

INTERACTIVE EVENTS RELATED TO THE LATEST RESEARCH ACHIEVEMENTS: CLOSING THE GAP BETWEEN SCIENCE ADVANCEMENTS AND THE PUBLIC

Fuji Nagami

Japan Science and Technology Agency (JST), National Museum of Emerging Science and Innovation
(Miraikan)

Abstract

The National Museum of Emerging Science and Innovation (Miraikan), Japan, has developed the program, “Live Talk: Science Edge”, related to the latest research achievements, featuring the most recent research articles published. We select a “Hot Paper” from scientific journals and invite the first author as a guest of the event. First authors of research articles are normally doctoral students or post doctoral fellows and they can tell related realistic processes of the study, like experimental procedures. The results of the program show that the general public sometimes cannot understand the research results themselves, but are interested in the research process. Here we report on the effectiveness of direct communication between researchers and the general public using the “hot paper” as a basis for the cultivation of interests in science itself.

Keywords: Talk event, the Latest research, the first author, direct communication

1. Introduction and Background

Nowadays, more scientific research articles are produced in various fields of studies than ever before. These emerging sciences have the potential to directly change people’s everyday lives, and the latest research achievements are highlighted through mass media such as television and newspapers. Mass media tends to treat scientific results from the view point of the impact of application, not from those of a scientific perspective or from the attractiveness of the study itself. Public images of the emerging sciences have been shaped by these of mass media reports. Traditional science museums have no role in this process as they have been focused on the education of established science knowledge and cannot treat the new research results.



Figure 1 National Museum of Emerging Science and Innovation, Japan (Miraikan)

The National Museum of Emerging Science and Innovation (Miraikan) opened in 2001 and focuses on cutting edge research of modern sciences [1]. Permanent exhibit are divided mainly into four themes, “the earth environments and frontiers”, “innovation and the future”, “information science and technology for society”, and “life science”. To keep the exhibits on the cutting edge, we upgrade them quite often because the advancement of science is very fast.

But hundreds of scientific research articles are being produced everyday. How can we communicate to people the hot topics at the science museum, and what is the museum’s advantage? To answer these questions, we, Miraikan, developed the program “Live Talk: Science Edge”, related to the latest research achievements, featuring the most recent research articles.

2. Methods and Procedures

2.1 Event Outline

Concept

Words representing the most important concepts of the event are “hot, fast, and young”.

The theme of the event “Live Talk: Science Edge” should be scientifically timely and be topical. We choose an article from the research institutes’ press releases.

The event is held immediately following the publishing of the article, normally in two months. The topic is reported in newspapers and people are aware of them.

We choose as guest speaker the first author of the article. First authors of scientific articles are normally doctoral students or post-doctoral fellows, so they are usually in their late 20s or early 30s. We have the internal regulation for selecting guests for the events under 35 years old. That is our policy.

Target Population

Science museums are thought to be destinations for families with small children on Sundays, in Japan. Our event takes a new approach, and our main targets are: (1) late teenagers or university students who are willing to be research scientists, (2) late 20s or early 30s people who are working in fields other than science. These people normally take science museums lightly. But through the events, we believe we can provide the “role models” for target 1 people, and encourage or stimulation for target 2 people by showing successes of those in the same generation.

Schedule

We plan approximately 5 events per year. Because the events are held on the basis of the research article publication, we cannot make an exact advance schedule.

Logistics

The event is 1 hour-long, with 35 participants, in a dialogue-style. PC presentation is used.

First, the host (organizer) explains the concept of the event, and introduces the guest. A dialogue is started with the instruction on the research article. Usually we use the journal with the paper itself. Most participants are not familiar with scientific research papers, and to touch a real-journal can be a good opportunity for a realistic image how a scientist works.

Second, a brief dialogue is continued on the research itself. Basically, the coordinator asks questions and the guest answers, and then the host sometimes summarizes the scientist’s talk, and explains the technical terms. The dialogue basically follows the scientist’s experimental procedure (chronologically), with slide shows of the experimental facilities or equipment, not only the results. These increase the participants’ attention.

Third, right after the dialogue on the main results of the study, we turn to the “philosophy” of the guest, the reason why he/she choose the topic of the study, or the grand perspectives of the field of the study.

Finally, we arrange ample time for free discussion involving the participants. Discussion from participants is very active and scientifically at a high level. Many guests described the discussion in the “Live Talk: Science Edge” was quite similar to an international congress.

2.2 Procedures

The role of the organizer of this event is full of responsibilities, notably we must be always aware on the press releases from institutions or universities, and news reports on cutting edge sciences. Concrete tasks start right after notice of the topic designated for the event.

First, we check the source of the press release or news. Only peer-reviewed papers are considered, and verbal presentations in academic conferences are omitted. We collect as much information on the study as possible from the internet, including the original paper. From this information, we examine the quality of the study, the age of the first author, the impact of the study, etc. This process should take a day or two.

Second, we contact the guest candidate usually via email. For the candidates, our email is normally the first request ever received for public speaking. We explain the concept of the event very precisely. If the guest candidate is willing to accept our proposal (usually yes, in most cases), we take an appointment within a week or 10 days.

Third, we decide the title, schedule, flow of the event and collect the presentation materials. The important feature of our “Live Talk: Science Edge” is that the initiative for making presentation materials or deciding title is from the museum side.

Finally, we make presentation materials and a dialogue scenario and send them to the guest via email, to ensure an effective event. The process is very useful for the guest scientist, who is young and inexperienced in communication with general public on research topics.

3. Results

3.1 Facts

The series event “Live Talk: Science Edge” was held 7 times from November 2004 to December 2005.

Events

1. Title: “Right away? Future? -The process that “I” decide”

Guest: Saori Tanaka (Female, Graduate student)

- Date: 2004.11.27
2. Title: “The new discovery on the life clock –the sleepless molecules in sleeping cells”
 Guest: Jun Tomita (Male, Graduate student)
 Date: 2005.2.11
3. Title: “The unexpected remembrance between 12.7 billion years ago and now: the farthest galaxy cluster by the Subaru telescope”
 Guest: Masami Ohuchi (Male, Postdoctoral fellow)
 Date: 2005.3.27
4. Title: “Block-in the light in the nanostructure –Strongly, but gently”
 Guest: Song Bong-Shik (Male, Postdoctoral fellow)
 Date: 2005.5.15
5. Title: “Melting iron is bickering deep under the ground –The geomagnetic reversal is reproduced on the Earth Simulator.”
 Guest: Futoshi Takahashi (Male, Postdoctoral fellow)
 Date: 2005.9.19
6. Title: “Connect without fault –The process that the life decode the genetic codes”
 Guest: Ryuya Fukunaga (Male, Graduate student)
 Date: 2005.11.20
7. Title “The secret in the tears of males –Seeking the non-volatile pheromones”
 Guest: Hiroko Kimoto (Female, Postdoctoral fellow)
 Date: 2005.12.7



Figure 2 “Live Talk: Science Edge”

Guests and research articles

We had 7 guest speakers aged from 26 to 32 years old, (28.7 average), 3 doctoral students and 4 are postdoctoral fellows. Most laboratories in natural sciences have their own web pages, and “member pages” are included. After we select a candidate research article, we can check the status of the first author. In our policy, we do not choose a guest on a tenure track.

Table 1 Guests and topics attributes

	Date	The month paper issued	The Journal that the paper appeared	The sex of the guest	The age of the guest	Graduate student(G) / Postdoctoral	Field
1	2004.11.27	2004.8	Nat. Neurosci.	Female	28	G	Life science
2	2005.2.11	2005.1	Science	Male	30	G	Life science
3	2005.3.27	2005.2	ApJ Letter	Male	28	P	Astronomy
4	2005.5.15	2005.3	Nat. Materials	Male	32	P	Materials
5	2005.9.19	2005.7	Science	Male	29	P	Geology
6	2005.11.20	2005.10	Nat. Struc.Mol.Biol.	Male	26	G	Life science
7	2005.12.7	2005.10	Nature	Female	28	P	Life science
Total	-	-	-	F 2 / M 5	Ave. 28.7	G 3 / P 4	

3.2 Questionnaires

At every event we provided and collected questionnaires from participants. From these, we acquired participants' evaluations of the event.

Participants

We had 219 participants in total, aged from mid teenager to 70s. Our important target is the same generation as guest speakers, so the high ratio of 20s and 30s in the participants shows a degree of success with the strategy.

Table 2 Participants

	Number of participants	Number of questionnaires collected	Age						Sex			Museum Experience		
			<20	20s & 30s	40s & 50s	60s & over	Not described (ND)	% of 20s & 30s (ND omitted)	Male	Female	Not described (ND)	The first time	2 nd time	3<
1	35	25	0	16	3	2	14	76	21	11	3	4	2	13
2	28	28	1	12	5	3	7	57	14	8	6	12	2	12
3	35	24	0	8	5	2	9	53	8	9	7	13	2	9
4	28	22	2	4	5	0	11	36	13	1	8	9	3	10
5	35	31	0	6	4	3	18	46	14	7	10	6	2	22
6	30	25	1	8	2	3	11	57	5	9	11	8	4	11
7	28	19	0	6	3	3	7	50	7	7	5	5	2	12
Total	219	184	4	60	27	16	77	56	82	52	50	57	17	89

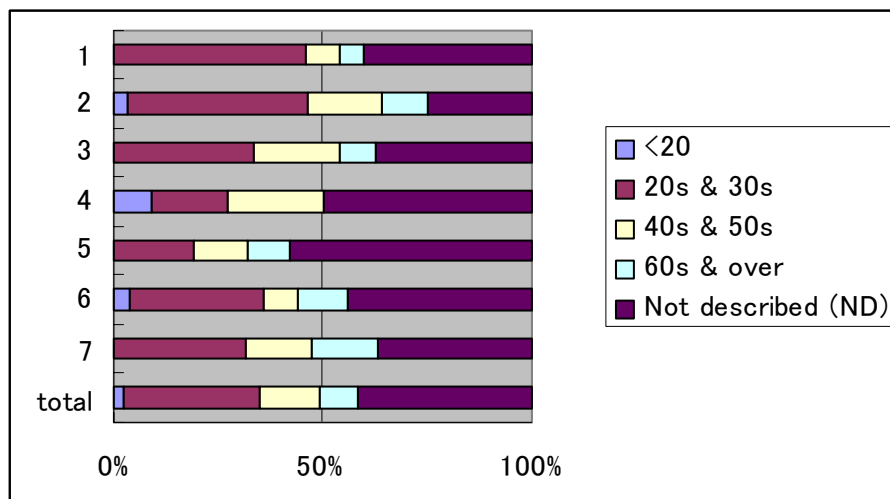


Figure 3 participants age constitution

Participants' evaluations

The evaluations for the events were done by 3-choices select questions, focused on the total impression for the event, the topic attraction, and understandability. The remarkable result is the relatively high ratio of the answer "difficult" for the question on understandability. People can feel interested or good about science topics or events despite having difficulties with understanding.

Table 4 Evaluation from Participants

	total impression			topic attraction			understandability		
	Good	Neutral	Bad	Interesting	Neutral	Boring	Easy	Neutral	Difficult
1	22	1	0	20	3	0	12	9	1
2	22	4	0	24	2	0	15	5	6
3	20	2	0	21	2	0	16	5	2
4	16	2	2	15	2	1	8	6	5
5	19	8	0	21	6	0	10	8	9
6	17	5	0	14	8	0	7	9	6

7	14	2	0	14	1	0	11	2	2
Total	130	24	2	129	24	1	79	44	31

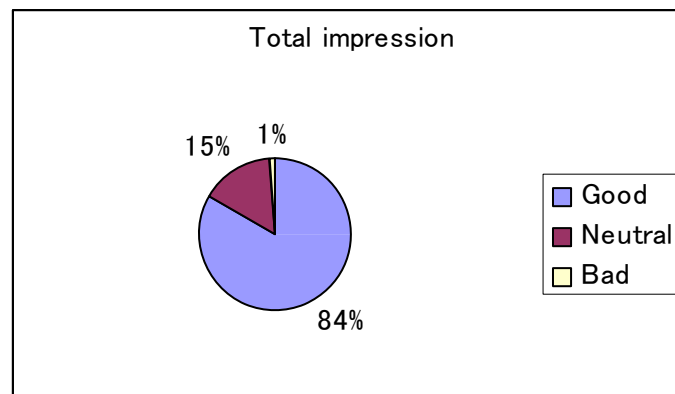


Figure 4 Total impressions for the event

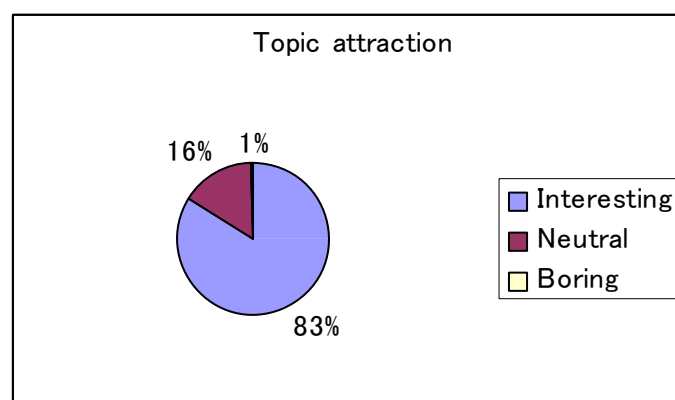


Figure 5 Topic attraction

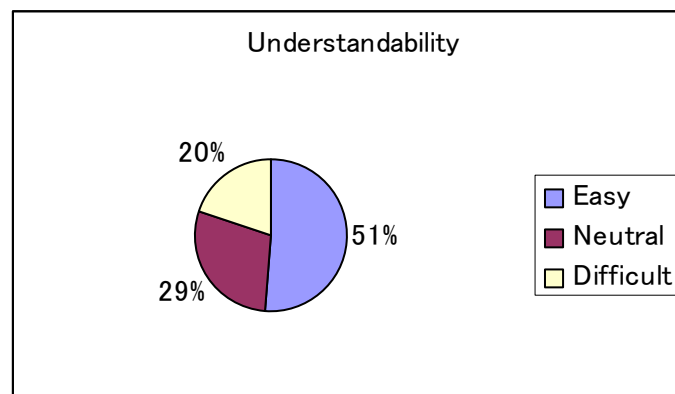


Figure 6 Understandability

Excerpts from free description

- Number of participants are adequate to communicate with a researcher.
- Additional explanation by the museum staff is quite useful to understand.
- Dialogue style is quite attractive.
- Discussion with participants were incredibly active.

3.3 Other Feedbacks

We also maintain close contact with the guest speakers also after the event. All said that the event was a very precious experience. Some said that the discussion with the participants created a scientific idea for his/her study. Most guest speakers had the difficulties explaining his/her study to his/her family or old friends before the event, but they said that our web page or the publicity from the event became good tools in assisting their future explanations.

4. Discussion

When I proposed the idea “Live Talk: Science Edge”, the common response from colleagues of the museum was “Who will attend?” A topic focused on a single paper does not seem to attract people’s attention. Yet, the results of the 7 trials countered those concerns. The event had very little publicities but the number of participants for the events stayed or increased. We had around 35% new comers for each event. The cutting edge sciences can attract people’s attention.

We think a cause of our success depends on the topic selection, the guest speakers, and the style of the event. Topics covered by newspapers or TV only a few months before are attractive to the general public. We took notice of the ratio of the 20 and 30 years old. The figure is significantly higher than that of other events in our museum. For a scientific event, the guest speakers for the “Live Talk: Science Edge” are extraordinary young, and this feature can also attract the people’s attention. Plus, the unique dialogue style of the event is another, well-liked feature. Young scientists have not much training in talking to the public on science, and their experiences and knowledge are limited to their own fields of studies. By applying the dialogue style, the professional communicator can help both the participants’ understanding and the guest speakers’ communication abilities.

A point we must attend to is that we should temper concerns about to “participants’ understanding”. The interesting results of our questionnaires show that the participants’ satisfaction or total evaluation for the event does not always correspond to understandability. Many people answered that the event was difficult, yet interesting and informing. They paid more attention on who did the study than what he/she did. To imagine a realistic process of the experiment is very effective.

The event’s merits extend not only to the participants or museums, but also to the guest scientists. We only had 7 trials, but all guest speakers answered that the event was an exceptional experience. For young scientists under 35 years old, the chance to talk in public is quite rare. We think we provided a positive social communication opportunity for them. It also helps to improve the presentation abilities or to facilitate the interest in public communication.

Some scientists who are my acquaintances said that to be the guest of the “Live Talk: Science Edge” can be a good for young scientists, can stimulate the motivation of young scientists and therefore a good quality communication activity can provide mutual benefits for science and society.

5. Conclusion

We showed successful science communication experiences featuring cutting-edge research. People can be interested even though he/she could not understand the topic. Thus, the communication can be realized with challenging scientific articles, and the success of the communication not only closes the gap between the advancing science and the public, but facilitates the advancement of the study itself.

6. References

[1] http://www.miraikan.jst.go.jp/index_e.html