

## **Development of Public Understanding of Science and Technology (PUST) in Japan Science and Technology Agency (JST)**

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### **Abstract**

Japan Science and Technology Agency (JST) is responsible for the strategic activities of PUST based on the Science and Technology Basic Plan. PUST activities will be introduced as a development of JST since the year 1996. First of all, TV broadcasting and National Museum of Emerging Science And Innovation (Miraikan) were established to transmit the information and knowledge of science and technology to the whole country. Then, as assistance for science education, digital learning contents were developed and distributed, and Super Science High Schools (SSH) were promoted. Further under the 3rd Science and Technology Basic Plan, activities to train scientific human resources and promote Science Communications will be developed.

### **Index Terms**

JST, PUST, , digital learning contents, Super Science High Schools, Science Communications

### **Introduction**

Public Understanding of Science and Technology (PUST) encouraged by Science and Technology Agency (STA. STA became Ministry of Education, Culture, Sports, Science and Technology (MEXT) with Ministry of Education, Culture and Sports in 2001.) was started as more strategic activities than conventional exhibitions at science center according to the 1st Science and Technology Basic Plan initiated in 1996. Japan Science and Technology Agency (JST) is the main organization responsible for these strategic activities, and has developed various projects since 1996. The 3rd Science and Technology Basic Plan will be started in 2006, in which the role of PUST will expand steadily, and the role of JST will also become more critical. Here, by introducing the development and initiatives of PUST by JST, the role of PUST in Japan will be described.

### **Development of Public Understanding of Science and Technology**

1) JST started the PUST in 1996, and 10 years have passed now. However, there are very few activities being continued for 10 years (Fig. 1). Main reason lies in the fact that the PUST projects by JST aim to develop advanced and strategic models so that such models might be utilized at science centers, schools, companies and so on. Various activities are under way in an attempt to achieve effective results by the development of models.

Activities	FY1996	FY1997	FY1998	FY1999	FY2000	FY2001	FY2002	FY2003	FY2004	FY2005
Supporting of International Science and Technology Contest										
Innovative Digital Learning Contents for Study of Science and Technology										
Super Science High School										
Model Region for Science Literacy of Elementary and Junior High School										
Promoting Voluntary Teaching at the Region										
Supporting of Glass Roots Activities										
Science Camp										
Program for Cooperative Developments of Community Science Centers and Schools										
Development of Exhibition (Idea Contest)										
Preparing Multi-Media Program for Science Museum										
Supporting of International Robot Contest										
Directory Database of Science Centers in Japan										
JST Science Lecture										
Collaborated Event of Science Lecture and Music Concert										
Supporting of Researchers' PUR Activities										
Science Channel										
JST Virtual Science Center										
National Museum of Emerging Science and Innovation (Miraikan)										

Fig.1 Chronology of JST PUST

2) In years 1996 through 2000 corresponding to the 1st Science and Technology Basic Plan, efforts were made to transmit and distribute the information and knowledge related to science and technologies. As a method, TV and science centers were utilized, and the following projects were attempted specifically.

Virtual Science Center (Web contents provided by Internet) and Science Channel (TV station for scientific programs) were established, which transmit the information of science and technology efficiently to the whole country. In order to encourage the activities of science centers, idea contest for exhibitions and IT functions of science centers were promoted. The voluntary activities mainly carried out by science centers were encouraged. For the first time, activities as science center were started in 2001, but the biggest project was the construction of National Museum of Emerging Science And Innovation (Miraikan).

3) Science Channel will be introduced. Science channel is designated to specialty TV station the science programs, these programs are provided by satellite broadcasting, cable TV and Internet. At present, Science Channel mainly provides programs by cable TV for 5 hours per day, about 8 million families can watch the programs by these media. About 300 titles have been produced annually in Science Channel, and some of titles were awarded prizes at overseas picture festivals (“The Sleeping Cat - a Journey Through the World of Shapes -” was

received Gold Dragon in section of Science for Youth and Education Film at 2004 Beijing International Science Film Festival).

4) National Museum of Emerging Science And Innovation (Miraikan) is a science center opened publicly in 2001 for the purpose of transmitting the advanced science and technologies in easy-to-understand ways. Exhibitions are mainly consisted of the four themes such as “The Earth Environment and Frontiers,” “Innovation and the Future,” “Information Science and Technology for Society” and “Life Science”, Miraikan attract 600 thousands visitors or so annually.

Commentators for exhibitions called “Interpreter” are placed to easily describe the advanced science and technologies, and specialists provide experiment shows for visitors. Laboratory of cutting-edged science research group belonging to JST is annexed Miraikan, researchers can provide opportunities for visitors to tour around the laboratory.

“Transmitting things in easy-to-understand ways” is equivalent to the establishment of good communications between science and people.

5) In years 2001 through 2005 corresponding to the 2nd Science and Technology Basic Plan, most attracting items are support activities for science education, especially the development and distribution of the digital learning and Super Science High Schools.

In the support of science centers, cooperation with schools is more important, and activities are re-constructed. Also, in order to enhance the people’s interest in science and technology, information transmission from researchers’ communities will be promoted.

6) Digital learning contents for science education in classroom are publicly opened via Internet to teachers at primary schools through high schools, and about 12 thousands users are registered at present. Various devices and protecting copyrights are provided so that learning digital contents can be used, in which the introduction of the most advanced science to enhance interest of science is included. Teaching in classroom and the students’ studies using the digital learning contents are practiced.

7) Super Science High School (SSH) is a school which practice science and mathematics education intensifying programs by the support. Most of SSH are selected by public high schools. For the purpose of training superior scientific human resources, 82 schools as SSH are selected currently.

As an intensifying program, SSH is practiced to prepare experiment equipments and experiment, conduct teaching in classroom cooperating with universities and research institutes, do the field work, visit around research institutes and science centers, and intensify the capability of presentation in English for international opportunities. And, SSH is the 5-year limited program. Practices are uniquely prepared and conducted according to the conditions at each school.

8) Support is given to regional science centers by selecting the plans considering the cooperation with schools. In the plans, science centers get obvious achievements in the exhibitions and field work through the participation of schools.

## Development in the Future

1) PUST activities by JST have contributed to shift the focus to the support of science education from the provision of science information to people in easy-to-understand ways (Fig. 2). New activities have also been started, and the 3rd Science and Technology Basic Plan will be prepared next year. So, now under consideration, the new development of activities will be introduced.

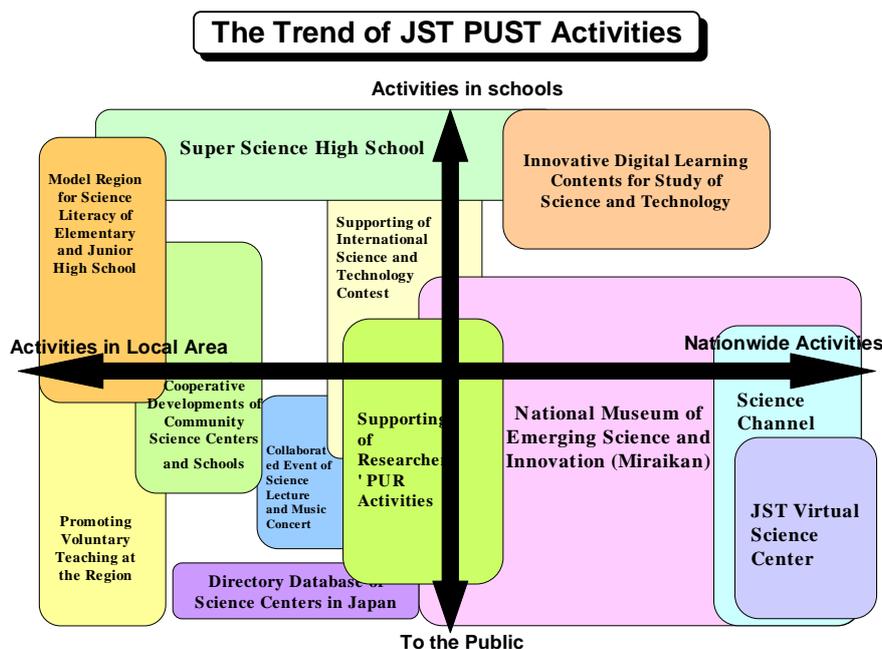


Fig.2 Trend of JST PUST Activities

2) First of all, one of the items is how to intensify the support of science education for the purpose of training the scientific human resources. One of the ways is to support the joint activities to intensify science education by the group of 10 to 20 primary and junior high schools and the local educational facilities.

JST encourage science education through the fund and communications for joint activities. In the execution of such activities, critical points are the positive activities by school teachers and the assistance by local activity supporting groups.

3) JST attempts to support the information transmission from researchers' communities. JST support researchers to study the system of transmission from researchers' communities, and establish mechanisms by which to arbitrate the relations between researchers and people.

Japanese universities have made very small effort to study science communications. Since, however, it is essential in the future to announce research contents to the public for science and technology researches, and several universities will create chairs of science communications. Also in the researchers' communities, time has come when some result of researching science communications is requested.

Specific result of researches is to be seen, and the mechanism of arbitration is to be

established. However, some good communication between researchers and people is essential in the science and technology in the future.

### **Conclusion**

The PUST are being developed in JST based on Science and Technology Basic Plan. It has been encouraged to distribute the knowledge of science and technology, try new scientific education and establish cooperation between schools and regional facilities of science and technology. These attempts enhance the interest of students in science and affect their courses to take such as by their participating in a variety of experiments, visiting around the science centers and participating in the researches at universities (“Survey on Willingness to Learn Science (Temporary Translation)” by Yasushi Ogura: National Institute for Educational Policy Research (NIER)). In the 3rd Science and Technology Basic Plan, important viewpoints will be the training of scientific human resources and the science communications between scientists and people. Several activities have already been started from these points of view.

By presenting these models obtained from the achievements in the activity sites, JST hopes that schools and regional organizations take actions as practicable attempts in wider areas. JST must continue to challenge in new activities for such purposes.

### Reference

JST PUST URL <http://www.jst.go.jp/rikai/index.html> (Japanese only)

NIER URL (Reference document) <http://www.nier.go.jp/ogura/tokutei.html> (Japanese only)