

Communicating environmental protection and sustainable development ideas among teenagers

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ABSTRACT: To enhance the consciousness of environmental protection and foster the ideas of sustainable development among teenagers, some effective measures have been adopted in the process of science communication based on the feedbacks from youth, and in practice, the exhibition named “The Earth, Humankind, Challenges and Solutions” and the Nationwide Teenagers’ Creativity Match on Environmental Protection have been held successfully.

INDEX TERMS: teenagers, environmental protection, sustainable development, exhibition, creativity match

INTRODUCTION

By the end of 2002, there already existed more and more environmental pollution problems and the treatment would be very costly, but the severe situation was not recognized by the general public especially the teenagers who would be the future masters of the country. However, to make teenagers aware of the resource shortage, the environmental pollution and the essence of sustainable development takes time. Therefore, it is necessary to achieve following objectives: (1) to show the teenagers the proved environmental pollution in order to form the correct concepts of environmental protection; (2) to foster the ideas of sustainable development with the successful cases of using renewable resources and reducing environmental pollution; (3) to enable teenagers to use the concepts of environmental protection and sustainable development to impact on their daily behavior; (4) to call for their enthusiasm to solve the environmental problems around and to show the responsibility with their own efforts and daily practice. To accomplish these objectives, China Science and Technology Museum (CSTM) and the Center for Environmental Education and Communication of State Environmental Protection Administration (SEPA) have held a series of science communication events among the young people, by allying with major mass media and some leading multinational companies, such as DuPont and Arrow, and utilizing the social effect of an exhibition entitled Scientific Development Vision in CSTM.

THE SCIENCE COMMUNICATION PROCESS

1. Understanding the real demand of teenagers.

Longtime surveys have been made among teenagers. It has been made clear that the

impression on the education of the environmental protection and the sustainable development is as following: lengthy texts and striking photos have made them feel dazzled, and are not able to raise their interests. It seems that the sighting and the atmosphere in the exhibition have brought a negative psychological hint to the teenagers that the situation is pessimistic and insolvable. Although they have been given a caution to some degree by the pollution texts and photos, they do not know what to do and where to begin under the circumstances.

2. According to the feedback from the teenagers, science communicators began to prepare an exhibition on environmental protection and sustainable development with new ideas: The Earth, Humankind, Challenges and Solutions.

A. The conception of science and humanity have been introduced from various aspects of daily life, and making teenagers feel “environmental protection and sustainable development” is nothing beyond them. For example, a kitchen was set up in the exhibition hall and was equipped with some samples of ore mine, gas container, cotton and wheat ears, which are linked to cooker, gas stove, cloth and bread. To many teenagers, it is the first time for them to see these samples. In addition, the concepts of renewable resource and unrenovable resource are displayed beside. Gradually, the challenges of resource shortage we are confronted with are realized through further visiting. They are also conducted that the environmental pollutions, such as auto exhaust, environmental hormone, battery pollution and etc, will cause tremendous harm to people especially teenagers.

B. Realizing that most teenagers dislike the texts and photos of environmental pollution, we therefore had taken following measures: we made 12 major problems related to the earth’s atmosphere, water environment, land and biosphere into foldable display boards with simple texts and interesting cartoons. When teenagers finish reading the surface layer of the 12 boards, their curiosity is ignited, they find the boards can be unfolded, and a new layer appears and displays other aspects of the predicaments in the earth environment. The curiosity of teenagers motivates them to read one board after the other. It is obvious that they are deeply touched. A big model of the earth with 48 holes was installed. From each of these holes a picture of environmental pollution can be seen. We named the earth model “Look at the scars on the earth”. Teenagers seem to cast off their dislike of the environmental pollution photos and look into the earth model with great interest.

C. Pay attention to the interaction between exhibits and teenagers. For example, when the teenagers pass through a path in the exhibition, and step onto the glasses embedded in the ground, they will see some lighted cartoons themed of saving water, planting and other environmental protection. In other place, when they see a new water-proof and ventilated cloth, they will be told that the cloth is made of discarded old milk bottles, and that the new recycled cloth can also be used to cover the wooden houses. Thus the idea of material recycling has been transfused into them.

D. The successful sustainable development cases have been used to conduct teenagers to understand what the sustainable development is. For example, in our exhibition teenagers are given samples(1) of fast dissolving plastic bags, renewable corn-made fabrics, a 1 mm thin screen, hydrogen batteries, etc. During the process, they are taught with five principles of sustainable development(2) and asked to do their best. <1.> use the renewable resources; <2.> reduce the consumption of fossil fuels; <3.> design zero-emission production models;

<4.>recycle the thrown away products <5.> research on new products based on the natural laws.

3. The Scientific Development Vision exhibition sponsored by the Communist Party of China (CPC)'s Central Department of Publicity and China Association for Science and Technology (CAST) aroused wide public attention in China. Warned by numerous pictures of natural environment destruction in the exhibition, teenagers were still puzzled, not knowing what to do and how to do.

4. At this point, CSTM and SEPA's Publicity and Education Center held Nationwide Teenagers' Creativity Match on Environmental Protection, to inspire teenagers to find environmental problems around them. They were conducted to ask questions such as: do the plastic balls they play pollute environment? Can egg shells be used for some other purposes? Can grass be planted on the roofs of buildings? Is it necessary to build dams in our hometowns?

After the important and interesting objectives were decided, students actively took up research, investigated and collected materials, proposed work-plans and proved their feasibility. Finally, they harvested many unexpected results, making astonishment among their parents, teachers, evaluation committee members and even themselves.

The match accorded with the essentials of environmental and scientific education. Students who participated in the match felt their own potential, tasted the joy of success, so they gave up their previous impression that scientific research was difficult. The event aroused their interests in both environmental issues and scientific research.

The series of science communication have shown two major characteristics during its implementation.

Firstly, every step of the series of activities has been closely connected to each other. The feedback from teenagers has been frequently collected and analyzed and the exhibition plan has been adjusted from time to time. The creativity match on environmental protection was held on the basis of the analysis of the feedback from other exhibitions held earlier.

Secondly, various social resources have been combined together. The social resources are numerous: CSTM which has unique advantages in holding science communication exhibition; SEPA's Center for Environmental Education and Communication, which has been advantageous in providing environmental education materials; and several multinational companies such as Dupont and Arrow. The advanced technologies of DuPont enabled the exhibition "The Earth, Humankind, Challenges and Solutions" to be feasible. It also offered financial and material supports to the event. Arrow provided financial supports to the Nationwide Teenagers' Creativity Match on Environmental Protection. CAST and the Central Publicity Department of CPC have advantages in mobilizing, organizing and publicizing the social events while the mass media has widely reported the events, to increase people's curiosity of participation

EVALUATION

Science communication effect

1. Since November 2003 when “Earth, Human kind, Challenges and Solutions” was first opened to the public, the exhibition received more than 660,000 teenagers from all over the country. Compare with other environmental protection exhibitions, teenagers have shown higher enthusiasm in this one. SEPA has referred the exhibition as a successful case of environmental protection to its nationwide subordinate departments.
2. Scientific Development Vision Exhibition received a total audience of 160,000 in two months. Media reports of the exhibition surpassed 5000 pieces. The massive reports created a good social atmosphere for teenagers to accept the concepts of environmental protection and sustainable development.
3. The Nationwide Teenagers’ Creativity Match on Environmental Protection covered 30 provinces, municipalities and minority regions in China. More than 100,000 students in over 10,000 schools were involved. A total of 630 competition articles were received, including 273 from primary schools, 305 from middle schools and 52 from universities. Many of their achievements are worthy of further promotion.

Evaluation on the science communication

1. Series of science communication activities focused on environmental protection and sustainable development have made teenagers understand the situation of environmental pollution and resource shortage , the concepts of environmental protection and sustainable development. Meanwhile teenagers have been enabled to solve the environmental problems around them with their own hands. They have showed great enthusiasm in building the road toward sustainable development.
2. Teenagers began to evaluate their everyday behaviors with the conception of environmental protection and sustainable development. However, to form healthy behaviors and environmental friendly practices needs more sustainable and high-level education.
3. Chinese teenagers have been heavily loaded by their homework., and their science education has little relevance to their daily life. Nowadays, many students do not know why to learn and what to learn. Joining the science communication activities has played a positive role in promoting the healthy development.
 - A. The series of science communication activities were in accordance with the trend of the world’s science education(3). To spread scientific knowledge was not only the aim of the activities, but also to promote teenagers’ understanding of the environmental issues and their passion to science. When they have found science could be used to solve the environmental problems around them, they will spare every effort to study science.
 - B. The series of science communication activities concerned about teenagers’ psychological and thinking process. Students were activated with the world’s advanced environmental protection harvests. By trying to solve environmental problems around them, many teenagers gained the experience in doing scientific research, thus their innovation potentialities, critical mend and deep-going scientific thinking would develop step by step, they become more confident, active and capable of solving practical problems.

DISCUSSION

To make an effective science and technology communication, the resources of teenagers themselves should be appreciated and inspired. On the one hand, the organizers should be acquainted with plentiful information on certain field and its further development in order to control the speed and the trend of science communication activities, their main role should be steer the teenagers to determine a proper objective and to support themselves to take part in science communication activities by making suggestions and encouraging parents, schools, research institutes, libraries and so on to create the social atmosphere.(4) Teenagers should also be encouraged to challenge the authorities when ever necessary, that's to say that young people should have critical mind and radiative thinking so as to take actions on their own initiative. On the other, teenagers should not be regarded as passive receivers. They have their own experience and knowledge construction, when they are confronted with obstacles, they have their own choice and speculating even though they are quite young. We believe that teenagers have the wisdom and ability to deal with difficult situations effectively and miraculously if they have an interesting objective.

CONCLUSION

1. In the process of science and technology communication in targeting youth sector, the positive results can be generated even though the communication content is not so attractive or sometimes boring if teenager's curiosity is ignited and made full use of. For example: the earth model named "Look at the scars on the earth".
2. Determining the reasonable objectives and steering teenagers to experience the scientific programs, that's an effective way to guide youth to participate in science communication activities.

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REFERENCES

- 1.<http://www.dupont.com>
- 2.<http://www.chinaeol.net>
- 3.*Science For All Americans* , by the American Association for the Advancement of Science (AAAS), translated by CAST, Beijing: Science Popularization Press, 2002
4. *How We Think*, by John Dewey, translated by Zhang Wanxin, Beijing: Jinhua Press, 2001.