

GSEE/Kyoto: Reports of Working Groups and Discussion of Different Steps

(Summary)

Date: 23 Oct 2013

Place: Westin Hotel Miyako, Kyoto, Japan, Minori no Ma 4F

Participant List

Chair:

Patricia Sievert

WG1 Presentation:

Martin Storksdieck

WG2 Presentation:

Akito Arima

Participants:

Kazuo Nishimura

Jean S. Chung

Hong Ding

Tai Kai Ng

Michiharu Nakamura

Daniel Rouan

Terufumi Ohno

Michiko Ogawa

Tetsuo Hosoya

Ali Alpar

Philip Hammer

David Pines

Jenny Ye

Chun-Yeol You

Participant List

Katsuji Koyama

Kazuyoshi Yoshimura

Masatoshi Murase

I. Introduction (Patricia Sievert)

Mrs. Patricia Sievert introduced Mr. Martin Storksdieck, who introduced the Working Group 1 discussion.

II. Working Group 1 (Martin Storksdieck)

Mr. Storksdieck first discussed distributing the materials based on the discussion of the working groups, and also what the practical next steps would be for GSEE, based on the above materials.

One thing that the participants noticed was that the grand challenges written on the white paper were recognized as challenges on a global scale, and ideas needed to be more concrete. Of these challenges, the most pertinent was to create a vision, stating GSEE's objectives. Mr. Storksdieck also focused on the challenges that currently exist on the present day, such as connecting scientists and engage them with each other, creating bridges between them and help each other contribute to science and their communities.

Another question was who exactly the scientists are, who are engaged. When it comes to science education, it is essential to include younger role models who are on their way to becoming scientists, and also engaging with younger schoolchildren, as means of outreach. What is important is the idea to encourage, support, and foster the education of emerging scientists to engage with young people, and give them the support they need for their career. Senior researchers must be willing to have their assistants, relying on their graduate students and advanced undergraduates. Another route of support can come from alumni, who can offer pertinent advice to current students. These figures certainly could be famous, but local figures and recent graduates can also add relevancy to these initiatives.

Another initiative is to promote science history, such as researching famous figures and stories about science and scientific discoveries. Training and outreach for university students is also essential, to keep students interested in science.

The second grand challenge is how scientists can connect globally and regionally, and the third was how to bridge globally. A suggested fourth grand challenge as a component of the first, was how to involve younger generations in science.

Upon discussing the idea of the journal, it was reaffirmed by all that it is certainly important to do, but no specific concrete initiatives. One idea proposed was that a journal could help scientists link up with each other, with scientists who have an idea to experiment with and other scientists who can provide empirical evidence. Different models for how such a journal could exist were suggested. The idea of integrating the various disciplines was an important suggestion, in order for younger generations to see science as a method of solving social problems.

Mr. Ali Alpar continued Mr. Storksdieck's commentary by underlining a few things. First was a unifying view on consensus and the scientific method, and one way to do

so was to use the history of science. Another issue that came forth was issues in particular national context, and the group discussed similarities and differences between these, such as entrance exams.

Mr. Storksdieck brought up another point, that maybe it is useful to bring research scientists and educators together to create an inventory of scientific ideas and concepts, in such a way that students can understand the issues before they are expected to grasp ideas mathematically. Such a concept has been pioneered in some parts of the United States, in order for students to fully grasp the concepts.

Mr. Hammer introduced the American Institute of Physics website, to elaborate upon the history of science, and introduced the idea of web exhibits, such as those exploring famous scientists as Ernest Rutherford and Marie Curie. This has the effect of humanizing science, introducing those who made pivotal discoveries.

III. Working Group 2 (Akito Arima, Patricia Sievert)

Emphasis was placed on encouraging young researchers to get involved, provide mechanisms for them to be respected and have methods of furthering careers, instead of hindering them.

Mr. Arima said that they will start to have a Board of Governors, one in Kyoto and one in Tokyo. However, the most important problem in Japan is how to organize different communities, in physics, chemistry, and biology, as each is quite independent; to try and unite in a common goal of encouraging students to study science. Mr. Kitahara will pursue this initiative. Mr. Arima has one group, the science teachers of junior high schools, who are very well organized in a similar way to an NPO. In Japan, the most powerful influence on education is the parents, not teachers, and so he suggested parent-teacher associations (PTA) as a way to educate students in science. These PTAs are mostly concerned with moral education, not science, so it is crucial to demonstrate the importance of science education to them.

Mr. Arima said that Taipei, Hong Kong, and Beijing will certainly support such initiatives, but as there was no Korean opinion in the group, he asked Mr. Chon-Yeol You for his. Mr. You responded that there is a similar problem in Korea, and said that he will talk about this issue among Korean scientists and researchers. He believed that the teachers at each level of education must also be involved in such discussions.

Mrs. Sievert commented that there are many statistics that indicate that students with a strong math and science background end up making more money over their career, which may be a powerful motivating tool for PTAs.

IV. Open Discussion

The idea of 'Head-Start Science' was brought up, working with nursery school teachers and behavioral science researchers, to study how young children learn the

sciences and why natural curiosity declines by age 5. Mr. Storksdieck elaborated upon this, and suggested that perhaps because children begin to speak and ask questions, when teachers and parents cannot give an answer, children become disinterested. He suggested beginning thinking differently about how to approach a child's questions, so as to continue encouraging their creativity and curiosity. Research shows that young children ask upwards of 300 questions a day, so this is a very important issue. Mr. Jean S. Chung stated that it is important to reach the parents on this issue, and Mr. Storksdieck replied that it might be better to frame the issue as not a matter of science, but of parenting. Mrs. Sievert continued upon this, and stated that it is necessary to find out how universities have been progressing in this area.

Mr. Ohno suggested a learning course with parents and children together, bringing interest in science in the parents and also supporting the curiosity of children, motivating them to be interested in these issues. Mr. Kitahara also commented that parent outreach is very important, and stressed that science should not be about knowing the correct answer, but exploration and curiosity itself. Mr. Pines asked early education experts about the sorts of questions a young child is really going to ask, and based on those results, explore what can be done at the nursery school and at home to find answers to the questions they will ask. Mr. Hammer agreed that most questions can be anticipated, but that another important method is to work with teachers to develop ways for children to answer questions with experiments.

Mr. Alpar stated that in addition to creating these sorts of early education programs, the issue of promoting these programs. He suggested that the group work on promoting these programs, particularly in regards to learning issues.

Mr. Storksdieck brought the discussion around to incentive structures about science, and asked what the role is GSEE can play to encourage scientists to engage outside of their research. He noted that there is already such an initiative to educate researchers to be better teachers, but asked what GSEE is doing to encourage both this, and what GSEE is doing to deepen outreach in younger scientists. He admitted that many senior researchers do not see this as a pressing issue, and Mr. Hammer agreed. He stressed that support from particularly respected figures in the field to promote these ideas will validate their activities, not just nationally but globally. Mrs. Sievert agreed that the most powerful thing GSEE could do is to facilitate such a cultural shift.

Mr. Storksdieck asked if they will not just revise the white papers, but if they will make a statement on the importance of supporting science education. Mr. Arima asked how media will affect their statements. He noted that in Japan, the Tohoku earthquake and the ongoing Fukushima crisis have shaken confidence in science, and there is less trust in science in Japan as a whole. Mr. Storksdieck concurred and stated that similar opinions were prominent in Germany. Mr. Nakamura continued upon this, and mentioned their efforts in encouraging Japanese Nobel laureates to be more active. In regards to nuclear power, Mr. Nakamura stressed that scientific discussion is still needed in Japan, and stated that he will organize a working group to build that discussion.

Mr. Kitamura explained that they are gradually establishing several dialogue meetings in regard to how scientific literacy. Mr. Storksdieck followed, saying that the National Academy of Science is sometimes rather naïve in how it makes statements, creating

impressions that many problems are framed as scientific problems, which suggests the fallacy that science itself is the problem. He tied the issue back to GSEE, and emphasized how it is important to emphasize the limitations of science, the scientific process, and how what the public sees is the result of science and not the science itself. Mr. Pines added to the issue, and stressed that science was not at fault, but human behavior. He also stated that it is not just Japan that deals with this issue, but for example cited the Affordable Care Act in the United States, and how behavioral issues created problems there as well.

Mr. Nishimura said, speaking as an economist, that the number of supporters outside each discipline is important. Mr. Ohno commented on the hierarchy of the STEM fields in Japan and how each branch of science is viewed. Mr. Pines offered some closing comments, first thanking Mr. Nishimura and Mr. Arima, the co-organizers of the summit and for their time spent in preparation.

The discussion concluded at 11:55 A.M.