exploratorium

The Exploratorium's Explainer Program: Results from a Longitudinal Study

A Report Submitted to the Koret Foundation

July 15, 2005

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Executive Summary

This report details the results of a five-year longitudinal study on the Explainer program at the Exploratorium. Explainers from the summer 1999, fall 1999 and spring 2000 cohorts were interviewed before and after their first semester of work as an Explainer, then followed up with additional interviews three more times at intervals of from one to three years. Additional supplemental data were gathered from a larger set of Explainers via surveys that were administered to these same cohorts before and after their first semester of work, and to a set of Explainer alumni who had been out of the program for periods of time that ranged between 3 and 35 years.

The study sought to find out how the Explainer program is viewed by its participants over time: when they speak of the program, what aspects do they mention; do they talk about these aspects positively or negatively; and are there any changes in perceptions of the program as Explainers move from youth into adulthood and on into their lives.

A second important goal was to discover whether former Explainers felt that the program had an impact on them in key aspects of their personal development, such as self-confidence and interpersonal skills, and if so, whether this impact was temporary or persisted over time.

The results of the study in terms of how the Explainer program is viewed were:

- Positive aspects were mentioned more frequently than negative aspects by almost a 3-to-1 ratio.

- More positive things tended to be said about the program as the amount of time between the interview and when the person was in the program increased.

- While Explainers who had just finished their first semester in the program rated their enjoyment of the job very positively, alumni who had been out of the program for years rated it more positively yet.

- Specific aspects that were mentioned especially often as being positive included teaching museum visitors, having the opportunity to learn science and getting feelings of pride, accomplishment, appreciation and respect from the job.

- The most common negative aspects that were mentioned were not being able to answer a question or in another way not knowing what they were doing, having problems with the work of other Explainers and having to deal with difficult visitors or visitors that don't respect them.

The results of the study in terms of impacts of the Explainer program were:

- All interviewed Explainers reported a positive impact of the program in the areas of self-confidence, interpersonal skills and school. Almost all almost reported a positive impact in the area of science or math skills and interests.

- These positive impacts appeared to persist over time. Explainer alumni reported impacts of the program in these areas and in their careers even after many years had gone by.

The Exploratorium's Explainer Program: Results from a Longitudinal Study

Main Report

Background

The Explainer program at the Exploratorium began when the museum first opened in 1969. Explainers are high school students working as paid staff whose role in the museum is to assist visitors in learning about, engaging with and exploring the exhibits. The students are not expected to be science experts, and are not selected on the basis of their skills in science. Instead, new Explainers are asked to be willing to learn and to communicate whatever knowledge they have with the public through demonstrations and one-on-one interactions out on the museum floor.   By using youth as its frontline staff with visitors, the Exploratorium seeks to reinforce the message that science is accessible to everyone and can be understood and explained by people who are not stereotypical scientists. In documenting how the Explainer program works, Klages, Librero and Bell write, "When an Explainer group is out on the floor, what the public sees is that learning about the world and being an active participant in it is not limited by age, gender or environment. At the Exploratorium at least, it is an opportunity that is open to everyone" (Klages, Librero & Bell, 1995).

Besides benefiting the museum, the Explainer program is also a youth development program. For each semester -- a four-month period beginning in the summer, fall or spring -- a new cohort of Explainers is chosen (including a few re-hires from the previous semester) who are ethnically diverse and have different, and complementary, strengths and weaknesses in terms of their experiences with science, with dealing with the public and with teaching.   It is hoped that by their participation in the program, Explainers will learn from each other and from other museum staff, will develop their interests and skills, will gain self-confidence and experience overall personal growth (Librero, 2005).

A previous study on the Explainer program (Diamond, St. John, Cleary & Librero, 1987) looked at perceptions of the Explainer experience and the long-term impact of the program over a large set of former Explainers who began working in the program from 1969 through 1985. Using surveys and interviews, the study found that the Explainer program did have long-term impacts on former Explainers' interest and skills in science, their skills with teaching and communication and their self-confidence. Specific aspects of the Explainer experience that were recalled by former Explainers as being significant components of the program included the need to read visitors' wants and needs and tailor an approach accordingly, the social cohesiveness of the Explainer group and support from the Explainer program administrative staff.

The Explainer program is constantly growing and changing in response to the needs of the museum and input from current and former Explainers. For example, starting in the late 1990's, Explainers were encouraged to stay on for longer periods of time so that

Explainer groups would be more experienced and have more continuity between semesters. At the same time, in order to combat the possibility of burnout, Explainers were given increased opportunities to participate in additional activities such as producing webcasts and working with other museum staff. In 1999, a new longitudinal study was launched in order to look at Explainers' perceptions of the Explainer program and its impact over time. Following on from the Diamond et al. study (1987), a mix of survey questions and interviews were employed, with one important difference: rather than gathering all the data retrospectively, Explainers were interviewed at the beginning of their participation in the program, after their first semester and then followed with three subsequent interviews over the next five years. In addition, surveys were given to current and former Explainers in order to get supplemental information from a wider range of program participants, from high school students currently or recently in the program to adults who last worked as Explainers 3 to 35 years ago.

Study Design

Longitudinal Interviews

Explainers beginning the program in the summer of 1999, fall of 1999 and spring of 2000 were recruited to be interviewed multiple times over the next five years. These Explainers were interviewed a total of five times:

- Pre-semester -- immediately prior to their first semester of work as an Explainer

- Post-semester -- immediately after their first semester of work as an Explainer

- One-year-out -- approximately one year after their first semester of work as an Explainer

- Two/three-years-out -- from two to three years after their first semester of work as an Explainer

- Five-years-out -- approximately five years after their first semester of work as an Explainer

In all five interviews, questions were asked to find out how the Explainer program was viewed by interviewees and whether the program had any impact on other aspects of the interviewee's life. However, as interviewees aged and the amount of time that had lapsed between their current lives and their time as an Explainer changed, the wording of the interview questions necessarily changed as well. See Appendix I for the specific question protocols used for the different interviews.

There were 25 Explainers recruited at the beginning of the study, of whom 11 (44%) made it all the way through to the end. Ten of these people participated in all five interviews, while one person missed the two/three-years-out interview due to difficulties in reaching him at that time period. Table 1 shows how many Explainers were recruited from each cohort at the beginning and how many made it through to the end of the study. The main reason for dropout from the study was inability to locate the person for the next

interview. No Explainers dropped out of the study through refusal to continue to participate.

Table 1: Attrition Rates for Interviewees

Cohort	Study Beginning	Study End	Attrition
Summer 1999	10	5	5 (50%)
Fall 1999	6	3	3 (50%)
Spring 2000	9	3	6 (67%)
Total	25	11	14 (56%)

The interviews were transcribed and then coded for aspects of the program and for impacts of the program. Coding was independently done by two coders who then met and came to consensus on a final set of codes. Despite the differences in questions between some of the interviews, all interviews were coded in the same way for aspects of the Explainer experience. Impacts of the Explainer program were also coded identically across interviews with the exception of the pre-semester interview, which was excluded from the impact coding as interviewees had not yet experienced the program at the time of that interview.

Aspects of the Explainer Experience

Coders recorded each aspect of the Explainer program that was mentioned in the interviews, for example working as a team or feeling pride in the Explainer job. For each aspect, coders also categorized the interviewee's overall view of that aspect as either positive, negative, mixed (both positive and negative) or no evidence (the coder is unable to find evidence for making a determination as to how the interviewee views the aspect).

Impacts of the Explainer Program

Coders recorded all instances of an interviewee saying they felt the Explainer program had an impact on their lives in one of the following categories:

- self-confidence
- interpersonal skills
- science or math skills and interest
- career
- school
- recreation
- decision-making skills
- community service

In addition to recording the impact, coders categorized whether the interviewee felt the impact was positive, negative, or mixed (both positive and negative). Again, a code of no

evidence was assigned when the coder was unable to find evidence for making a determination as to how the interviewee viewed the impact.

It should be noted that only "impact present" instances were coded; that is, cases where the interviewee explicitly said they believed the Explainer program had had an impact on their lives in one of the above categories. Failure of an interviewee to mention an impact is not the same as the person stating that there was no impact, therefore the impact results should be viewed only as instances of definite impacts rather than as data describing where impacts were made and where they were not made.

Surveys

In order to supplement the information from the longitudinal interviews with data from a larger set of Explainers, a survey was developed and administered to 42 Explainers from the summer 1999, fall 1999 and spring 2000 cohorts immediately prior to their first semester in the Explainer program and immediately after the semester was over. In addition to some demographic and open-ended questions, the survey contained a set of 5-point Likert scale items measuring Explainers' agreement with a series of statements about the Explainer job, science, school, interpersonal skills and self-confidence.

In 2005, alumni from the Explainer program whose contact information was available were sent an email invitation to take a survey over the internet that contained these same items plus some new additional items. The invitation was sent to 143 alumni, 45 of whom took the survey (response rate of 31%). Because the goal was to obtain data only from adult alumni, one person was subsequently removed from the data set because she was under the age of 18. The final data set therefore contained 44 alumni.

Because the survey items were originally designed for high school students, it was necessary to slightly change the wording for some items in order to make them meaningful for adults. For example, one original item was "I plan to graduate from high school." The parallel form of this item that appeared on the alumni survey was "I plan to graduate / did graduate from high school."

The full text of the pre-semester, post-semester and alumni surveys can be found in Appendix II.

Results

Longitudinal Interview Results

Demographics of Interviewed Explainers Versus All Explainers

Table 2 shows the gender and ethnicity of Explainers in the longitudinal study compared to all Explainers from the summer 1999, fall 1999 and spring 2000 cohorts for whom data were available, along with their age at the time of their first semester in the program.

**Table 2: Demographics of Interviewed Explainers
Versus All Explainers**

	Interviewed Explainers		All Explainers	
	n	**%**	**n**	**%**
Gender				
Male	5	45%	26	59%
Female	6	55%	18	41%
(Missing)	0	0%	1	2%
Ethnicity				
African-American	1	9%	6	13%
Asian/Pacific Islander	5	45%	16	36%
Caucasian	3	27%	14	31%
Other	0	0%	6	13%
(Missing)	2	18%	3	7%
Age				
14	1	9%	12	27%
15	3	27%	15	33%
16	3	27%	7	16%
17	2	18%	7	16%
18	1	9%	3	7%
(Missing)	1	9%	1	2%
Total	11	100%	45	100%

Aspects of the Explainer experience

Many aspects of the Explainer experience were mentioned several times in the interviews by multiple people.   Table 3 lists aspects that were viewed positively by interviewees and mentioned most often over the five interviews. For each aspect, the percent of interviewees who mentioned the aspect in at least one interview is given. In addition, the percent of interviewees who mentioned the aspect during the pre-semester, post-semester, one-year-out, two/three-years-out and five-years out interviews is shown.

Table 4 shows the same information for the aspects that were viewed negatively by interviewees and mentioned most often.

Table 3: Frequently Mentioned Positive Aspects of the Explainer Experience:
% of Interviewees and When Mentioned

Positive Aspects	% of Interviewees Who Mentioned Aspect At Least Once	% of Interviewees Mentioning Aspect During Interview				
		Pre-Semester	Post-Semester	1-Year-Out	2/3-Years-Out	5-Years-Out
Teaching visitors a rewarding experience	91%	55%	18%	36%	18%	27%
Opportunity to learn science	91%	45%	36%	18%	9%	18%
Get feelings of pride, accomplishment, appreciation and respect	82%		55%	55%	18%	
Good to do demonstrations	64%		18%	45%	18%	36%
Exploratorium is a good place to work	55%	36%		9%		27%
Good to do work that involves science	45%	27%		18%	9%	
Can get to know other Explainers	45%	18%	36%	18%		9%
Liked specific exhibits	45%			18%	9%	27%
Explainer group is diverse	45%			18%	27%	9%
Explainer job is fun	36%	18%		27%	18%	18%
Learn by spending additional time with the exhibits	36%		18%		18%	9%
Sense of cohesiveness with Explainer group	36%			36%		9%
Enjoyed Explainer job	36%				18%	27%
Quality of the training was good	36%			9%		27%
Learned to deal with lots of different types of people	36%		9%	9%	9%	18%
Explainer job different from other jobs	27%				27%	9%
Learn from other Explainers	27%			9%	18%	
Need to approach teaching in different ways for different visitors	27%		27%			
Exploratorium is a place where you never stop learning	27%			27%		9%
Good to work on extra things like webcast and play	27%			18%	9%	18%

Table 4: Frequently Mentioned Negative Aspects of the Explainer Experience:
% of Interviewees and When Mentioned

Negative Aspects	% of Interviewees Who Mentioned Aspect At Least Once	% of Interviewees Mentioning Aspect During Interview				
		Pre-Semester	Post-Semester	1-Year-Out	2/3-Years-Out	5-Years-Out
Can't answer a question / don't know what doing	64%	9%	18%	45%	27%	9%
Problems with the work of other Explainers	64%		9%	55%	9%	
Have to deal with difficult visitors	55%	36%	18%			9%
Visitors don't always respect or want help from Explainers	55%	18%	27%	9%	9%	9%
Work got boring over time	36%		9%	36%	9%	
Non-Explainer museum staff did not always treat Explainers with respect	36%			18%	9%	9%
Can get away with not doing work	27%	9%	18%	18%		
Needed more training	18%			18%	18%	9%

As can be seen from the above tables, an interesting finding is that many aspects that were first mentioned in the pre-semester interviews, and were thus based on expectations for the job and not on actual job experience, did nevertheless carry through into subsequent interviews.

Aspects of Teaching and Learning. Almost all interviewees talked about teaching visitors and having the opportunity to learn science as being positive experiences. Doing demonstrations was also frequently mentioned as a positive experience. The quality of Explainer training was seen as good, but two interviewees (18%) mentioned a need for more training than they received. Some interviewees also noted that it was difficult when they couldn't answer questions or had to deal with difficult visitors, and that the work became more boring over time.

Aspects of the Explainer Group. Working with other Explainers was also mostly mentioned as a positive experience, with interviewees talking about making friends, feeling a sense of cohesiveness with other Explainers and appreciating the diversity of the Explainer group. On the negative side, some interviewees talked about specific problems they had with the work of other Explainers, and complained that the set-up of the program allowed some people to get away with not doing any work.

Aspects of Feelings. Over 80% of interviewees talked about one or more times when they had positive feelings when working as an Explainer, such as pride, appreciation, respect and accomplishment on the job. However, some interviewees also talked about occasionally feeling a lack of respect from museum visitors and from museum staff who were not associated with the Explainer program. Interviewees usually attributed this lack of respect to their youth.

Frequencies of Mentioning Positive and Negative Aspects. Overall, positive aspects were mentioned more frequently than negative aspects by almost a 3-to-1 ratio. Beginning with the post-semester interview, there also appeared to be a trend over time: in later interviews, the percent of the mentioned aspects that were viewed positively increased and the percent that were viewed negatively decreased.   This may have been due to a preference to speak more about positive things as the time between the interview and the Explainer experience increased, or it may mean that the Explainer experience is viewed more positively as time passes.

Figure 1 illustrates the percent of positive vs. negative aspects that were mentioned for each interview.

Figure 1: Percent of Positive and Negative Aspects Mentioned Over Time
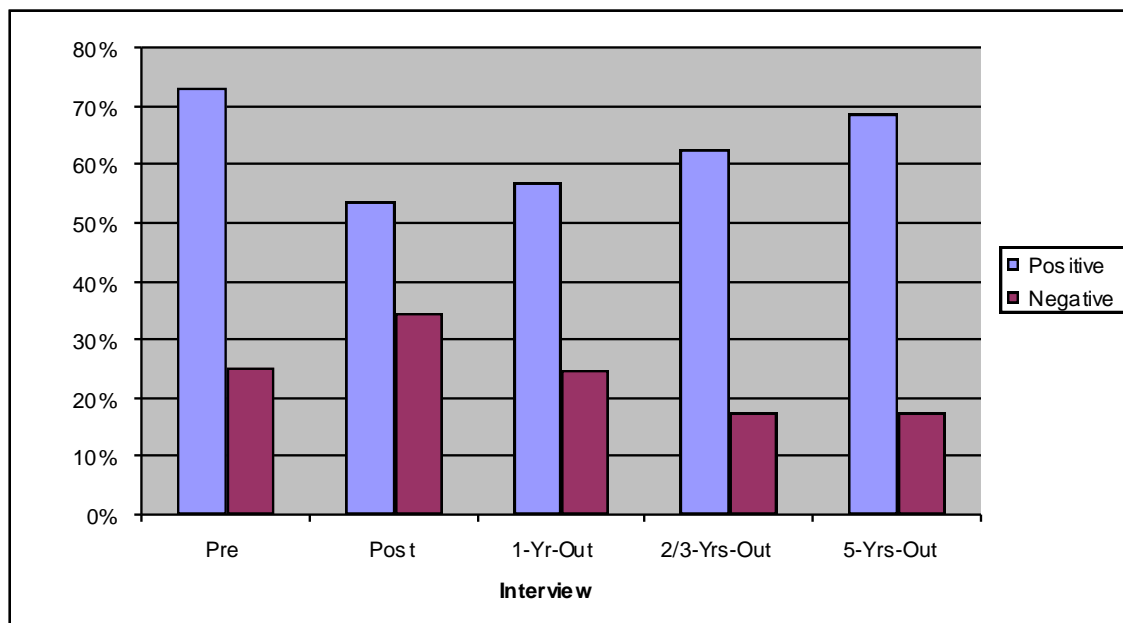
Impacts of the Explainer experience

In addition to mentioning aspects of being an Explainer, interviewees also felt that the Explainer experience had specific impacts in their lives. Almost all impacts (86%)

mentioned by interviewees were seen as positive, while just a few were coded as "mixed" (4%) or as "no evidence" (9%).

Only one interviewee spoke about an impact in a negative way. In the one-year-out interview, this person said that certain racial and sexual joking among the Explainer group made her feel uncomfortable, and in the two/three-years-out interview, she said that sometimes other Explainers made comments about her school that caused her to feel self-conscious.

Table 5 shows the categories of positive impacts that interviewees felt the Explainer program had on them and their lives. The percent of interviewees who spoke about an impact in the category at least once during one of the interviews is shown. Then for each interview (post-semester, one-year-out, two/three-years-out and five-years-out) the percent of interviewees who spoke about an impact in the category during that particular interview is shown. The pre-semester interview is not included as interviewees had not yet experienced the program at that time and therefore could not yet speak of any impact.

Table 5: Positive Impacts of the Explainer Program:
% of Interviewees and When Mentioned

Positive Impacts	% of Interviewees Who Spoke of Impact At Least Once	% of Interviewees Who Spoke of Impact At Each Interview			
		Post-Semester	1-Year-Out	2/3-Years-Out	5-Years-Out
Self-confidence	100%	73%	100%	45%	27%
Interpersonal skills	100%	73%	100%	73%	64%
School	100%	45%	55%	45%	45%
Science or math skills and interests	91%	73%	64%	45%	64%
Career	82%	9%	45%	27%	64%
Recreation	36%	9%	9%	18%	9%
Community Service	36%	0%	0%	27%	18%
Decision-making	18%	0%	0%	18%	0%

Strikingly, all 11 interviewees reported a positive impact of the Explainer program on their self-confidence, their interpersonal skills and their experience of school during at least one of the interviews. Almost all interviewees (10 out of 11) also reported a positive impact of the program on their science or math skills and interests. Most interviewees (9 out of 11) also felt that the program had a positive impact on some aspect of their career.

More specifics about the impacts interviewees spoke of within each category are given below:

Self-confidence. Interviewees talked about the program giving them greater beliefs in their own abilities, better self-worth and a stronger sense of their personal identity. For example, one interviewee said:

"I just think it was a really formative experience in giving me self-esteem and confidence in my own intellect, and that's stayed with me throughout since then."

Interpersonal skills. Interviewees spoke of a range of interpersonal skills that were improved, including being able to read people better, having better communication skills and being more comfortable with others from diverse backgrounds. A quote from an interviewee:

"I'm not as afraid of people as I used to be . . . I think it has helped me learn how to approach people and talk to people and not be so frightened of what they think. I think in general I have become less shy I would hope, or maybe better at expressing myself."

School. Interviewees spoke about it being easier to learn science because of their experience as an Explainer, of setting higher academic goals, of having stronger beliefs in their academic abilities and of learning responsibility that helped them manage their schoolwork.

"It's made me think about my academic goals . . . I feel like maybe I should take more units . . . most of the people I worked with . . . they want to achieve."

Science or math skills and interests. Interviewees spoke about increased interests and skills in science or math, and gave specific instances where something about their experience as an Explainer helped them with a current science or math problem. One interviewee had a particularly powerful experience:

"In Italy [for a choral trip] . . . everyone's bought like the laser pointers . . . and then I did a little mini-laser demonstration and I played with my class ring . . . I did like the whole entire demo that you could do without the supplementary things, and a bunch of kids were like, 'Whoa, that's cool, are you in physics?' I'm like, 'No.' They're like, 'Oh, are you going to take it next year?' I'm like, "Oh, I can't, I didn't meet their math requirements" . . . but like everyone thought I was so incredibly smart just for knowing that. It kind of like showed me that people think that to know a lot of cool stuff, that you have to be quote unquote a smart kid, be in like the hard classes, and working at the Exploratorium has showed me that you don't have to have a hard class . . . learning is so cool and like science is accessible and it's not just like formulas and books, and that has like opened me up, to like go out and find out what I'm actually interested in . . . that if there's stuff that you want to understand, like you can understand it."

Career. Interviewees spoke about learning specific skills that helped them on the job, particularly in terms of communication skills, and also talked about how the Explainer program has given them ideas for what they would like or not like in a job, for example doing teaching or not doing biology. One interviewee had a very direct and powerful impact of the Explainer program on her career path:

"I actually recently switched jobs because I was working for a bank and it was really horrible and I hated it and I thought wow, what do I want to be doing? Um, what's the best job I've ever had? And I thought back to the Exploratorium, and working with kids and educating people and working for a nonprofit were all things that were really standout positive experiences for me. So I went and found a job . . . and it's just so much better . . . and my experience at the Exploratorium was definitely what helped me. I think it's mainly responsible for helping me get this job and for even thinking of going for a position like this."

Decision-making skills. Although decision-making skill is an aspect of personal growth that is of interest in the study, it is very difficult to assess as people do not normally have good access to their decision-making processes or good knowledge of the factors that influence their decisions (cf. Tversky & Kahneman, 1981). Nevertheless, two interviewees were able to explicitly state that they felt the Explainer program had had an impact on their decision-making abilities by helping them act more independently and make autonomous decisions. As one interviewee put it:

"I feel like the groundwork was kind of laid for it there . . . my ability to kind of change my life and, and take more control over it and make it something that I want to do rather than what other people think that I should do."

Recreation. Some interviewees reported impacts of the Explainer program on their recreation, for example saying the Explainer program helped them in a chosen hobby by teaching them project management, or by helping them learn to balance work and play. Sometimes the impact was more direct, as in the case of this person who decided to take a metal-working class after watching people work in the Exploratorium shop:

"I have become interested in more hands-on things . . . I was inspired by some of the exhibits there. And so this summer I've been taking a metal-working class, which I found is really fun."

Community service. Four interviewees reported that the Explainer program had an impact on a volunteer experience, almost all of which involved working with kids and/or doing teaching. A typical example quote:

"After working at the Exploratorium I worked . . . it was like volunteer work, at the [public library] . . . Basically I tutored kids on how to use computers. So I used both of the skills of my interest in computers and also the skills that I learned from the Exploratorium, you know, people skills and helping people, teaching young kids."

Survey Results

Pre-Semester and Post-Semester Surveys

In order to get supplemental data from a larger set of Explainers than could be interviewed, a survey was administered to Explainers from the summer 1999, fall 1999 and spring 2000 cohorts immediately before their first semester in the program and immediately afterwards.

Results from the pre- and post-surveys were very similar overall. The largest changes over the semester were that Explainers felt they had learned more about teaching, were a little less concerned about the impression they made on others, were a little less interested in school and were a little more concerned about their appearance. Explainers also felt that they had gained skills over the semester that would help them later in school and beyond.

For a more detailed comparison of the pre-semester vs. post-semester survey results, please see "Explainers' Experiences One Year after Explaining: A Preliminary Analysis" (Gutwill, 2002).

Alumni Survey

A survey was given to Explainer alumni in 2005 in order to find out about perceptions and impacts of the program after many years had passed. Some survey items from the post-semester survey were included so that comparisons could also be made between people who had just experienced the program and those who experienced it a long time ago.

Alumni demographics. Explainer alumni who responded to the alumni survey began in the Explainer program between 1969 (the first year of the program, when the Exploratorium opened) and 1999. Table 6 gives the demographic breakdown of the respondants in terms of gender, ethnicity and age.

Comparison Between Alumni and Post-Semester Explainers. In order to investigate changes over time by Explainer alumni, Likert scale items that corresponded to the themes of the Explainer job, science, school, interpersonal skills and self-confidence were combined into subscales. These subscales were then analyzed for reliability using Cronbach's alpha. The interpersonal skills subscale had a reliability of less than .60, so no further analyses were done using that subscale. The other subscales had reliabilities ranging between .60 and .86.

Table 6: Demographics of Explainer Alumni Who Took Survey

	Explainer Alumni	
	n	**%**
Gender		
Male	18	41%
Female	26	59%
Ethnicity*		
African-American	4	9%
Asian/Pacific Islander	9	21%
Caucasian	23	52%
Hispanic/Latino	5	11%
Other	4	9%
(Missing)	1	2%
Age		
18-21	1	2%
22-25	2	5%
26-29	6	14%
30-35	19	43%
over 35	16	36%
Total	44	100%

* respondants were allowed to check more than one category for
ethnicity, so totals add up to more than 100%

The individual item statements used to construct each subscale are given below. Item statements that were phrased in the negative (e.g., "I feel self-conscious," "I didn't perform well") were reverse scored so that all items for a scale would score in the positive direction. In some cases, a slight change in the wording of an item was required on the alumni survey in order to make the item meaningful to adults. The items listed below are shown as they appeared on the alumni survey; when changes were made from the post-semester survey, they are marked with a "P" (for parallel form). See Appendix II for the original wording of these items on the post-semester survey. Items that were reverse scored are marked with an "R."

Explainer job subscale:
- I enjoyed working at the Exploratorium. (P)
- I enjoyed getting to know the other Explainers. (P)

Science subscale:
- I am interested in science.
- I believe that I can understand science.
- I don't read stuff outside of school / work that relates to science. (P) (R)
- I like to watch TV programs about science topics.
- I would like to have a career in science.

School subscale:
- I plan to graduate / did graduate from high school. (P)
- I plan to graduate / did graduate from college. (P)
- I don't / didn't like the academic part of school. (P) (R)
- I don't / didn't like the social part of school. (P) (R)
- I don't / didn't perform well academically in school. (P) (R)
- I usually feel / felt nervous when taking tests. (P) (R)

Self-confidence subscale:
- I feel self-conscious when I'm in a group of people. (R)
- I feel confident about my abilities.
- I often feel self-conscious. (R)
- I feel that I have trouble understanding things that I read. (R)
- I feel good about myself.
- I feel as smart as others.
- I feel concerned about the impression I make. (R)
- I am pleased with my appearance.
- I worry about what other people think of me. (R)
- I feel confident that I understand things.
- I feel unattractive. (R)
- I worry about looking foolish. (R)

Respondents were asked to rate each of the above items from 1 ("strongly disagree") to 5 ("strongly agree"). Reverse scored items were changed so that 1 meant "strongly agree" and 5 meant "strongly disagree."

Alumni had higher scores (more agreement) with the Explainer job subscale than did post-semester Explainers, suggesting that alumni viewed the job more positively: they were more likely to agree that they enjoyed working at the Exploratorium and they were more likely to agree that they enjoyed getting to know the other Explainers.   But overall, both groups indicated a generally positive view of the Explainer job, giving ratings that averaged greater than "4" ("agree") to these statements.

There were no significant differences between alumni and post-semester Explainers on the other subscales.

Figure 2 summarizes the comparison between how post-semester Explainers answered on these subscales and how Explainer alumni answered.

Figure 2: Scores on Subscales for Post-Semester Explainers and Explainer Alumni
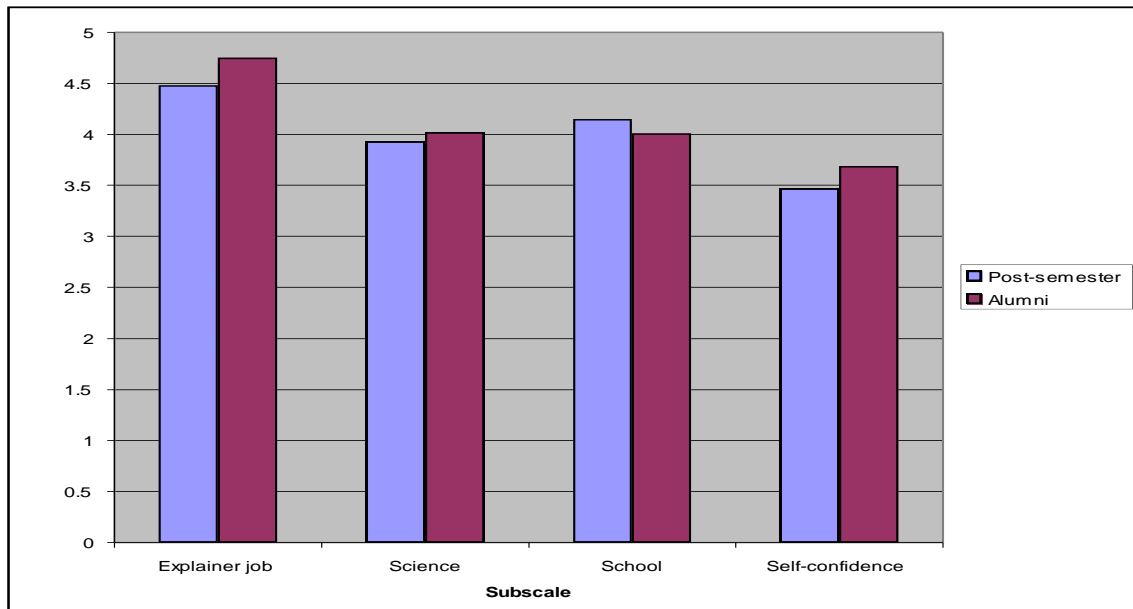
Impact of Explainer Program on Alumni. The alumni survey included some new items that asked respondents about impacts of the Explainer program on their current lives. Four were Likert scale items that asked respondents whether skills they learned as an Explainer had helped them in the past year. Most respondents agreed that they had learned things from the Explainer program that were still having an impact on their current lives. Table 7 shows what percent of respondents agreed or disagreed with each specific impact statement.

Table 7: Explainer Alumni Agreement to Statements about Impact of the Explainer Program Over the Past Year

Item statement	strongly disagree	disagree	neutral	agree	strongly agree
As an Explainer, I learned science ideas that have helped me in the past year.	2%	14%	14%	41%	29%
As an Explainer, I learned general skills that have helped me in the past year.	0%	2%	7%	44%	47%
As an Explainer, I learned things about getting along with people that have helped me in the past year.	0%	2%	15%	51%	32%
As an Explainer, I learned decision-making skills that have helped me in the past year.	0%	7%	36%	41%	17%

Finally, the survey asked this open-ended question: "Is there anything that you learned or experienced while you were in the Explainer program that you feel is valuable to you now, in your current life? If so, what is it and why is it valuable to you now? If not, why do you think that is?"

Thirty-six respondants (82%) wrote about ways in which they felt their experience in the Explainer program was still valuable to them in their current life. The remaining respondants simply left the question blank; no one said the program did not have a current impact.

Some examples of what the alumni wrote:

"First time I had to interract with an extremely diverse group of people. Being an Explainer really taught me to keep an open mind towards academics, and towards others. Was truly a defining experience for me."

"I really value my Explainer experience. I feel that it gave me a lot of confidence in learning more about the fields of science, professionalism, working with the public, and meeting new friends. I am still nervous when giving a presentation, but I tribute the skills I have learned to greatly helping me in my current job as well as in life. "

"The Explainer program was really my first introduction to the world of science as a possible career. It was the first time I felt that being interested in science was considered "cool" and that's a pretty huge thing for a self-conscious high school student. I learned how to interact with the general public, speak in front of groups, break down scientific ideas into manageable and understandable chunks, and gauge the teachability and interests of my audience. All of these skills I use on a daily basis in my career. "

"I grew up in a privileged home, where I didn't meet too many other kids from working class families. . . What was so great about the Exploratorium, was that it broke down the usual barriers of class and race; there was such a vital utopian cast to its programs and ideals . . . I try to bring that same openness and humanity to interviews and the stories I write. If I'm able to connect with people at all, it's because the Explainer program, under the direction of Darlene Librero, was the place where I first understood what it meant to listen."

"I realized years later that the Explainer program wasn't only a 'summer job' . . . It wasn't just a place to learn to explain science and human perception to the visitors. It really did capture and prepare young people for life and the world around them."

Conclusions

The results of the longitudinal data, both interviews and surveys, show that the Explainer program does have positive impacts that persist over time. The program's most frequent impacts were in the areas of self-confidence; interpersonal skills; school; and science or math skills and interests.

Positive aspects of the Explainer experience were mentioned more frequently than negative aspects by almost a 3-to-1 ratio. The aspects that seemed to be most appreciated by former Explainers had to do with the experience of learning something and then teaching it to others; dealing with diverse fellow Explainers and with the public; and working in a place where the job gave feelings of pride, respect and accomplishment.

Although far fewer than the positive aspects, it is important to remember that there were also some negative aspects of the program that were reported by interviewees. In thinking towards future development of the Explainer program, it would be helpful to review the negative things that were brought up and to think of ways in which these problems might be addressed or mitigated.

More than one person said in later interviews and on the alumni survey that the Explainer job was "the best job I ever had."   Based on evidence from both the interviews and the surveys, this appreciation of the Explainer experience and what it offers appears to grow over time. It would be interesting to do additional studies on alumni in the future, for it seems that the effects of a youth development program may not always be apparent until its participants are no longer youth.

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Appendix I: Interview Questions

<u>**Pre-Semester Interview**</u>

Becoming an Explainer

- Why did you become an Explainer? What attracted you to it?
- What do you think will be the best part of being an Explainer? What do you look forward to?
- What do you think will be the worst part of being an Explainer?

Your Views on Science

- People have different ideas of what science is; How would you define it?
- *What do you think are some of the ways that science is important to society?*
- *What are some ways it is important to your life?*
- What do you think would be a scientific way of figuring something out?

Your Views on Art

- People have different ideas of what art is; How would you describe what art is?
- *What do you think are some of the ways that art is important to society?*
- *What are some ways it is important to your life?*
- How do you think you can use art to learn about something?

Your Views on School

- How well would you say you normally do academically?
- What do you think are the reasons for your academic level?
- What do you like about school?
- What do you dislike about it?

Future Plans / decisions

- Do you have any plans for yourself after high school? What do you see yourself doing? (For example: going to college, choosing a type of work, choosing a subject of major study, etc.)
- In the next couple of years, you're may have to make some fairly big decisions about school or career or both. When you're faced with a big decision, how do you usually go about making it? [Follow-up if they don't understand: Are there steps you usually take?]
- What, if any, noteworthy decisions have you made recently? [Follow-up examples if they don't understand: deciding whether to work here or somewhere else, deciding on the topic for a project in school]
- How did you arrive at that decision?

Vignettes (see Post-semester interview questions below in "Pre/Post Vignettes")

Post-Semester Interview

Being an Explainer
- What has been the best part of being an Explainer?
- Has there ever been a time or times when you really felt appreciated or acknowledged for your skills or abilities by another explainer or another person or people at the museum? [Follow-up if yes.] What was that? Has that had any effect on you or your life outside the Exploratorium? If so, how?
- What has been the worst or most difficult part of being an Explainer?
- As an Explainer, what do you feel you have learned about communicating with people or teaching them about something?

Your Views on Science
- People have different ideas of what science is; How would you define it?
- *What do you think are some of the ways that science is important to society?*
- *What are some ways it is important to your life?*
- *What do you think would be a scientific way of figuring something out?*
- Has your time as an Explainer affected your views about science? If so, what led to that change?

Your Views on Art
- People have different ideas of what art is; How would you describe what art is?
- *What do you think are some of the ways that art is important to society?*
- *What are some ways it is important to your life?*
- *How do you think you can use art to learn about something?*
- Has your time as an Explainer affected your views about art? If so, what led to that change?

Your Views on School
- How well would you say you normally do academically?
- What do you think are the reasons for your academic level?
- Has your performance in school changed during the time you've been an Explainer? If so, what led to that change?
- What are some of the things you like about school?
- What are some of the things you don't like about school? [prompt for why]
- Have your views about school changed during the time you've been an Explainer? If so, what led to that change?

Future Plans / decisions
- Do you have any plans for yourself after high school? Like, what do you see yourself doing? (Probe on Work, probe on School. For example: going to college, choosing a subject of major study, choosing a type of work, etc.)

- Now I'd like to ask you about how you make decisions. First, I was wondering, what decisions have you made recently, if any? Like decisions about work or deciding on the topic for a project in school or going out for a sport or something.
- [If recently made a decision] How did you go about making that decision? Were there any steps you took to figure it out? [If no recent decision] When you're faced with a big decision, how do you usually go about making it? Are there steps you usually take?

Relating to others
- What have you learned about getting along with other explainers?
- Are there people in the Explainers program who you feel you can talk to about personal stuff? [If yes, Was there anything about the program itself that helped you feel more comfortable?   If No, Do you have any sense about why that is?]
- What, if anything, have you learned about how people learn?

Changes to the program

- If you had Darlene's job, what changes would you make to the program? (prompt once)
- Is there anything else about the program or about your experiences that you'd like to tell me?

<u>**Pre and Post Vignettes**</u>

1. An Explainer, Rhonda, is performing a Cow's Eye Dissection, and she's playing with the gooey stuff from inside the eye. A fifty-year-old visitor from England, Mrs. Halifax, approaches. When Mrs. Halifax sees what Rhonda is doing, she loudly exclaims "Oh my GAWD! What are <u>doing</u> with that?"
If you were Rhonda, what would you say to Mrs. Halifax?
If you were Rhonda, how do you think you would feel in this situation?

2. You're working at the Drawing Board on a busy weekend day. The sign-up sheet is filled with names. One couple has signed up their son for a 1:10pm appointment at the Board. They miss the appointment, but show up at 2:00pm saying that they were having lunch and forgot about the appointment. You tell them that there's no more room for them today. The mother becomes red in the face and says angrily, "That's not good enough! I can't believe that you can't fit us in for five minutes!"
What would you say to the mother in this situation?

4. Two Explainers, Steve and Kaiko, are doing the Electricity Demo for a family made up of a mom, a dad and three kids. During their explanation of one of the exhibits, the dad interrupts and asks, "What about the inductance produced by the current's magnetic field? Isn't that going to slow things down?" He pauses and then asks, "Do you really know how all this stuff works?"
If you were Steve or Kaiko, what would you say in response to the father's question?

How do you think you would feel if you were in this situation?

5. You're in the sound section, and you overhear a man and a woman talking about an exhibit. It seems to you that they don't understand what's going on.
Would you say anything to them? If so, how would you start? If not, why wouldn't you say anything?

6. It's a particularly crowded afternoon at the Exploratorium, and there are lots of teenagers walking around in groups of five to ten. Some of the groups are pretty rowdy. You and another explainer approach one group near the back of the museum that is taunting a visitor about the geeky clothes and glasses he is wearing. They're yelling names at him and they've sort of backed him up against an exhibit.
What would you do in this situation?
[Probe for the steps they'd take over time]

7. You walk over to the Momentum Machine exhibit and a woman approaches you. She's upset and says that a teenage boy keeps cutting the line and won't let the younger children on the machine. The boy is currently off the machine, but is standing nearby watching. The woman asks you to do something about the situation.
What would you do?
What would you say to the woman?
What, if anything, would you say to the teenage boy?

<u>**One-Year-Out Interview**</u>

1. LIFE AS AN EXPLAINER

I was thinking we could start off talking about your time as an explainer.

Like, how did you end up working as an Explainer? What led to that?

Like thinking back, do you remember a time when being an explainer wasn't just any old job, but was more than that?
[Prompt: A time when you weren't just going through the motions, but you felt like you were really part of something.]
[Prompt: Was there a day that was especially memorable for you?]
[Prompt: It doesn't actually have to be about explaining, but just had to do with working at the museum.]

Probe: What happened? Could you walk me through the whole thing? I'm really interested in the details.

2. EXPLAINING

And how about explaining. Can you remember a time when you felt like you had explained something really well?
[Prompt: If you can't think of a particular time, how about a particular subject — do you feel like there was a certain topic that you've explained well? Do you remember anybody's responses to you while you were explaining that?]

Probe: What were you talking about? Who were you talking to?

3. SELF-IDENTITY CHANGES

Was there any change in the way you thought about yourself as a result of the program?
[Prompt: Like, did you learn anything about yourself?]

4. CURRENT ACTIVITIES

I'd like to know what you're up to these days. Can you tell me about some of the activities that you're involved in and the responsibilities you have? [Prompt: Like, what are some of the things you're into these days, like with your family or friends or school or work or anywhere?]

[Prompts: Who do you do that with?]
[If no mention of school or work: And how about school / work?]

[If they give a list of items, probe for first, last or entry they seem most excited about.]

5. SELF-IDENTITY NOW

So with all these activities that we've been talking about, do you feel like there's an activity that really speaks to who you are.

[Prompt: Was there a day that was especially memorable for you?]

Probe: What happened? Could you walk me through the whole thing? I'm really interested in the details.

6. CHALLENGES

I'm wondering if, in any aspect of your life, there's been a time recently when you felt you really stretched yourself. [Prompt: You did something even though it was gonna be a big challenge for you.]

7. DEMOGRAPHICS

OK, now I want to shift gears and just ask you a bunch of brief questions.

- When did you stop working as an explainer? Do you remember what month and year that was?
- Are you going to college or are you planning to go? Where?
- What is (will be) your major?
- What is your expected year of graduation (from HS or college)?
- What do you think you might want to do for a career? (if not already covered in interview)?

Two/Three-Years out and Five-Years-Out Interviews

1. WHAT DOES DOING THIS INTERVIEW BRING UP?

What thoughts or feelings, if any, did you have knowing that we were going to do this interview today, either about your time as an explainer, or your life now?
      [Prompt: If so, why do you think that particular thought or feeling came up for you at this point in your life?]

(Maybe ask if they are still committed to going through with the interview- or ask if this interview will be helpful to them while they are in this process? If not, choose a different time, etc…)

2. CURRENT ACTIVITIES

In general, I'd like to know what you're up to these days. Can you tell me about some of the activities that you're involved in and the responsibilities you have? [Prompt: Like, what are some of the things you're into these days, like with your family or friends or school or work or anywhere?]

Personalized questions here based on previous interview, with questions like "When you were interviewed last time you were in school at Cal Poly Pomona. Sounds like you're now at UC Santa Cruz. Why did you transfer?

What are you up to in terms of education these days?
[Prompt: How does college compare to high school? Is it more or less like learning as an explainer at the Exploratorium? If they are working, ask What is like for you to be working doing x? How is it like or unlike your job as an explainer?]

    What are you thinking about your career or future job options at this point in your life?

3. BRIDGING CURRENT LIFE TO EXPLO/EXPLAINER DAYS/RELATIONSHIP TO SCIENCE

    Is there any aspect of your experience as an explainer or working at the Exploratorium that has been valuable to you lately?
[Prompt: Can you give an example of how that manifests? (Or what that looks like?)
Or, personalize a question here, such as "In your last interview you said that working as an explainer helped you overcome stage fright when talking to groups of people. What do you think about that now?"]

"Does science enter into your life these days?" or "Is science a part of your life these days in any way?" [Prompt: Has any current science interested you? Does it remind you of anything you encountered while working as an explainer?]

Do you still visit the Exploratorium these days? Why or why not? What do you think about the museum now?

4. ONGOING ISSUES/CHALLENGES & LAST THOUGHTS

Are there any challenges or issues in life, school or work that you feel like you have been dealing with since you were an explainer? If so, how has your thinking or feeling about them evolved?

Do you have any other thoughts at this point in your life about your experience working at the Exploratorium as an explainer? i.e. things that contributed to your development that we didn't ask about specifically, or things that stand out in your memory as being particularly important.

What do you feel was the most important thing you learned while you were in the Explainer Program?

5. DEMOGRAPHICS

OK, now I want to shift gears and just ask you a bunch of brief questions.

- When did you stop working as an explainer? Do you remember what month and year that was? (just confirm and/or clarify this on tape) (did you work in other areas of the museum? And for how long).
- Are you going to college or are you planning to go? Where? (if not covered in int.)
- What is (will be) your major?
- What is your expected year of graduation (from HS or college)?
- What do you think you might want to do for a career? (if not already covered in interview)?

Appendix II: Survey Questions

<u>**Pre-Semester Survey**</u>

1. Why did you become an Explainer? What attracted you to the job?

2. What do you think will be the best part of being an Explainer? What do you look forward to?

3. What do you think will be the worst part of being an Explainer?

4. What, if any, concerns do you have about being an Explainer?

5. Do you consider yourself someone who particularly likes science? (circle one)
    Yes   No

    5a. What, if anything, interests you about science?
    5b. What, if anything, turns you off about science?

6. Have you made any big decisions recently about your education? (circle one)
    Yes   No

(FOR EXAMPLE, HAVE YOU DECIDED WHETHER OR NOT TO FINISH HIGH SCHOOL, WHETHER TO GO TO COLLEGE, WHAT SUBJECTS TO STUDY/MAJOR IN, ETC.?)

    If Yes, what was the decision(s) you made?

7. Have you made any big decisions recently about your career? (circle one)
    Yes   No
    (For example, have you decided what kind of work you want to do in the long term, what kind of work you plan to do in the short term, etc.?)

    7a. If Yes, what was the decision(s) you made?

    7b. If you haven't made any decisions about career recently, what do you think you might want to do in terms of a career? (Please put down anything that you are considering.)

    7c. When you are faced with a big decision, how do you usually go about deciding? Are there any steps that you usually take?

PLEASE USE THE 5-POINT SCALE TO INDICATE YOUR AGREEMENT OR DISAGREEMENT WITH EACH STATEMENT.

Circle the number that best indicates your response.

		strongly disagree	disagree	neutral	agree	strongly agree
8	I am excited about working at the Exploratorium.	1	2	3	4	5
9	I have some concerns or worries about working at the Exploratorium.	1	2	3	4	5
10	I am interested in science.	1	2	3	4	5
11	I am interested in art, music and/or theatre.	1	2	3	4	5
12	I enjoy working with people.	1	2	3	4	5
13	I plan to graduate from high school.	1	2	3	4	5
14	I plan to go to college.	1	2	3	4	5
15	I feel self-conscious when I'm in a group of people.	1	2	3	4	5
16	I am curious about how things work.	1	2	3	4	5
17	I enjoy teaching people about stuff that I understand.	1	2	3	4	5
18	I look forward to getting to know the other Explainers.	1	2	3	4	5
19	I like the academic part of school.	1	2	3	4	5
20	I like the social part of school.	1	2	3	4	5
21	I believe that I can understand science.	1	2	3	4	5
22	I read stuff outside of school that relates to science.	1	2	3	4	5
23	I like to watch TV programs about science topics.	1	2	3	4	5
24	I like spending time with groups of people.	1	2	3	4	5
25	I like playing sports.	1	2	3	4	5
26	I perform well academically in school.	1	2	3	4	5
27	I am interested in political or social issues.	1	2	3	4	5
28	I enjoy reading.	1	2	3	4	5
29	I usually feel confident when taking tests.	1	2	3	4	5
30	I would like to have a career in science.	1	2	3	4	5

HOW DO YOU SOLVE DIFFICULT PROBLEMS?

For example, suppose you're deciding what to do with your life after high school. There are several options available to you, but none of them is perfect. Think of this situation when responding to the statements below.

When faced with a difficult problem...

		strongly disagree	disagree	neutral	agree	strongly agree
31	I look at several solutions to the problem, and then make a final decision.	1	2	3	4	5
32	I make a final decision without giving much thought to the problem, based on what seems right to me at the time.	1	2	3	4	5
33	I think about different courses of action and then make a final choice.	1	2	3	4	5
34	I think hard about the problem and its possible solutions, and cannot decide what to do.	1	2	3	4	5
35	I come up with a final decision without having checked, or even searched for very many possible solutions.	1	2	3	4	5
36	I give a lot of time and thought to the problem and its possible solutions, make a decision, and change it more than once.	1	2	3	4	5

HOW DO YOU FEEL ABOUT YOURSELF?

		strongly disagree	disagree	neutral	agree	strongly agree
37	I feel confident about my abilities.	1	2	3	4	5
38	I often feel self-conscious.	1	2	3	4	5
39	I feel that I have trouble understanding things that I read.	1	2	3	4	5
40	I feel good about myself.	1	2	3	4	5
41	I feel as smart as others.	1	2	3	4	5
42	I feel concerned about the impression I make.	1	2	3	4	5
43	I am pleased with my appearance.	1	2	3	4	5
44	I worry about what other people think of me.	1	2	3	4	5
45	I feel confident that I understand things.	1	2	3	4	5
46	I feel unattractive.	1	2	3	4	5
47	I worry about looking foolish.	1	2	3	4	5

BACKGROUND INFORMATION

In the remaining questions, we would like know a little about your background. This helps us understand how the program affects different people differently.

48 Where are you from? (please circle only one)
   1. San Francisco Bay Area
   2. Northern California, outside Bay Area
   3. Southern / Central California
   4. U.S. but outside California
   5. Outside of the United States

49 What is your sex? (please circle only one)
   1. Female
   2. Male

50 What is your ethnicity?

   I identify my ethnicity as:

   _____.

Post-Semester Survey

1. What was the best part of being an Explainer?

2. What was the worst or most challenging part of being an Explainer?

3. As an Explainer, what do you feel you've learned about teaching people something?

4. What, if anything, have you learned about getting along with other explainers?

5. What, if anything, did you learn about your own process of learning?

6. What skills have you learned that you think will help you in the future?

7. How did you learn the science that you've been explaining?

I learned the science from:	Not at all	A little	A lot
a) Exploratorium staff members in trainings	1	2	3
b) Exploratorium staff members <u>outside</u> trainings	1	2	3
c) Other Explainers	1	2	3
d) Myself (using exhibits, reading, etc.)	1	2	3
e) Others outside the Exploratorium	1	2	3

8. Do you consider yourself someone who particularly likes science? (circle one)
   Yes   No

8a. What, if anything, interests you about science?

8b. What, if anything, turns you off about science?

9. Have your views about science changed during the time you've been an Explainer? (circle one)   **Yes   No**
    If so, what led to that change?

10. If you had Darlene's job, what changes would you make to the Explainer program?

11. What do you like about school?

12. What do you dislike about school?

13. Have your views about school changed during the time you've been an Explainer? If so, what led to that change?

14. Have you made any big decisions recently about your education? (circle one)
    Yes   No

    (FOR EXAMPLE, HAVE YOU DECIDED WHETHER OR NOT TO FINISH HIGH SCHOOL, WHETHER TO GO TO COLLEGE, WHAT SUBJECTS TO STUDY/MAJOR IN, ETC.?)

    If Yes, what was the decision(s) you made?

15. Have you made any big decisions recently about your career? (circle one)
    Yes   No
    (For example, have you decided what kind of work you want to do in the long term, what kind of work you plan to do in the short term, etc.?)

    15a. If Yes, what was the decision(s) you made?

    15b. If you haven't made any decisions about career recently, what do you think you might want to do in terms of a career? (Please put down anything that you are considering.)

16. When you make big decisions, how do you go about deciding? Are there any steps you take?

PLEASE USE THE 5-POINT SCALE TO INDICATE YOUR AGREEMENT OR DISAGREEMENT WITH EACH STATEMENT.

Circle the number that best indicates your response.

		strongly disagree	disagree	neutral	agree	strongly agree
17	I enjoy working at the Exploratorium.	1	2	3	4	5
18	I am interested in science.	1	2	3	4	5
19	I am interested in art, music and/or theatre.	1	2	3	4	5
20	I enjoy working with people.	1	2	3	4	5
21	I plan to graduate from high school.	1	2	3	4	5
22	I plan to go to college.	1	2	3	4	5
23	I feel self-conscious when I'm in a group of people.	1	2	3	4	5
24	I am curious about how things work.	1	2	3	4	5
25	I enjoy teaching people about stuff that I understand.	1	2	3	4	5
26	I have enjoyed getting to know the other Explainers.	1	2	3	4	5
27	I like the academic part of school.	1	2	3	4	5
28	I like the social part of school.	1	2	3	4	5
29	I believe that I can understand science.	1	2	3	4	5
30	I read stuff outside of school that relates to science.	1	2	3	4	5
31	I like to watch TV programs about science topics.	1	2	3	4	5
32	I like spending time with groups of people.	1	2	3	4	5
33	I like playing sports.	1	2	3	4	5
34	I perform well academically in school.	1	2	3	4	5
35	I am interested in political or social issues.	1	2	3	4	5
36	I enjoy reading.	1	2	3	4	5
37	I usually feel confident when taking tests.	1	2	3	4	5
38	I would like to have a career in science.	1	2	3	4	5
39	As an Explainer, I learned science ideas that helped me in high school.	1	2	3	4	5
40	As an Explainer, I learned general skills that helped me in high school.	1	2	3	4	5
41	As an Explainer, I learned skills that I think will help me beyond high school.	1	2	3	4	5

HOW DO YOU SOLVE DIFFICULT PROBLEMS?

For example, suppose you're deciding what to do with your life after high school. There are several options available to you, but none of them is perfect. Think of this situation when responding to the statements below.

When faced with a difficult problem...

		strongly disagree	disagree	neutral	agree	strongly agree
42	I look at several solutions to the problem, and then make a final decision.	1	2	3	4	5
43	I make a final decision without giving much thought to the problem, based on what seems right to me at the time.	1	2	3	4	5
44	I think about different courses of action and then make a final choice.	1	2	3	4	5
45	I think hard about the problem and its possible solutions, and cannot decide what to do.	1	2	3	4	5
46	I come up with a final decision without having checked, or even searched for very many possible solutions.	1	2	3	4	5
47	I give a lot of time and thought to the problem and its possible solutions, make a decision, and change it more than once.	1	2	3	4	5

HOW DO YOU FEEL ABOUT YOURSELF?

		strongly disagree	disagree	neutral	agree	strongly agree
48	I feel confident about my abilities.	1	2	3	4	5
49	I often feel self-conscious.	1	2	3	4	5
50	I feel that I have trouble understanding things that I read.	1	2	3	4	5
51	I feel good about myself.	1	2	3	4	5
52	I feel as smart as others.	1	2	3	4	5
53	I feel concerned about the impression I make.	1	2	3	4	5
54	I am pleased with my appearance.	1	2	3	4	5
55	I worry about what other people think of me.	1	2	3	4	5
56	I feel confident that I understand things.	1	2	3	4	5
57	I feel unattractive.	1	2	3	4	5
58	I worry about looking foolish.	1	2	3	4	5

59 Do you have any other comments about the program or about your experience? If so, please write them in the space below and/or on the back side of this sheet.

Alumni Survey

PLEASE USE THE 5-POINT SCALE TO INDICATE YOUR AGREEMENT OR DISAGREEMENT WITH EACH STATEMENT.

Mark the number that best indicates your response. If the item does not apply to you, please mark N/A (Not Applicable).

		strongly disagree	disagree	neutral	agree	strongly agree	
1	I enjoyed working at the Exploratorium.	1	2	3	4	5	N/A
2	I am interested in science.	1	2	3	4	5	N/A
3	I am interested in art, music and/or theatre.	1	2	3	4	5	N/A
4	I enjoy working with people.	1	2	3	4	5	N/A
5	I plan to graduate / did graduate from high school.	1	2	3	4	5	N/A
6	I plan to graduate / did graduate from college.	1	2	3	4	5	N/A
7	I feel self-conscious when I'm in a group of people.	1	2	3	4	5	N/A
8	I am curious about how things work.	1	2	3	4	5	N/A
9	I enjoy teaching people about stuff that I understand.	1	2	3	4	5	N/A
10	I enjoyed getting to know the other Explainers.	1	2	3	4	5	N/A
11	I don't / didn't like the academic part of school.	1	2	3	4	5	N/A
12	I don't / didn't like the social part of school.	1	2	3	4	5	N/A
13	I believe that I can understand science.	1	2	3	4	5	N/A
14	I don't read stuff outside of school / work that relates to science.	1	2	3	4	5	N/A
15	I like to watch TV programs about science topics.	1	2	3	4	5	N/A
16	I like spending time with groups of people.	1	2	3	4	5	N/A
17	I like playing sports.	1	2	3	4	5	N/A
18	I don't / didn't perform well academically in school.	1	2	3	4	5	N/A
19	I am interested in political or social issues.	1	2	3	4	5	N/A
20	I enjoy reading.	1	2	3	4	5	N/A
21	I usually feel / felt nervous when taking tests.	1	2	3	4	5	N/A
22	I would like to have a career in science.	1	2	3	4	5	N/A
23	As an Explainer, I learned science ideas that have helped me in the past year.	1	2	3	4	5	N/A
24	As an Explainer, I learned general skills that have helped me in the past year.	1	2	3	4	5	N/A
25	As an Explainer, I learned things about getting along with people that have helped me in the past year.	1	2	3	4	5	N/A
26	As an Explainer, I learned decision-making skills that have helped me in the past year.	1	2	3	4	5	N/A

HOW DO YOU FEEL ABOUT YOURSELF?

		strongly disagree	disagree	neutral	agree	strongly agree	
27	I feel confident about my abilities.	1	2	3	4	5	N/A
28	I often feel self-conscious.	1	2	3	4	5	N/A
29	I feel that I have trouble understanding things that I read.	1	2	3	4	5	N/A
30	I feel good about myself.	1	2	3	4	5	N/A
31	I feel as smart as others.	1	2	3	4	5	N/A
32	I feel concerned about the impression I make.	1	2	3	4	5	N/A
33	I am pleased with my appearance.	1	2	3	4	5	N/A
34	I worry about what other people think of me.	1	2	3	4	5	N/A
35	I feel confident that I understand things.	1	2	3	4	5	N/A
36	I feel unattractive.	1	2	3	4	5	N/A
37	I worry about looking foolish.	1	2	3	4	5	N/A

38. How do you spend your time now, in terms of education? (mark **all** that apply)

(a) I'm in high school.
(b) I'm in college. My major is / might be _____.
(c) I'm in graduate school / professional school. My field is _____.
(d) I'm not a student right now, but plan to go back for further education in the future.
(e) I have finished my formal education.
(f) I volunteer for a school or an education-oriented organization.
(f) Other. Please describe:_____.

39. What is the highest academic degree you have obtained at this point in your life?

(a) no degree right now
(b) high school diploma
(c) associate degree
(d) bachelor's degree
(e) graduate degree

40. How do you spend your time now, in terms of work? (mark **all** that apply)

(a) I'm working full time.
(b) I'm working part time.
(c) I'm not working right now by choice.
(d) I'm not working right now, but would like to find work.
(e) Other. Please describe: _____.

41. Are you working in your area of interest? Y /   N   Not working

42. Do you enjoy the work you're doing? Y   /   N   Not working

43. How often do you think about science these days? (please mark below)

		Never	Rarely	Sometimes	Often
(a)	I talk about science with my friends or family.	1	2	3	4
(c)	I use science to explain things in my life.	1	2	3	4
(d)	I watch TV shows or read about science issues.	1	2	3	4
(e)	I take science class(es). Which ones? _____	1	2	3	4
(f)	My work involves science. Briefly describe: _____	1	2	3	4

44. In what year was your first semester of work as an Explainer?

_____

45. How long did you work as an Explainer?

(a) one semester
(b) two semesters
(c) three semesters
(d) four semesters
(e) five semesters
(f) six semesters
(g) over six semesters

46. What is your gender?

(a) male
(b) female

47. What is your age?

(a) under 18
(b) 18-21
(c) 22-25
(d) 26-29
(e) 30-35
(f) over 35

48. [OPTIONAL] Which of the following categories most closely describes your ethnicity? You may mark more than one choice.

(a) African-American
(b) Asian-American / Pacific Islander
(c) Caucasian
(d) Hispanic / Latino
(e) Native American
(f) Other _____

49. Is there anything that you learned or experienced while you were in the Explainer program that you feel is valuable to you now, in your current life? If so, what is it and why is it valuable to you now? If not, why do you think that is? [You may attach additional pages if you like.]

50. If you have any other thoughts / feelings / comments about the Explainer program and your participation in it that you would like us to know, please tell us here. [You may attach additional pages if you like.]