

Virtual Science Museums of China: A Successful Practice of Internet-based Science Communication

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Abstract:

With the spread of Internet and people's increasing trust on the Internet, IT-based science communication embraces new challenge and opportunity. The science community serves as the information source; while the practitioners of IT-based science communication serves as the core force to process raw data creatively as well as the collaborator to encourage other participant forces and promote the efficiency of the whole.

Science would serve the Society better when more common people could understand, appreciate and raise doubts on Science. In IT-based science communication, various measures should be taken to communicate the knowledge, method, procedure and responsibility of Science, promoting the exchange and mutual understanding between Science Community and the Public.

Key Words:

Science communication, Internet, Science communication community, public understanding of science, Virtual Science Museums of China

Part One: Introduction

Sir Francis Bacon once said, that the power of knowledge is not only determined by its value, but also by the depth and width of its dissemination. As one of the most important information sources for science communication, scientists and science institutes play important roles in the procedure of science communication. In 2000, President Zhou Guangzhao of China Association for Science and Technology spoke on the International Science Popularization Forum, "As the major force of science popularization, Science Community should take the responsibility to promote public understanding of science."¹ The Law of Science Popularization of China says, "Institutes of science and technology, schools and universities, social bodies of natural sciences and social sciences, should organize and support scientists and teachers to do science popularization relevant to their specialties."²

In today's information society, science communication could not just depend on the duty and responsibility of the science community when the division of science subjects and social labor becomes more and more specialized. Scientists serve as the discoverer of science information and could only do some part-time job on science communication. The progress of society and people requires betterment of science communication in content and form, and calls for a professional team to process all kinds of science information creatively.

Along with challenge, the information society also brings new technology and opportunities. "Technology of communication has grown fast since 1970s...when new technologies like the computer and network are broadly applied in science communication...modern science communication becomes broader, more prompt and convenient."³ According to *China's Report on the Development of Internet*, the number of Internet users in China has reached 94 million by the end of 2004⁴...88.3% Internet users and 85.6% among those who don't use Internet agree that Internet could increase the efficiency of work, study and life.⁵ Internet-based science communication becomes a trend of the information era.

Chinese Academy of Sciences (CAS) is a leading academic institution with more than 100 institutes and over 40,000 researchers in natural sciences, technological sciences and high-tech innovation. CAS has accumulated a large number of data and conducts advanced research in China. Depending on the advantages of operating the China Science and Technology Network and providing service on scientific information and super-computing, the Computer Network Information Center (CNIC) under CAS initiated Virtual Science Museums of China (VSMC, www.kepu.net.cn). Based on the authoritative information provided by CAS Institutes, as well as the advanced IT technology of CNIC; VSMC is dedicated to release knowledge, method, procedure and responsibility to the public, and to promote the communication between science community and the public.

Part Two: Procedure of Science Communication

1 Pattern of Science Communication

The education specialist raised a one-way pattern for science communication as,

Producer of Science Information → Information One → Science Communication Practitioners → Information Two → Ways of Communication → Receiver⁶

In the VSMC System for science communication, a professional information service team serves as full-time “science communication practitioners”, who need to discover and inspire the potentiality of different scientists and science institutes in science communication. As “Producer of Science Information”, Scientists dominate the framework design of VSMC and input knowledge and thinking methods (Information One). The information service team then works creatively to produce Information Two by thinking independently and talking with sources of the science information. Internet users could get access to Information Two via the main website in Beijing and other mirror sites in Lanzhou, Nanjing, Taipei, North America and Korea. Compact discs with the contents of VSMC reach out to remote rural areas in China like Tibet and Ningxia Province. In August 2004, CNIC initiated the idea of establishing the Federation of Internet-based Public Science Education of CAS (FIPSE). FIPSE counts 79 CAS institutes at the very beginning, with VSMC as one of the forces at the core. The emergence of FIPSE benefits the share of information in science communication and promotes effective communication among all the participants.

Yet a one-way pattern for science communication is insufficient. In order to provide better service for the public, practitioners of science communication need to continuously improve Information Two by receiving and analyzing feedback information from the public. Meanwhile, “As a social force concerned about the function of science to the society, Public should have chance to participant in science and understand the influence, power and function of science...It’s necessary to promote the communication between scientists and the public, and emphasize the social responsibility of scientists in science research.”⁷ Therefore, VSMC follows a both-way pattern in the practice of science communication,

(Add a Picture)

VSMC makes some tentative efforts to establish bridges between the science community, the science communication community and the public.

A Collaborate with U.S. education specialists on curriculum design, guiding Internet users in studying systematically based on the virtual museums and filling in the surveys; practitioners of science communication collect and analyze data and make suggestions on improving the virtual museums and curriculum.

<http://survey.sdb.ac.cn/surveyHTML/1101455613207.htm>

B Establish the BBS as platform for the public to communicate with the science community and practitioners of science communication

<http://forum.kepu.net.cn/bbsxp/index.asp>

C Organize regular face-to-face activities for the public to communicate with the science community and practitioners of science communication

<http://www.kepu.net.cn/gb/notice/xly04/index.html>

D Think about needs of the users and encourage them to submit feedback and suggestions in designing each module of the virtual museums

<http://www.kepu.net.cn/gb/lives/giantpanda/pandacam/diary/index.html>

E Make live broadcast on big science events, promote the public understanding on social responsibilities of science research and science communication

<http://www.kepu.net.cn/gb/notice/ntc20050328.html>

F Provide videos and explanations of lectures by famous scientists

<http://www.kepu.net.cn/gb/scientist/index.html>

2 Creative applications of network and information technology for promoting Public Understanding of Science

The Public Understanding of Science, Report of Dr. W.F. Bodmer raises a new opinion in 1980s; that the concept of Understanding includes the understanding of science facts, methods and limits, as well as the recognition of the influence and social results of Science.⁸ The concept of Public Understanding of Science hence spreads and is broadly accepted. Science begins to condescend; and a person doesn't have to be a scientist to share the joy of science discovery, as he/she doesn't have to be a musician while appreciating the music.⁹

VSMC uses network and information technologies in providing creative information of science communication for the public to share and appreciate,

(1) Design interesting modules that are easy to understand with information technology. For instance,

In the Lake Museum, use FLASH to explain how 10 kinds of lakes are formed in the history,
<http://www.kepu.net.cn/gb/earth/lakes/origin/index.html>

In the Xishuangbanna Tropical Botanical Garden, use virtual reality to show the Garden of Bamboos, Garden of Palms and Garden of Trees.

<http://www.kepu.net.cn/gb/lives/banna/dummy/index.html>

Design the "Giant Panda Contest", "Game against SARS", "Build a Space Shuttle" and other games to provide access to playful learning

http://www.kepu.net.cn/gb/beyond/spaceflight/space_virtual/index.html

Provide abundant videos with stream media technology in the "Giant Panda Cinema", "Xishuangbanna Cinema", "Virtual City of Ceramics", and so on.

<http://www.kepu.net.cn/gb/civilization/chinaware/xuni/index.html>

(2) Spread science method through deep communication with the science community. Take the

Panda Web-camera Channel as an example,

<http://www.kepu.net.cn/gb/lives/giantpanda/pandacam/index.html>

In traditional animal observation, human interference influences the behavior of giant pandas. The Application of web-camera brings to the scientists convenience as well as more authentic data. VSMC introduces this advanced research method to the public with the Panda Web-camera Channel. Users of VSMC could make real-time observation on Wolong Giant Pandas; Users with permission could control the camera remotely with Internet and a computer, observe Wolong Giant Pandas on his/her own, make observation records and take videos. With FLASH and virtual reality, a virtual Giant Panda Kindergarten reproduces the living environment of 6 panda cubs watched by the web-camera. Users could also watch videos taken through the web-camera in the past by the system manager.

Based on the Panda Web-camera Channel, VSMC organizes face-to-face activities of science communication in schools and nearby communities. Under the guidance of teachers, scientists and science communication practitioners, people could observe behavior of the giant panda on their own. Some kids (from age 11-12) in China and the U.S. form an observation group, making regular observation and records on the behavior of giant pandas. E-mail talks and videoconference discussions among the group members are scheduled in the near future.

(3) Tell science stories behind the scenes, sharing the happiness and tears of scientists with the public. For instance,

Release journals of the scientist on the expedition to the The Yarlung Zangbo Canyon

<http://www.kepu.net.cn/gb/earth/canyon/diary/index.html>

Reveal diaries of the scientists in the South Pole expedition

<http://www.kepu.net.cn/gb/earth/antarctica/diary/dia700.html>

Part Three: Achievement and Comment

In the past 5 years,

1 VSMC collaborates with 28 CAS institutes, over 80 organizations home and abroad like the China Science and Technology Museum and more than 100 scientists; VSMC has established 60 Virtual Science Museums in Chinese and 11 in English, with 300GB raw data and 30GB data on the website. Under the leadership of CNIC, VSMC initiated the establishment of FIPSE and joined the Union of Internet-based Science Popularization.

2 VSMC is well received by the public with its authentic information from the scientists and fascinating presenting methods based on information technology and high-speed network. VSMC counts 30 million visitors in total. In 2004, VSMC embraced as many as 30,000 visitors each day, ranking high in Alexa among the websites for science popularization in China.

3 VSMC receives continuous support from Natural Science Foundation of China and China Science and Technology Association. VSMC also collaborate with ITS center of Texas A&M University, a NSF funded research center on IT-enhanced science education. In 2004, VSMC was selected as one of the most excellent cultural websites by the Organizing Committee for China Internet Manners and Culture Project and was recommended all over the country.

4 An effective pattern for the project operation has been set up, building a community of Internet-based science communication among the science community, education practitioners, science communication practitioners and IT engineers.

Part Four: Discussion

1 With the spread of Internet and people's increasing trust on the Internet, Internet begins to serve as an important media for science communication.

“Most internet users and non-internet-users choose to believe the information on Internet. The proportion of non-internet-users who choose to believe the information on Internet is even higher than that of the internet users.” The attitude of non-internet-users toward Internet shows the great potentiality of internet-based science communication.

2 In the community of internet-based science communication, professional science communication practitioners are the core force and the science community is indispensable.

It's necessary to build a professional team with basic science concepts, theories of communication studies, information technology and experience of science communication, producing all kinds of information for science communication creatively. This team should serve as the core force of internet-based science communication, encouraging other participant forces and promoting the efficiency of the whole.

3 In science communication, different measures should be taken to communicate on knowledge, method, procedure and social responsibility of science.

“Compared with traditional science popularization, science communication emphasize more on Internet, TV, newspaper and other mass media...the purpose of science communication is to promote the public understanding of science...to make people have more decisive power on their own future.”¹¹ Science would serve the Society better when more common people could understand, appreciate and raise doubts on Science.

4 In the procedure of science communication, network and information technology bring possibility to build a bridge for the equal communication and mutual understanding between the science community and public.

Live broadcast of big science events, chatting room and BBS, video conference between the science community and the public, on-line lecture and the scientists, and so on.

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