of the evaluated forums. The survey asked the speakers what value they found in participating, how the museum helped him or her prepare, and how the museum could have better helped him or her prepare for the forum.

Data Analysis

By collecting data in a variety of ways, the evaluator was able to triangulate the data. The logic behind triangulation is that "no single method ever adequately solves the problem of rival causal factors" (Patton, 2002, p.247). Therefore, if data is collected through many sources, evaluators can avoid the problems of a one-method study, which is "vulnerable to errors linked to that particular method (e.g., loaded interview questions, biased or untrue responses)" (Patton, 2002, p.248). Studies that utilize multiple methods allow "cross-data validity tests" (Patton, 2002, p.248), and thus reduce the likelihood that the evaluator will draw a false conclusion based on the limits of any one instrument. In this case, data from registration surveys, pre/post exit surveys, observations, evaluator discussion debriefs, educator debriefs, and speaker follow-up emails were compared whenever possible to ensure that findings are not susceptible to error, and to allow for an exploration of differences among data.

Data collected through the instruments were both qualitative and quantitative in nature. Quantitative data were analyzed through descriptive statistics such as percentages, counts, and means. Qualitative data were analyzed using inductive coding. Inductive coding analysis involves "immersion in the details and specifics of data to discover important patterns, themes, and interrelationships" and allowing the coding scheme to emerge from the data (Patton, 2002, p.41).

III. ASTC and SMM Privacy Forum Formative Evaluation Memo

The following summary provides an overview of the findings from the evaluations of the NISE Network forum, "Privacy. Civil Liberties. Nanotechnology.", presented at the Science Museum of Minnesota (identified as SMM 3.4) on September 18, 2008 and at The Franklin Institute (indentified as ASTC 3.1) on October 16, 2008. The presentation of the forum at SMM was considered a test-run for the forum presented at The Franklin Institute which was part of the National Forum Workshop presented at the 2008 ASTC Conference.

The format of the event was similar to many of the other NISE Network forums. Like the other NISE Net forums ("Risks, Benefits, and Who Decides?", "Nanomedicine in Healthcare," and "Energy Challenges, Nanotech Solutions?"), the two-hour event involved one live speaker, a question and answer session with the audience, a small group discussion, and a report-out. Unlike many previous forums, the societal and ethical implications speaker was replaced by a play. The time breakdown of the event, as presented on the agenda, was as follows:

- 5 minutes for a welcome to forum,
- 25 minutes for the speaker presentation,
- 10 minutes for questions and answers,
- 15 minutes for the play "Let Alone,"
- 5 minutes for an introduction to the scenarios and discussion,
- 15 minutes for the discussion of one of the five scenario A's,
- 15 minutes for discussion of scenario B,
- 25 minutes for the report-out, and
- 5 minutes for completing the survey and wrapping up.

The content covered in the forum focused on nanotechnology and its impacts on privacy. The live speakers presented the participants with nanotechnology 101 information as well as some applications of nanotechnology and information about the relationship between nanotechnology and privacy. At the SMM forum, the live speaker was a Ph.D. scientist who works for Twin Cities Public Television. At the ASTC Forum, the speaker was a current museum educator from the Museum of Science. After the live presentations at both forums, the participants were given the chance to ask the live speaker clarifying questions. Then, they viewed a play about privacy called "Let Alone" presented by members of the SMM Science Live Theater. Finally, the participants were presented with two scenarios. For Scenario A, each small group discussion table was given a different scenario. During the SMM forum, the topics of the scenarios included the following:

- Whether participants felt that guardians should be allowed to insert RFID tracking devices in children or adults with dementia,
- Whether participants felt that it was acceptable for companies to track the shopping and spending behaviors of teenagers and adults through RFID bracelets,
- Whether participants thought that it was acceptable for a boarding school to track the alcohol consumption of its under-age students with nano-dust,
- Whether participants felt that people should be allowed to choose cochlear implants that play advertisements in order to reduce the cost of the technology for the patient, and
- Whether participants thought that internet tracking of individuals by the government was acceptable.

These scenarios were altered slightly for the ASTC forum. During that forum, the Scenario A topic about nano-dust was changed so that the participants discussed whether they felt that insurance companies should be able to track the diet of policy holders using nano-dust. After Scenario A, all the groups were given the same Scenario B as the SMM 3.4 forum. This scenario asked the participants to consider whether they felt it was alright for the government to use surveillance methods to look for terrorists, whether the presence of surveillance would change the participants' use of public transportation, whether it is okay to profile a person based on their history, and when the rights of the individual outweigh community security. At the end of the forum, a representative from each table reported out about what their group said during their discussions of Scenario A and B.

1. What marketing methods were effective at attracting attendees to the program?

Registration and Marketing

- The SMM forum was marketed through both internal and external marketing methods.
  - *Internal Museum methods:* http://www.smm.org/forums, SMM email lists, televisions in the SMM lobby, fliers for SMM visitors and staff, and emails to previous attendees who were interested in future forums
  - *External methods:* online sources (SMM Facebook Event), community organizations (emails to Minnesota ACLU and Minnesota Citizen League), and university clubs and organizations (emails to University of Minnesota student groups)
- The ASTC forum was marketed primarily through internal marketing methods.
  - *Internal methods:* emails to ASTC Forum Workshop participant list, emails to the NISE Network partner list, Franklin Institute email blasts, and the Franklin Institute website
  - *External methods:* online sources (Franklin Institute Facebook Event)
- Despite the variety of marketing methods used, the participants reported hearing about the forum through only a few sources (Table 2).
  - At the SMM forum, about half of the registered attendees (12 of 26) heard about the forum through a Museum source and the other half (12 of 26 registered attendees) heard about the forum through their college professor (a local teacher who required students of his nanotechnology class to attend the forum). The specific SMM sources that registered attendees reported hearing about the forum through included an SMM email (7 of 26 registered attendees), the Museum itself (4 of 26 registered attendees), and the SMM website (2 of 26 registered attendees).
  - At the ASTC forum, most of the registered attendees (6 of 9) heard about the forum through work.
- The attrition rate for the SMM forum was low, and attendance numbers were high compared to other forums presented in 2008. However, the attrition rate for the ASTC forum was high and attendance was lower.
  - At the SMM forum, the attrition rate was 34% (29 of 44 registrants attended), and a total of 32 people attended the forum.
  - At the ASTC forum, the attrition rate was 62% (11 of 29 registrants attended), and a total of 24 people attended the forum.

Table 2. Registration survey: Demographic data.

	SMM 3.4 Number of Registrants (N=26)	%	ASTC 3.1 Number of Registrants (N=9)	%
Relationship to forum topic				
Museum member	3	12%	2	22%
Museum volunteer/staff	7	27%	0	0%
Constitution Center member	--	--	1	11%
Constitution Center volunteer/staff	--	--	0	0%
Educator/Teacher	2	8%	1	11%
Personally interested	12	46%	3	33%
Researcher/Student studying nano or a related topic	13	50%	0	0%
Researcher/Student studying science	6	23%	1	11%
Researcher/Student studying energy	--	--	0	0%
Community/Advocacy interest group member	1	4%	0	0%
NISE Network Affiliate	--	--	5	56%
Other	1	4%	1	11%
No Answer	0	0%	0	0%
How heard about the program				
From the museum website	2	8%	2	22%
From the Constitution Center website	--	--	0	0%
From Craigs List	--	--	1	11%
From another website	--	--	0	0%
From a museum email	7	27%	0	0%
From a Constitution Center email	--	--	0	0%
From another email	--	--	0	0%
From a club/organization	--	--	0	0%
Through a friend/family member	2	8%	0	0%
Through my work	--	--	6	67%
Through my college/university	--	--	0	0%
From print media	--	--	0	0%
At the Museum	4	15%	--	--
Other	12	46%	1	11%
No Answer	0	0%	0	0%
Temporary or permanent disabilities				
No Disability	23	88%	6	67%
Mobility	0	0%	0	0%
Cognitive	0	0%	0	0%
Visual	0	0%	0	0%
Auditory	0	0%	0	0%
Learning	1	4%	0	0%
Other	0	0%	0	0%
No Answer	2	8%	3	33%

Participant Demographics

- Unlike most previous NISE Network forums, the people who came to the privacy forums were not general museum goers, and this affected some of the participants' demographics (Tables 2 – 4).

  - At the SMM forum, most of the registered attendees reported that they were either researchers or students studying nano (13 of 26) or staff or volunteers at SMM (7 of 26).
    - Possibly because of this, more males attended the forum than females (SMM 3.4 survey respondents: Male (59%), Female (31%), Unknown (9%)).
    - In addition, the audience was younger than normally seen at NISE Network forums. Almost half of the survey respondents (15 of 32) were between the ages of 18 and 24.
  - At the ASTC forum, almost half of the survey respondents (11 of 23) had never visited the Franklin Institute before.
    - Instead, many survey respondents said a key reason they attended was because they were a member of NISE Net (9 of 23) or a part of the ASTC workshop (9 of 23).
    - This may account for why more females than males attended this forum (ASTC 3.1 survey respondents: Male (17%), Female (78%), Unknown (4%)).
- In all other ways, the forum audiences were similar to the audiences that are normally observed at NISE Network forums (Tables 2 – 4).
  - Most survey respondents were white (SMM 3.4: 22 of 32; ASTC 3.1: 19 of 23).
  - Only one registered attendee (SMM 3.4: learning disability) indicated that they had a temporary or permanent disability.
  - Most of the ASTC 3.1 forum survey respondents (19 of 23) were between the ages of 25 and 54.
  - Many registered attendees indicated that their relationship to the topic was that they were personally interested (SMM 3.4: 12 of 26; ASTC 3.1: 3 of 9).

<u>Conclusion and Recommendations about Marketing</u>

- As with most of the other NISE Network forums, these data show that the marketing methods most likely to attract participants are those that come directly from a known and trusted source such as the museum, a teacher, or the NISE Network. These methods seem to work well because potential participants:
  - Are already familiar with the institution and its programming,
  - Are personally or professionally interested in the programming, or
  - Have a vested interest in attending.
- Because marketing to a college class and colleagues (NISE Net partners and SMM staff/ volunteers) worked so well, the participants' demographics were affected. Some of the effects that were observed included:
  - An audience less familiar with the host institution,
  - More young people, and
  - More people coming because of school or professional interests.
- Still, in some ways the audience was not diverse. Most participants were White and not disabled. To attract a more diverse audience, consider:
  - Partnering with community organizations with memberships that are diverse in these two ways,
    - Using targeted marketing of organizations or communities with higher percentages of people from these two groups, and/or
    - Taking the program outside of the museum.
- One of the SMM educators agreed that partnering with outside organizations would be a good way to attract participants to the forum. She said, "What I'd like to try and recommend to other museums is going directly to a set-up group such as the ACLU or church groups – market directly to them by figuring out who is the head of activities for the different groups. More personalized invites..." (SMM 3.4 debrief)

Table 3. Exit survey: Gender and age data.

	SMM 3.4 Number of Survey Respondents (N=32)	%	ASTC 3.1 Number of Survey Respondents (N=23)	%
Gender				
Male	19	59%	4	17%
Female	10	31%	18	78%
No Answer	3	9%	1	4%
Age				
<18	0	0%	1	4%
18-24	15	47%	1	4%
25-34	1	3%	7	30%
35-44	1	3%	7	30%
45-54	5	16%	5	22%
55-64	3	9%	1	4%
65-74	2	6%	0	0%
75-84	0	0%	0	0%
85+	0	0%	0	0%
No Answer	5	16%	1	4%
Race/Ethnicity (Check all that apply)				
African American	3	9%	2	9%
American Indian/Alaskan Native	0	0%	0	0%
Asian American	6	19%	1	4%
Hispanic/Latino	0	0%	0	0%
White, not of Hispanic origin	22	69%	19	83%
Other	2	6%	0	0%
No Answer	3	9%	1	4%
Last visit to Museum				
Never	--	--	11	48%
Within the last three months	--	--	5	22%
3 - 6 months ago	--	--	0	0%
6 months to 1 year ago	--	--	2	9%
1 - 2 years ago	--	--	1	4%
2 - 5 years ago	--	--	2	9%
5 - 10 years ago	--	--	1	4%
More than 10 years ago	--	--	0	0%
Not sure	--	--	0	0%
No Answer	--	--	1	4%

Table 4. Exit survey: Key reasons decided to attend the forum data.

	SMM 3.4 Number of Survey Respondents (N=32)	%	ASTC 3.1 Number of Survey Respondents (N=23)	%
Key reasons you decided to attend (Check all that apply)				
To meet people, socialize	3	9%	7	30%
Professional networking	0	0%	6	26%
To learn about nanotechnology	22	69%	9	39%
To learn about privacy issues	16	50%	7	30%
To hear others' perspectives	13	41%	10	43%
To share my ideas with others	2	6%	2	9%
To get involved at the Museum	2	6%	2	9%
To learn about NISE	--	--	5	22%
I'm a member of NISE	--	--	9	39%
It's a part of the ASTC workshop	--	--	9	39%
Sounds like fun	8	25%	3	13%
Other	7	22%	4	17%
No Answer	2	6%	1	4%

2. What aspects of the program were valued by the key stakeholders and should therefore be included in future iterations of the forum?

The presentation

- Participants came to the forum because they wanted to learn about the topic (Tables 4 & 5).
  - When asked the key reasons they decided to attend the forum, many survey respondents from both forums responded:
    - To learn about nanotechnology (SMM 3.4: 22 of 32 survey respondents; ASTC 3.1: 9 of 23 survey respondents)
    - To learn about privacy issues (SMM 3.4: 16 of 32 survey respondents; ASTC 3.1: 7 of 23 survey respondents)
  - When asked, on an open-ended question, what they expected from the forum, participants at both forums said they expected to learn (SMM 3.4: 12 of 32 survey respondents; ASTC 3.1: 7 of 23 survey respondents) with the SMM participants adding that they expected this learning to cover science content (SMM 3.4: 4 of 32 survey respondents).
    - An SMM participant said, "I believe this experience will provide me with further information on the topic of nanotechnology." (SMM 3.4 Survey #13)
    - An ASTC participant said, "I expect to learn about the world, nature, my community, and myself." (ASTC 3.1 Survey #20)
- After the forum, some participants reported on an open-ended question that the most valuable aspects of their experiences were the opportunities they had to learn during the event. At the SMM forum, the third highest response survey respondents (3 of 32) gave was that they valued the opportunity to learn. At the ASTC forum, the third highest response survey respondents (4 of 23) gave was that they valued both the experts and the small group discussion (Table 6).

  - An SMM participant said, "[I valued] learning about nanotechnology..." (SMM 3.4 Survey #4)
  - An ASTC participant said, "[I valued] Tim's presentation, [and] talking with small groups." (ASTC 3.1 Survey #18)
- The educators and speakers agreed with participants about the importance of learning and presenting nano-related information through the forum.
  - The ASTC speaker said, "This forum focuses specifically on a topic that I had not spoken about before, preparation for speaking at it allowed me to immerse myself in a body of knowledge with which I was previously unfamiliar." (ASTC 3.1 speaker follow-up)
  - One of the educators said, "Having participated in Boston at the Fred Friendly privacy seminar, I thought that [the speaker] did a really good job of relating privacy to nanotechnology. It felt smooth and easy to follow." (ASTC 3.1 debrief)

<u>The small group discussion</u>

- Unlike many other NISE Network Forums, many participants seemed to expect and look forward to the small group discussion as well as learning (Tables 4 & 5).
  - When asked the key reasons they decided to attend the forum, one of the most common choices was to hear others' perspectives. Among the ASTC survey respondents (10 of 23) this was the most common choice, and among the SMM survey respondents (13 of 32), this was the third most common choice.
  - On an open-ended question, fewer participants said they expected the small group discussion to be part of the forum than said they expected to learn at the forum. However, a few survey respondents said they expected:
    - A discussion (SMM 3.4: 1 of 32; ASTC 3.1: 3 of 23) or
    - A presentation and a discussion (SMM 3.4: 3 of 32; ASTC 3.1: 3 of 23).
    - Some of these participants said:
      - "I expect to review and discuss ethical issues related to the use of nanotechnology..." (SMM 3.4 Survey #5)
      - "[I expect] an interactive discussion on nanotechnology." (ASTC 3.1 Survey #18)
- Although fewer participants expected to participate in a discussion, many participants said they valued this discussion experience after the forum (Table 6).
  - When asked on an open-ended question, the most common responses given by survey respondents who attended the SMM and ASTC forums were that they most valued:
    - The discussion (SMM 3.4: 11 of 32; ASTC 3.1: 8 of 23) and
    - The diverse range of viewpoints (SMM 3.4: 4 of 32; ASTC 3.1: 6 of 23).
  - Some of these participants said:
    - "The discussion in small groups gave me a chance to voice my opinion." (SMM 3.4 Survey #12)
    - "[I most valued] the opportunity to share thoughts and opinions with others and hear others' thoughts." (ASTC 3.1 Survey #3)
- The educators and speakers also found value, for the participants and for themselves, in the small group discussion.
  - The SMM speaker said, "[I valued] meeting a variety of people and hearing their various viewpoints. Being a scientist, it is always interesting for me to hear what people are thinking who do not necessarily have an extensive scientific background. I like learning what has influenced them or shaped their views on science." (SMM 3.4 speaker follow-up survey)
  - One of the SMM educators said, "People got engaged in the conversations. I think the scenarios are open-ended enough [that] you can address a variety of issues." (SMM 3.4 debrief)

- One of the ASTC educators said, "At the table I was at, people seemed really interested in the scenarios and people had a lot to say about them. Our discussion could have gone longer." (ASTC 3.1 debrief)

Table 5. Exit survey: Participant expectations of the forum.

	SMM 3.4 Number of Survey Respondents (N=32)	ASTC 3.1 Number of Survey Respondents (N=23)	Quotes
I will learn.	12	7	"... learn something new" (ASTC 3.1 Survey #22)
No Answer	7	6	--
I have no idea.	3	4	"I was unsure of what to expect, including the format." (ASTC 3.1 Survey #15)
It will have science content.	4	2	"...on the topic of nanotechnology." (SMM 3.4 Survey #13)
It will have a presentation and discussion.	3	3	"I expect to review and discuss…" (SMM 3.4 Survey #5)
It will be fun/interesting.	3	2	"...I think it should be interesting" (ASTC 3.1 Survey #21)
It will have a discussion.	1	3	"I expect an interesting discussion…" (SMM 3.4 Survey #21)
It will have societal impact content.	2	2	"Hopefully, I will learn a bit about... privacy issues…" (ASTC 3.1 Survey #19)
It will be good.	3	1	"As a member of the NISE core partner team (PI+), I hope it's as good as everything I've heard." (ASTC 3.1 Survey #16)
It will have a presentation.	3	0	"Interesting presentation." (SMM 3.4 Survey #4)
I will hear others' opinions.	0	2	"...essentially democratic in that opposing opinions will be drawn out, summarized, and "resolved"" (ASTC 3.1 Survey #7)
It will include interaction.	0	1	"...participatory" (ASTC 3.1 Survey #17)
Hear/learn about different perspectives	1	0	"...Expose students to other views." (SMM 3.4 Survey #7)
It will be intellectually stimulating.	0	1	"Thought provoking…" (ASTC 3.1 Survey #5)
I will meet new people.	0	1	"...meeting new people." (ASTC 3.1 Survey #19)
It will be open-ended.	1	0	"... I expect it to be open…" (SMM 3.4 Survey #8)
I got misinformation.	1	0	"I expect to review and discuss ethical issues related to the use of nanotechnology in health care." (SMM 3.4 Survey #5)

Table 6. Exit survey: Aspects of the forum participants valued most.

	SMM 3.4 Number of Survey Respondents (N=32)	ASTC 3.1 Number of Survey Respondents (N=23)	Quotes
Discussing with others	11	8	"Discussions" (ASTC 3.1 Survey #6)
No answer	9	4	--
Diverse range of viewpoints	4	6	"Hearing others' ideas (things I hadn't considered)" (ASTC 3.1 Survey #5)
The chance to consider their opinions	2	3	"A chance to explore range of opinions on privacy issues." (SMM 3.4 Survey #5)
Opportunity to learn/access to information	3	1	"Learning about nanotechnology…" (SMM 3.4 Survey #4)
The small group discussion and the experts	0	4	"...discussions-very interactive, presenters also very animated." (ASTC 3.1 Survey #14)
Societal/ethical issues discussed	2	1	"Learning about the social impact (privacy) of the science and technology…" (ASTC 3.1 Survey #9)
The play	2	1	"The "play" that showed the conflicting views." (SMM 3.4 Survey #24)
The topic of nanotechnology	2	0	"...future applications of nanotechnology." (SMM 3.4 Survey #22)
Other	2	0	"I valued knowing that this information is being disseminated." (SMM 3.4 Survey #16)
Meeting other participants	1	1	"Meeting new people…" (ASTC 3.1 Survey #8)
The discussion scenarios	0	2	"The different scenarios…" (ASTC 3.1 Survey #14)
The food	0	1	"The cookies?..." (ASTC 3.1 Survey #7)

3. What aspects of the program appeared to contribute to the program's ability to achieve its stated goals and should therefore be included in future iterations of the forum?

The presentations

- Most of the survey respondents agreed that they learned about both nanotechnology and privacy issues through the forums (Tables 7 – 9).
  - Before the forum:
    - Less than half the SMM 3.4 survey respondents (37%) agreed they had a strong understanding of nanotechnology, and half (50%) agreed they had a strong understanding of privacy issues.
    - Over half of the ASTC 3.1 survey respondents (55%) agreed they had a strong understanding of nanotechnology, and just about the same percentage (57%) agreed they had a strong understanding of privacy issues.

  - After the forum:
    - Most of the survey respondents (SMM 3.4: 85%; ASTC 3.1: 96%) agreed that they felt more informed about nanotechnology.
    - Most of the survey respondents (SMM 3.4: 85%; ASTC 3.1: 96%) also agreed they felt more informed about privacy issues.
    - In addition, most of the ASTC survey respondents (96%) agreed that they felt more informed about the risks and benefits of nanotechnology-based tracking devices.
  - On the corresponding open-ended question, surveyed participants most commonly reported learning about topics related to nanotechnology such as nanotechnology applications (SMM 3.4: 8 of 32; ASTC 3.1: 7 of 23) and the science and technology of nano (SMM 3.4: 4 of 32; ASTC 3.1: 4 of 23).
    - One SMM participant said, "I did not know that nanotechnology was already here in everyday life. Example: Pants, lotions etc. That was a surprise to me." (SMM 3.4 Survey #20)
    - One ASTC participant said, "[I learned] more specific information about 'nanotechnology' and application potential." (ASTC 3.1 Survey #14)
- The participants also reported that the presentation and privacy play informed their small group discussions (Table 10).
  - Most of the survey respondents (SMM 3.4: 96%; ASTC 3.1: 100%) agreed that the live speaker informed their discussion.
  - Most of the survey respondents (SMM 3.4: 89%; ASTC 3.1: 96%) agreed that the play informed their small group discussions.
- Some of the educators agreed with the participants that the play informed the small group discussion.
  - One SMM educator said, "I thought it went very well. I think the play itself does a lovely job of hitting and personalizing points the speaker might not hit..." (SMM 3.4 debrief)
  - One ASTC educator said, "I thought the play was great... At my table, I saw people giving examples from their own life. We don't always see this in the other forums—especially energy." (ASTC 3.1 debrief)

Table 7. Exit survey: Participant comfort with nanotechnology before the forum.[3]

	SMM 3.4 Mean Rating (N=30)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"	ASTC 3.1 Mean Rating (N=22)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"
I have a strong understanding of nanotechnology.	2.2	37%	2.5	55%
I feel comfortable expressing my opinions on nanotechnology.[4]	2.4	48%	2.8	77%
I have a strong understanding of privacy issues.[5]	2.5	50%	2.6	57%
I feel comfortable expressing my opinions about privacy issues.	2.7	63%	2.8	77%

[3] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."
[4] SMM 3.4 N=29
[5] ASTC 3.1 N=21

Table 8. Exit survey: Participant ratings of aspects of their forum experience.[6]

	SMM 3.4 Mean Rating (N=27)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"	ASTC 3.1 Mean Rating (N=23)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"
I enjoyed the experience.	3.4	100%	3.6	100%
I had a chance to voice my opinions about the topic.	3.5	96%	3.6	100%
I feel more informed about nanotechnology.[7]	3.0	85%	3.3	96%
I feel more informed about privacy issues.	3.0	85%	3.4	96%
I feel more informed about the risks and benefits of nanotechnology-based tracking devices.[8]	--	--	3.3	96%
I would recommend the forum to others.	3.4	100%	3.6	100%

[6] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."
[7] ASTC 3.1 N=22
[8] ASTC 3.1 N=22

Table 9. Exit survey: Things participants reported learning from the forum.

	SMM 3.4 Number of Participants (N=32)	ASTC 3.1 Number of Participants (N=23)	Quotes
No answer	14	8	--
Uses of nanotechnology	8	7	"That you can feed GPS info into Google Earth" (ASTC 3.1 Survey #16)
About science/technology of nano	4	4	"Definition of nanotechnology…" (SMM 3.4 Survey #4)
What others are thinking	2	2	"My group brought up some new perspectives that I hadn't ever really thought about." (ASTC 3.1 Survey #13)
Lots of information	2	1	"Lots!..." (ASTC 3.1 Survey #19)
Societal aspects of nano	2	1	"More about privacy issues…" (SMM 3.4 Survey #11)
About the risks of nano	0	2	"The true risks involved in utilizing this technology" (ASTC 3.1 Survey #3)
Future directions of nano	1	1	"...Learning about future applications of nanotechnology." (SMM 3.4 Survey #22)
What issues I need to consider about nano	1	1	"The forum helped put a lot of issues into perspective" (ASTC 3.1 Survey #18)
Other	0	1	"Information pertaining to my personal is far more accessible to others than I thought!" (ASTC 3.1 Survey #2)
About the benefits of nano	0	1	"current technologies… benefits" (ASTC 3.1 Survey #15)
Very little	1	0	"Not too much. But I teach a class on these topics, so I didn't expect to. Hope my students did learn." (SMM 3.4 Survey #7)
Nothing	1	0	"Pretty well informed before the forum." (SMM 3.4 Survey #30)
Advancement in science and technology	0	1	"Recent advances" (ASTC 3.1 Survey #5)

The small group discussion

- Survey respondents felt that through the small group discussion they were able to express their opinions about privacy and nanotechnology (Tables 7 & 8).
  - Before the forum, the participants of the two forums varied as to whether they felt comfortable expressing their opinions about its topics.
    - Less than half of the SMM 3.4 survey respondents (48%) agreed that they felt comfortable expressing their opinions about nanotechnology, and over half (63%) agreed that they felt comfortable expressing their opinions about privacy issues.
    - Over three-quarters of the ASTC 3.1 survey respondents agreed that they felt comfortable expressing their opinions about nanotechnology (77%) and privacy issues (77%).
  - After the forum, almost all of the survey respondents (SMM 3.4: 96%; ASTC 3.1: 100%) agreed that they had a chance to voice their opinions during the forum.
- While the participants reported that they had the opportunity to express their own opinions, participants and educators of the two forums did not agree about whether the opinions they heard were diverse (Table 10).

  - At the SMM 3.4 forum, most of the survey respondents (93%) agreed that a diverse range of viewpoints were present at their small group discussion table.
  - At the ASTC 3.1 forum, fewer survey respondents (78%) agreed that a diverse range of viewpoints were present at their small group discussion table.
  - One of the ASTC 3.1 educators felt that the discussion at her table did indicate a diversity of opinions. She said, "For me one of the signs [of success] was that there was a broad variance of opinions at my table. That there were really two parties with vastly different views and that made the discussion interesting." (ASTC 3.1 debrief)
- Most participants also reported that through the small group discussion they were able to discuss the pros and cons of nanotechnology-based tracking devices (Table 10).
  - At the SMM 3.4 forum, all the survey respondents (100%) agreed that they weighed the pros and cons of nanotechnology-based tracking devices.
  - At the ASTC forum, most of the survey respondents (87%) agreed that they weighed the pros and cons of nanotechnology-based tracking devices.

Table 10. Exit survey: Participant ratings of factors relating to the forum discussion.[9]

	SMM 3.4 Mean Rating (N=27)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"	ASTC 3.1 Mean Rating (N=23)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"
The live speaker informed our conversation.[10]	3.2	96%	3.5	100%
The privacy play informed our conversation.	3.1	89%	3.4	96%
The framing of the discussion was unbiased.[11]	3.0	85%	3.0	70%
We weighed the pros and cons of nanotechnology-based tracking devices.	3.3	100%	3.3	87%
A diverse range of viewpoints were represented in our small group discussion.	3.3	93%	3.0	78%

4. What changes should be made to the program so that it becomes cheaper and easier for other museums to implement?

- In general, the SMM 3.4 educators felt that this forum was fairly cheap and easy to implement. One of the educators said, "Set up of the forum is very cheap – just pens and paper. There wasn't a charge for the room at SMM. Most expensive parts are the honorarium for the scientist and the food." (SMM 3.4 debrief)
- However, one educator felt that in order to make it easier for other museums to present the forum that the privacy play should be videotaped for distribution. This educator said, "We could also videotape the play and offer that [in case other museums do not have acting companies]." (ASTC 3.1 debrief)

[9] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."
[10] ASTC 3.1 N=22
[11] SMM 3.4 N=26

- The speakers and educators also felt that other changes should be made to improve the implementation of this forum.
  - The speakers felt that giving them feedback before the forum and providing them with as much background information as possible would make them better speakers.
    - The ASTC 3.1 speaker said, "...If the forums team were inviting a speaker who had not previously spoken at a public forum, it would be ideal to have heard that person speak (in some format or other) and be able to give an effective critique of that person's strengths or weaknesses as a speaker." (ASTC 3.1 speaker follow-up)
    - He also said, "It would be great if we could compile a list of 'commonly asked questions' or 'subjects that often come up in discussion' to help speakers prepare for the types of conversation that commonly crop up during forums." (ASTC 3.1 speaker follow-up)
    - The SMM 3.4 speaker said, "It would be nice to have a sense of who the audience is prior to speaking. For example, there was a group of college students there who were enrolled in a Nanotechnology course. It would have helped to know that ahead of time..." (SMM 3.4 speaker follow-up)
  - The educators emphasized the importance of making sure that the room used for the forum is conducive to conversation.
    - One ASTC 3.1 educator said, "Everyone should be miked-- especially because of the acoustics." (ASTC 3.1 debrief)
    - An SMM 3.4 educator agreed, "[The] room... was a drawback. It is not comfortable to get people at tables facing one direction so they can see the presentation – it is anti-discussion. Chairs are horrid..." (SMM 3.4 debrief)

5. How could the programmatic model be refined so that it better achieves the stated goals and objectives and better meets the needs of the key program stakeholders (including adult learners, museum educators, and nano-researchers)?

<u>The framing of the forum</u>

- The participants felt that some aspects of the forum were well-framed and other aspects were not (Table 11).
  - Participants felt that they had a clear understanding of the forum purpose, but the purpose of the report-out was not as clear to them.
    - Most of the survey respondents (SMM 3.4: 89%; ASTC 3.1: 82%) agreed that the purpose of the forum was clear to them.
    - However, fewer survey respondents (SMM 3.4: 74%; ASTC 3.1: 64%) agreed that the purpose of the report-out was clear to them.
  - Participants felt that the discussion set-up was clear, but a small group of participants felt the framing of the discussion was biased.
    - Most of the survey respondents (SMM 3.4: 96%; ASTC 3.1: 87%) agreed that the ground rules for the discussion were clear.
    - In addition, most survey respondents (SMM 3.4: 96%; ASTC 3.1: 100%) agreed that the small group discussion scenarios were clear.
    - However, a lower percentage of survey respondents (SMM 3.4: 85%; ASTC 3.1: 70%) agreed that the discussion framing was unbiased.
- In addition, a few participants felt that the timing of the event's agenda needed to be changed (Table 12).

  - On an open-ended question, the second most common response that SMM 3.4 survey respondents (4 of 32) gave was that the timing of different forum segments needed to be changed. One ASTC 3.1 survey respondent (of 23) also agreed that the timing should be changed.
  - Some of these survey respondents said:
    - "Either lengthen the nano content presentation so that it's clear what happens or reduce the scope of the items covered to what you can explain..." (SMM 3.4 Survey #2)
    - "...Allow a little more time for other people to comment on the small group discussions." (SMM 3.4 Survey #8)
    - "I would like more time to discuss and more time to hear other peoples (groups) thoughts." (ASTC 3.1 Survey #19)
- Some of the educators agreed that the framing of the forum was not always as concise and regimented as it could be.
  - One ASTC 3.1 educator said, "Don't wait until 7:15 for more people to show up. Just start on time so that people can leave on time." (ASTC 3.1 debrief)
  - Another educator agreed that the timing of the forum was problematic. He said, "...We started late but it seemed the report out got long at the end with each table reading their scenario. To me it seemed to drag on." (ASTC 3.1 debrief)
  - Another ASTC 3.1 educator said, "I think a couple of prompts at the point [in the discussion] where you give people two minutes to read that let people know that they can start the discussion would be good. People didn't know when to start. [And] it felt abrupt at the end when we had to stop to do the report out." (ASTC 3.1 debrief)

Table 11. Exit survey: Participant ratings of the clarity of information provided during the forum.[12]

	SMM 3.4 Mean Rating (N=27)	% of Survey Respondents Choosing "Clear" or "Very Clear"	ASTC 3.1 Mean Rating (N=23)	% of Survey Respondents Choosing "Clear" or "Very Clear"
The purpose of the forum	3.2	89%	3.0	82%
The nanotechnology content[13]	2.9	74%	3.1	86%
The ground rules for discussing with others	3.5	96%	3.3	87%
The small group discussion scenarios	3.4	96%	3.4	100%
The purpose of the report-out[14]	2.9	74%	2.9	64%

[12] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Not at all clear," 2 is "Somewhat clear," 3 is "Clear," and 4 is "Very clear."
[13] ASTC 3.1 N=22
[14] SMM 3.1 N=7

Table 12. Exit survey: Ways that participants say the forum could be improved.

	SMM 3.4 Number of Participants (N=32)	ASTC 3.1 Number of Participants (N=23)	Quotes
No Answer	13	13	--
Change the content/topic	5	2	"less talk about NISE in the intro-not so interesting for the public and delays getting into the meat of things" (ASTC 3.1 Survey #17)
Don't change a thing	5	2	"Forum worked well. I have no suggestions at this time." (SMM 3.4 Survey #6)
Change the amount of time spent on different segments of the program	4	1	"More time in group discussions." (SMM 3.4 Survey #9)
Improve the conditions of the room (lighting, etc.)	4	1	"Have a location that does not echo" (ASTC 3.1 Survey #1)
Improve the audio-visuals	2	0	"More visual representation to the theories." (SMM 3.4 Survey #10)
Change small group discussion scenarios	0	1	"link with nano more explicit" (ASTC 3.1 Survey #21)
Change the moderated discussion	0	1	"Ask people to introduce themselves to each other before beginning small group discussions" (ASTC 3.1 Survey #16)
Invite a broader range of/or different experts	0	1	"Presentations instead of (or in addition to) play for privacy." (ASTC 3.1 Survey #6)
Other	1	0	"Weekend time slot." (SMM 3.4 Survey #5)
Change the format	1	0	"...Try to get activities if possible." (SMM 3.4 Survey #12)
Provide more organizational structure	1	0	"Perhaps state some specific goals when starting the forum…" (SMM 3.4 Survey #8)
Present real world examples	0	1	"make it even more real, e.g. this technology is really available from x for x cost" (ASTC 3.1 Survey #8)

The presentations

- Though the participants found value in the presentation, they felt that some information needed to be added and clarified (Tables 11 & 12).
  - Unlike many previous Grant Year 3 forums ("Energy Challenges, Nanotech Solutions?"), less than 90% of the survey respondents (SMM 3.4: 74%; ASTC 3.1: 86%) agreed that the nanotechnology content was clear.
  - In addition, on an open-ended question, the most common response by the survey respondents (SMM 3.4: 5 of 32; ASTC 3.1: 2 of 23) was that the content or topic of the forum needed to be changed. Most of these survey respondents (5 of 7) thought that more nanotechnology information needed to be added to the presentations.
    - One SMM 3.4 participant said, "...I think more explanation would help, especially on smart dust, how it works, what the military uses it for, etc." (SMM 3.4 Survey #4)

    - Another SMM 3.4 participant said, "You may want to give a more in-depth [description] about nanotechnology and how far we have come so far in society." (SMM 3.4 Survey #11)
    - An ASTC 3.1 participant said, "Link [the forum] to science center's- [it] seemed like most of the audience was related to the museum field." (ASTC 3.1 Survey #18)
- While the educators were generally happy with the speaker presentations, they also felt that they could be improved with added information.
    - One SMM 3.4 educator said, "For speaker – make sure they talk a bit more about each scenario topic." (SMM 3.4 debrief)
    - Another SMM 3.4 educator said, "[We] were talking that if we could afford it, have one more expert at the privacy forum in Philly... People had ideas of where the legalities were and were not. Someone who could take 5 or 10 minutes and put it in a framework [would be helpful]..." (SMM 3.4 debrief)
- The educators and speakers were also concerned about how the speaker's role should change throughout the forum.
    - One ASTC 3.1 educator said, "[The speaker] had a big burden in answering questions. There were a lot of questions that he was asked or could have been asked. I think we need to think hard about when we have one speaker do they have a microphone the whole time during the Q and A or do we create a FAQ?" (ASTC 3.1 debrief)
    - The SMM 3.4 speaker said, "During the discussion portion, it is unclear what the scientist's role is. They are to be available for questions, but in my experience, no one ever asks questions of the scientist and they are left to roam the room..." (SMM 3.4 speaker follow-up)
    - An ASTC 3.1 educator felt that the role of the speaker needs to change during the course of the forum. She said, "...How do we change the speaker role at the end so that they can give their own opinion?" (ASTC 3.1 debrief)

<u>The small group discussion</u>

- The participants were generally happy with the small group discussion, and only two people from the ASTC 3.1 forum asked for improvements to the discussion (Table 12).
    - One ASTC 3.1 participant said, "[Make the] link with nano more explicit." (ASTC 3.1 Survey #21)
    - Another ASTC 3.1 participant said, "Ask people to introduce themselves to each other before beginning small group discussions." (ASTC 3.1 Survey #16)
- Still, observations indicated that there were some problems with the small group discussion.
    - "...Most of the people at the table were science museum professionals, except for one gentleman. This man was sort of the 'odd man out.' He was not opposed to many of the privacy technologies, and his more conservative view seemed not to resonate with the rest of the members of the table. Interestingly, people did not seem to really build upon what it is that he had to say. In addition, during the report out, his minority view, in favor of the use of these technologies, was not represented at all." (ASTC 3.1 discussion debrief)
    - "The group largely talked about the privacy technologies, with very little mention made to nanotechnology. All talked about the scenarios, and linked the scenarios to different situations in their everyday lives, particularly those situations that involved the safety of loved ones..." (ASTC 3.1 discussion debrief)
- In addition, the educators felt that some privacy topics were missing were not addressed in the scenarios so new ones should be added. One ASTC educator said, "...[I'm thinking about] adding a new scenario. There would be an additional scenario in the first round. Possibly about airlines..." (ASTC 3.1 debrief)

Conclusion and Recommendations about the Forum Format and Content

- The participants and educators mentioned some logistical issues that should be taken into account when presenting future privacy forums.
  - The educators and participants recognized the importance of checking any venue that you use to make sure that:
    - Participants can easily see and hear the play and presentations and
    - Many people can easily talk to each other in the space.
  - The educators felt that it may not be easy to disseminate the play. Therefore, the team should consider whether it is best for museums without a theater group to:
    - Have a videotape of the play or
    - Have a script-in-hand reading by the museum educators and/or the participants.
- Participants and educators felt that the framing of the forum and the discussion segments were not always clear. Therefore, the team should consider writing a script/creating bullet points that explain:
  - What the team hopes participants will get out of the forum,
  - What overarching question the small groups should be trying to answer during their discussion,
  - What the instructions for the small group discussion are, and
  - What the purpose of the report-out is.
- Participants, educators, and the speakers felt that some content was missing from the live speaker presentation. Therefore, it is important for the team to work with their presenters to make sure that they:
  - Are given information about who is coming to the forum and what previous forum audiences have been interested in,
  - Are given help with connecting their presentation to the scenarios,
  - Are given bullet points of content, including background information about nanoscale science, engineering, and technology and its applications, that can be added to their presentation, and
  - Are given aid in thinking about how to present their content clearly.
- The small group discussion seemed to elicit lively conversations among the participants. However, the educators and participants suggested changes to the discussion including:
  - Adding more scenarios to cover more privacy issues,
  - Thinking about how to inject more nanotechnology to the discussion, and
  - Lengthening the discussion so that participants have more time to talk.

IV. Museum of Science Privacy Forum Formative Evaluation Memo

The following summary provides an overview of the findings from the formative evaluation of the NISE Network forum, "Whose Information is it Anyway: Privacy in the Digital Age," presented at Spontaneous Celebrations[15] in Jamaica Plain, MA on October 9, 2009 (MOS 5.1). This forum was held off-site by the Museum of Science, Boston.

The format of the event was similar in most ways to previous forums presented by the NISE Net Forum Team ("Risks, Benefits, and Who Decides?", "Nanomedicine in Healthcare," and "Energy Challenges, Nanotech Solutions?"). The two-hour event involved one live speaker, a play by Kimberly Burke entitled "Let Alone" presented in English and Spanish, questions and answers with the speaker, a small group discussion framed by scenarios, and a report-out. The biggest difference between this forum and most other NISE Net forums was that content was provided in both English and Spanish. Surveys, consent forms, presentation notes, and scenario materials were written in both languages and the play was presented twice, first in English and again in Spanish. Additionally, a bilingual translator was present to translate comments during the introduction, question and answer period, and report-out as needed. The time breakdown of the event, as presented on the agenda, was as follows:

- 5 minutes for a welcome and introduction to forum,
- 15 minutes for the live speaker presentations,
- 15 minutes for play presented in English,
- 15 minutes for play presented in Spanish,
- 10 minutes for questions and answers,
- 5 minutes for an introduction to the small group discussion,
- 35 minutes for the small group discussion,
- 15 minutes for the report-out, and
- 5 minutes for wrapping up.

The content covered in the forum focused on how nanotechnology has impacted privacy issues by making it easier to collect and store information. The live speaker, a Museum of Science educator, covered a range of information relating to this topic including nanotechnology 101 information, the scale of nanotechnology, the ways in which nanotechnology is allowing for further data collection of the public, and the potential issues associated with having personal information gathered and stored by different entities. After the speaker, a short play was presented, first in English and again in Spanish. The play centered on a husband and wife and their discussion about nanotechnology-based data collection systems and how these products might impact their privacy. Following a question and answer period with the speaker, participants took part in a small group discussion about how privacy issues might be impacted by nanotechnology. For the first scenario, the two small groups discussed different scenarios: one group discussed whether it was acceptable to implant an RFID chip in an older family member with Alzheimer's disease; and the second group discussed possible implications of data collected through free internet services. For the second scenario, both groups discussed their feelings about loss of privacy due to an increase in subway surveillance after a hypothetical terrorist attack. After the small group discussion, a representative from each table reported out about their scenario discussions.

[15] Spontaneous Celebrations is a community cultural center located in the Jamaica Plain neighborhood of Boston.

1. What marketing methods were effective at attracting attendees to the program?

Registration and Marketing

- The Museum of Science marketed the MOS 5.1 forum through both internal and external marketing methods.
  - Internal marketing methods included: a Museum of Science email, the MOS website, the Museum's adult brochure, and mention of the forum during another Museum of Science event.
  - External methods included: Facebook, Twitter, fliers distributed in Jamaica Plain, and emails to groups at Northeastern and Harvard. The offsite location, Spontaneous Celebrations, also sent information via email to their listserv.
- The marketing methods that were best at attracting participants were internal museum methods (Table 13).[16]
  - Almost two-thirds of the registered individuals (11 of 18) reported that they heard about the forum through the Museum website.
  - The second most common way individuals heard about the event was a Museum email (5 of 18 registrants).
- As with some of the previous nanotechnology forums, the attrition rate was high. Although 18 individuals registered for the MOS 5.1 forum, only 8 people participated, two of whom were Museum of Science employees who had not previously signed up for the event.
- Staff felt that attendance might be improved by creating connections with local, related organizations and marketing through these groups.
  - One educator said, "[It's] really important if [the forum is] off-site to get other organizations involved." (MOS 5.1 debrief)
  - Another educator said, "Heavy promotion [is something the Museum of Science could do differently in the future to improve the forum for a bilingual audience]. Make strong connections to the target communities to help guarantee participants." (MOS 5.1 speaker email)

Participant Demographics

- Despite being marketed as a "bilingual forum," the MOS 5.1 forum did not attract many Spanish speakers (Tables 14 & 15).
  - All the attendees spoke English and for most, it was their preferred language.
    - Most survey respondents (6 of 8) reported that the primary language spoken at their home was English.
    - Only a couple of survey respondents (2 of 8) reported "both English and Spanish" as the primary language spoken at home.
- Few attendees were Hispanic.
  - Almost two-thirds of survey respondents (5 of 8) were White.
  - The remaining attendees (3 of 8 survey respondents) were Hispanic/Latino.
- There were some ways in which the demographics of the MOS 5.1 forum's participants differed from previous Museum of Science forums (Table 14).
  - More participants reported having a temporary or permanent disability than previous forums (MOS 5.1: 3 of 8 survey respondents).
  - The age range of the forum participants was not as large as previous Museum of Science forums (MOS 5.1: Survey respondents were 25-64 years old).

[16] Registration survey results reported here include everyone who registered (18 people) not just those who attended the forum (6 public participants and 2 MOS staff participants).

Conclusion and Recommendations about Marketing

- To attain desired diversity of participants, educators planning future bilingual forums should consider:
  - Creating relationships with Hispanic/Latino community groups to create interest.
  - Involving local Hispanic/Latino community groups in the creation or modification of program materials to increase program buy-in.
  - Encouraging collaborating groups to do more marketing.

Table 13. Registration survey: Demographic data.[17]

	MOS 5.1 Number of Registrants (N=18)	%
Relationship to forum topic		
Museum member	4	22%
Museum volunteer/staff	1	6%
Educator/Teacher	2	11%
Personally interested	11	61%
Researcher/Student studying nano or a related topic	1	6%
Researcher/Student studying science	2	11%
Community/Advocacy interest group member	3	17%
NISE Network Affiliate	0	0%
Other	2	11%
No Answer	0	0%
How heard about the program		
From the museum website	11	61%
From another website	0	0%
From a museum email	5	28%
From another email	0	0%
From a club/organization	0	0%
Through a friend/family member	4	22%
Through my work	1	6%
Through my college/university	0	0%
From print media	1	6%
Other	0	0%
No Answer	1	6%
Temporary or permanent disabilities[18]		
No Disability	15	83%
Mobility	1	6%
Cognitive	0	0%
Visual	0	0%
Auditory	1	6%
Learning	0	0%
Other	1	6%
No Answer	1	6%

[17] The N includes all the people who filled out the registration survey including those who did not actually attend the forum.
[18] Percentages add up to greater than 100% because one participant reported having multiple disabilities.

Table 14. Exit survey: Demographic data.

	MOS 5.1 Number of Participants (N=8)	%
Gender		
Male	3	38%
Female	5	63%
No Answer	0	0%
Age		
<18	0	0%
18-24	0	0%
25-34	3	38%
35-44	1	13%
45-54	3	38%
55-64	1	13%
65-74	0	0%
75-84	0	0%
85+	0	0%
No Answer	0	0%
Race/Ethnicity (Check all that apply)		
African American	0	0%
American Indian/Alaskan Native	0	0%
Asian American	0	0%
Hispanic/Latino	3	38%
White, not of Hispanic origin	5	63%
Other	0	0%
No Answer	0	0%
Last visit to Museum		
Never	0	0%
Within the last three months	4	50%
3 - 6 months ago	1	13%
6 months to 1 year ago	0	0%
1 - 2 years ago	0	0%
2 - 5 years ago	0	0%
5 - 10 years ago	0	0%
More than 10 years ago	0	0%
Not sure	1	13%
No Answer	2	25%
Temporary or Permanent Disabilities		
No Disability	5	63%
Mobility	1	13%
Cognitive	1	13%
Visual	0	0%
Auditory	1	13%
Learning	0	0%
Other	0	0%
No Answer	0	0%

Table 15. Exit survey: Primary language spoken.

	MOS 5.1 Number of Participants (N=8)	%
English	6	75%
Spanish	0	0%
Both English & Spanish	2	25%
No Answer	0	0%

2. What aspects of the program were valued by the key stakeholders and should therefore be included in future iterations of the forum?

The presentation and play

- Before the MOS 5.1 forum, most participants reported that a key reason they decided to attend was to learn. After the forum, participants still highly valued the opportunity to learn about nanotechnology through the forum (Tables 16 & 17).
  - When asked the key reasons they decided to attend the forum, two of the most popular responses from participants were:
    - To learn about privacy issues (5 of 8 survey respondents) and
    - To learn about nanotechnology (3 of 8 survey respondents).
  - On an open-ended question included in the exit survey, one of the things participants were most likely to say they valued about their experience was the opportunity to learn (2 of 8 survey respondents). One respondent said, "[I valued] learning about technology" (MOS 5.1 Survey #6).
- The educators also agreed that the presentation was a valuable part of the MOS 5.1 forum. However, they also felt there was value in the play.
  - One educator said, "I liked [the speaker's] talk... It gave enough nano if [participants] came for that. They got some [nanotechnology background], but more concrete connections are good. Those kinds of applications were strong." (MOS 5.1 debrief)
  - The educator also commented, "What I got most out of the play was the silent times – to think about what the people said. The timing of that and the directing of that was powerful. I liked that it reflected the deliberative nature of the forum." (MOS 5.1 debrief)

Table 16. Exit survey: Key reasons forum participants decided to attend.

	MOS 5.1 Number of Participants (N=8)	%
To meet people, socialize	2	25%
Professional networking	1	13%
To learn about nanotechnology	3	38%
To learn about privacy issues	5	63%
To hear others' perspectives	5	63%
To share my ideas with others	1	13%
To get involved at the Museum	1	13%
Sounds like fun	1	13%
Other	2	25%
No Answer	0	0%

Table 17. Exit survey: Aspects of the forum participants valued most.

	MOS 5.1 Number of Participants (N=8)	MOS 5.1 Quotes
No answer	3	
Opportunity to learn/access to information	2	"learning about technology." (MOS 5.1 Survey #6)
Discussing with others	2	"the discussions of the questions" (MOS 5.1 Survey #5)
Diverse range of viewpoints	1	"Hearing other's opinions - some similar to mine but quite interesting to hear ones not." (MOS 5.1 Survey #7)

The small group discussion

- Before the MOS 5.1 forum, most participants reported that a key reason they decided to attend was to interact with others. After the forum, participants still highly valued the opportunity to socialize and hear others' perspectives during the forum (Tables 16 & 17).
  - When asked the key reasons they decided to attend the forum, one of the most common responses from participants was to hear others' perspectives (5 of 8 survey respondents).
  - On an open-ended question, some of the most common responses were that the participants most valued the discussion with others (2 of 8 survey respondents) and the diversity of viewpoints (1 of 8 survey respondents) present at the forum.
    - One participant said, "[I valued the] the discussions of the questions" (MOS 5.1 Survey #5).
    - Another participant said, "[I valued] hearing the women I met at my table express their thoughts" (MOS 5.1 Survey #1).
- The speaker and educator also found the small group discussion valuable.
  - The speaker said, "For me, it was most valuable just to see how people reacted to this topic. It was interesting to see what aspects of this issue were most interesting to people, and to see how engaging the idea of privacy can be" (MOS 5.1 speaker email).
  - In the event debrief, the educator noted that "people had good discussions and answered each others' questions" (MOS 5.1 debrief).

3. What aspects of the program appeared to contribute to the program's ability to achieve its stated goals and should therefore be included in future iterations of the forum?

The presentation and play

- Most of the survey respondents agreed that they learned about both nanotechnology and privacy through the MOS 5.1 forum (Tables 18 – 20).
  - Before the Forum:
    - One-quarter of the survey respondents (2 of 8) agreed they had a strong understanding of nanotechnology.
    - Less than half of survey respondents (3 of 8) agreed they had a strong understanding of privacy issues.
  - After the Forum:
    - Over three-quarters of the survey respondents (6 of 7) agreed that they felt more informed about nanotechnology.

  - All of the survey respondents (8 of 8) agreed that they felt more informed about the risks and benefits of nanotechnology.
  - All of the survey respondents (8 of 8) also felt more informed about privacy issues.
- On the open-ended question, 4 of 8 survey respondents reported learning about topics related to nanotechnology including its science and technology (1 of 8), associated risks (1 of 8), societal aspects (1 of 8), and future directions (1 of 8). One participant commented, "[I learned] how amazing nanotech can be [and that it has] both negative and positive [aspects]" (MOS 5.1 Survey #7).
- Additionally, observations and surveys indicated that the presentation and play influenced the small group discussions (Table 21).
  - All of the participants agreed that the live speakers (8 of 8 survey respondents) and play (8 of 8 survey respondents) informed their discussion.
  - Both educator and evaluator observations also indicated that the participants incorporated the presentation and play into their discussion.
    - One discussion debrief reported: "Table 4 never directly referenced [the speaker's] presentation, but [they] did bring up examples of technology that he mentioned in his talk such as credit card data, GPS devices in cell phones, and internet search engine tracking. The play was directly mentioned a few times during the common scenario discussion in relation to inequities in screening or tracking certain individuals or populations. Other topics addressed in the play such as government observation of Latinos, terrorists, and perceived criminal populations were also mentioned in the discussion" (MOS 5.1 Evaluator Debrief).
    - An educator said, "The fact people talked about racial profiling was a nod to the play. The play made them consider Latinos" (MOS 5.1 debrief).

Table 18. Exit survey: Participant comfort with nanotechnology before the forum.[19]

	MOS 5.1 Mean Rating (N=8)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"
I have a strong understanding of nanotechnology.	2.1	2
I have a strong understanding of privacy issues.	2.5	3
I feel comfortable expressing my opinions on nanotechnology.	3.0	6
I feel comfortable expressing my opinions on privacy issues.	3.1	7

[19] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."

Table 19. Exit survey: Participant ratings of aspects of their forum experience.[20]

	MOS 5.1 Mean Rating (N=8)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"
I enjoyed the experience.	3.6	7
I voiced my opinions about the topic.	3.6	8
I feel more informed about nanotechnology.[21]	2.8	6
I feel more informed about privacy issues.	3.4	8
I feel more informed about the risks and benefits of nanotechnology.	3.1	8
I felt comfortable expressing my opinions on nanotechnology.	3.4	7
I felt comfortable expressing my opinions on privacy issues.	3.5	7
I would recommend the forum to others.	3.4	7

Table 20. Exit survey: Things participants reported learning from the forum.

	MOS 5.1 Number of Participants (N=8)	MOS 5.1 Quotes
No answer	3	--
About science/technology of nano	1	"some specifics about nanotechnology…" (MOS 5.1 Survey #5)
About the risks of nano	1	"How amazing nano tech can be - both negative and positive" (MOS 5.1 Survey #7)
Other	1	"MOS email or website" (MOS 5.1 Survey #8)
Societal aspects of nano	1	"I need to become more conscious of how scary life has become." (MOS 5.1 Survey #1)
Future directions of nano	1	"future technologies" (MOS 5.1 Survey #6)

Table 21. Exit survey: Participant ratings of factors relating to the forum discussion.[22]

	MOS 5.1 Mean Rating (N=8)	% of Survey Respondents Choosing "Agree" or "Strongly Agree"
The live speaker informed our conversation.	3.5	8
The play informed our conversation.[23]	2.9	7
The discussion worksheets were unbiased.	3.0	8
We weighed the pros and cons of nanotechnology.	3.4	8
A diverse range of viewpoints were represented in our small group discussion.	3.6	8

[20] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."
[21] N=7
[22] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."
[23] N=7

The small group discussion

- MOS 5.1 survey respondents felt that through the small group discussion they were able to express their opinions (Tables 18 & 19).
  - Before the forum, the majority of the participants reported that they felt comfortable expressing their opinions about nanotechnology (6 of 8 survey respondents) and privacy issues (7 of 8 survey respondents).
  - Discussion debriefs reported that while there were some issues with the balance of the discussions, everyone had a chance to voice their opinions. Additionally, participants reported after the forum that they had a chance to voice their opinions.
    - All the survey respondents (8 of 8) agreed that they voiced their opinions during the forum.
    - Observations at one table caused the evaluator to note, "Everyone talked, but one person dominated the discussion throughout. It got a little better as people warmed up and the discussion progressed, but [the individual] still seemed to talk a lot. Two people acted as facilitators making sure everyone talked which was good" (MOS 5.1 discussion debrief).
    - Observations at the other table elicited a different response, "There was a good amount of back – and – forth dialogue among the participants, and no one person seemed to talk on and on without allowing opportunities for others to speak or dominated the conversation" (MOS 5.1 discussion debrief).
- Participants also seemed satisfied with the range of viewpoints and topics represented during the MOS 5.1 forum (Table 21).
  - All of the survey respondents (8 of 8) reported that a diverse range of viewpoints was represented in their small group discussion.
  - Observations of the two small group discussions showed that a variety of topics were expressed, sometimes beyond the scope of the given scenario. The discussion debriefs reported:
    - "The discussion seemed to be a mix of personal stories, conveying news stories or real world examples, reactions to the scenarios provided, and generating ethical concerns and implications around the scenarios" (MOS 5.1 discussion debrief).
    - "They did not stay within the parameters of the discussion...But they had a good discussion" (MOS 5.1 debrief).
    - One educator notes the positive aspects of this variety saying, "It's easy to say they didn't answer the question, but there was a lot of richness in them being able to go where they wanted to go" (MOS 5.1 debrief).

4. What changes should be made to the program so that it becomes cheaper and easier for other museums to implement?

- The educators found the bilingual aspect of the MOS 5.1 forum expensive but noted that this cost will be lessened somewhat for future forum presenters since the materials will only have to be modified and not completely re-translated.
  - One educator said, "The translations were the most expensive. ...The fact that everything has been translated [makes this cheaper for future museums presenting the forum]" (MOS 5.1 debrief).
  - Another educator noted that these translations would only need to be modified because "the Spanish was a little more formal. Certain phrases were dropped out of the Spanish play" (MOS 5.1 debrief).
- The educators and speaker identified several other materials which could also benefit other museums who implement the forum.

- One educator noted, "[It] would be good to add some background information and FAQs. Like that it is a plug and play model" (MOS 5.1 debrief).
- Some staff felt that creating videotapes of both the presentation and play could be helpful to future forum implementers. During the forum debrief, one educator said, "[We] talked about making a video [because it would be] nice not having to train people in every city. You could do it with subtitles so [the actors] don't have to do it twice. ...I think it is important to videotape it, but a strength to have it live" (MOS 5.1 debrief).
- The speaker said, "[It might make sense] to save a complete copy of the talk and give it to the speakers to help them shape their own talks" (MOS 5.1 speaker email). This speaker agrees that his own presentation was aided in this way saying, "[The educator] gave [me] a few examples of things [the previous speaker] had done in his version of this talk...which helped me get a sense of how to shape my presentation" (MOS 5.1 speaker email).

- Both attendees and museum staff brought up the necessity of making sure that an appropriate event space it used. This can be especially problematic when presenting forums off-site in unfamiliar locations.
  - When asked how we could improve the next forum, one survey respondent commented, "[You should] have [the forum] in a more accessible space." (MOS 5.1 Survey #7) (Table 22).
  - One educator noted the same thing saying, "Make sure you have an ADA compliant space. This forum was held on a second floor with no obvious handicap access" (MOS 5.1 speaker email).
  - One educator said, "Going out is great, but if people are there we need to make sure they're comfortable" (MOS 5.1 debrief).

Table 22. Exit survey: Ways that participants say the forum could be improved.

	MOS 5.1 Number of Participants (N=8)	MOS 5.1 Quotes
No Answer	5	--
Change the amount of time spent on different segments of the program	2	"More discussion time" (MOS 5.1 Survey #5)
Improve the conditions of the room (lighting, etc.)	1	"Have in a more accessible space - may be downstairs!" (MOS 5.1 Survey #7)

5. How could the programmatic model be refined so that it better achieves the stated goals and objectives and better meets the needs of the key program stakeholders (including adult learners, museum educators, and nano-researchers)?

The presentation and play

- Educators suggest making changes to the presentation in order to make sure that basic nanotechnology was included and to reinforce content in the play.
  - One educator said, "RFIDs and smart dust—putting that in the talk would be helpful. Anything you can pull out of the play and cite examples in the talk and scenario would be helpful" (MOS 5.1 debrief).
  - Another educator stated, "For versions of the talk in the future it might make sense to talk less about definitions of nano and give more examples of nano" (MOS 5.1 debrief).

- Although other materials were translated and available in Spanish, the play was the only aspect of the MOS 5.1 forum during which the Spanish was used and most stakeholders did not feel the other translated materials were useful or applicable. Therefore, in the future it will be important to recruit a Spanish-speaking audience so these materials can be used (Table 23).
  - When asked about the helpfulness of having materials in English and Spanish, 5 of 7 respondents thought having the play in both languages was helpful. However, between 1 and 4 respondents said that having other materials available in Spanish was "not applicable" for them.
  - One educator said, "I didn't do one thing that would address [possible inattentiveness during a presentation using a language not spoken by a participant]. I was going to produce basic background materials, but that people could read during the other play, but there was no time and I didn't do it" (MOS 5.1 debrief).
  - Another educator stated, "In particular, I think it is important to have a truly bilingual audience if we are going to do a bilingual forum" (MOS 5.1 speaker email).

Table 23. Exit survey: Participant ratings of helpfulness of translated materials.[24]

	# of Survey Respondents Choosing "Agree" or "Strongly Agree"	# of Survey Respondents Choosing "Disagree" or "Strongly Disagree"	# of Survey Respondents Choosing "Not Applicable"
Live presentation	4	1	3
Presentation slides[25]	3	0	4
Play	5	2	1
Question and answer period	3	1	4
Written materials	4	2	2
Small group discussion	3	1	4
Wrap-up	3	1	4

Conclusion and Recommendations about the Forum Format and Content

- Educators felt that the presentation could be improved by adding different content. Therefore, consider modifying future presentations by doing the following:
  - Make sure that speakers discuss a variety of nanotechnology applications during their presentations.
  - Make sure that the speakers see the script of the play and scenarios before the forum.
  - Ensure that the content of the presentations match the play and scenarios as much as possible.
- Participants and educators felt that the forum did not fully use both languages throughout the forum and when Spanish was used it was not always helpful. Therefore, consider changing the bilingual aspect of the forum by doing the following:
  - Make sure there will be a more bilingual audience by checking registration lists.
  - Provide background materials at discussion tables for people who only understand one of the languages to read during the less familiar language portion(s).

[24] Participants were asked to rate these questions on a scale of 1 to 4 where 1 is "Strongly Disagree," 2 is "Disagree," 3 is "Agree," and 4 is "Strongly Agree."
[25] N=7

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Appendix A: Other Information about the Forums

Table A1. Dates and locations of the forums included in this evaluation.

Forum	Location Where the Forum Took Place	Date
SMM 3.4	Science Museum of Minnesota	9/18/2008
ASTC 3.1[26]	The Franklin Institute[27]	10/16/2008
MOS 5.1	Spontaneous Celebrations[28]	10/9/2009

Table A2. Data collection instruments used at each of the study forums.

	Registration Surveys	Pre/Post Exit Surveys	Observations	Evaluator Discussion Debriefs	Educator Debriefs	Speaker Follow-up Email
SMM 3.4	X	X	X	X	X	X
ASTC 3.1	X	X	X	X	X	X
MOS 5.1	X	X	X	X	X	X

[26] "ASTC" stands for Association of Science-Technology Centers. This forum occurred as a part of the 2008 ASTC Annual Conference.
[27] The Franklin Institute is a science museum located in Philadelphia, PA.
[28] Spontaneous Celebrations is a community center located in the Jamaica Plain neighborhood of Boston, MA.