257. Role of Hands-on activities in Science Communication

Amit Kumar Jana[1] and Arijit KumarJana[2]
[1]Science Communicators' Forum
Kolkata 700 014
ajana2004@rediffmail.com
akjana4321@gmail.com

[2]Taxxila-Anveshika-IAPT
8/4-AL, Salt Lake, Kolkata-700091

Abstract. Science and Technology are the two basic components of developments of a country. Common people can learn about the advancement of science and technology with the help of mass media. A science communicator connects the common people and the scientists by acting like a bridge. The main function of science communication is to exchange information between an informer and a receiver.

To make science communication interesting and informative, it should be activity based hands-on demonstrations. In this paper the author presents his experiences of such type of communication as he is engaged in two projects simultaneously namely Teachers' Orientation Programmes as well as Interactive Science Workshops for the middle school students.

Keywords: Hands-on, Scientoons

Introduction

Science education now-a-days looks uninteresting and sometimes boring. Students are interested for more lucrative career options other than pure science. But no country can progress without the development of science. So we have to be more serious about the way of presentation of the concepts of scientific principle. One way of effective science communication is the hands-on demonstrations. It is difficult to surpass the learning impact of the combination of hearing, seeing and doing.

According to the renowned science communicator, Dr. Manoj Patairiya, digital media now-a-days plays tremendous possibilities for science and technology communication among various target groups (Patairiya, 2000). Although Professor Yash Pal, the famous National Professor, information technology and digital technology are not knowledge creators but knowledge workers (Patairiya, 2009).

Again Scientoons are a new type of methods of effective science communication by using cartoons based on scientific theories (Ray and Dutta,2009). Science outreach programme is one of the fruitful approaches for science communication (Jana, A.K. 2010).

Hands-on Demonstrations

Experiment No. 1: Action and reaction.

When a balloon is attached in the string with a straw, it will move in the opposite direction to that of the direction of the air flow from the balloon. But when a post card is attached on the same straw with the balloon, there is no movement of the balloon as the action and reaction acting on the same body.

Experiment No. 2: Simultaneous decrement of pressure with the increase of speed.

An inflated balloon is placed in each of the thermocole glasses, one having a few windows and the other with no window. A straw is introduced through a hole at the bottom of the glass. When air is blown through the straws, the speed of air inside the glass is increased creating low pressure. The air with higher pressure from outside press the balloon on the mouth of the glass without window. But in the case of windows the air rushes in the glass through the windows and makes the balloon fly. This is a nice demonstration of Bernoulli's principle.

Experiment No. 3: Effect of atmospheric pressure.

The experiment of the rise of water level in the inverted glass which covers a burning candle placed in water is a very common demo used by many teachers to show that 21% of the air is oxygen. But using unequal number of candles it can be shown that the rise of water has no relation with the oxygen content in air. More the number of

candles more is the rise of water.

The reasons are:

(i) The pressure of hot air is high and some air escapes and hence the rise of water due to this loss.

(ii) At higher temperature the saturation vapor pressure of water is also high. When the candle goes off and

the temperature falls, saturation vapor pressure also decreases and hence the water rises.

Experiment No.4: Electromagnetic Induction.

When a magnet is falling through a vertical conducting tube with poles along the vertical, a changing magnetic field is produced. This field drives an electric current in the circumferential direction along the length of the tube. The magnet thus experiences an upward damping force and takes an extraordinarily long time to fall through the tube due to electromagnetic damping.

Conclusions

Being a resource person of a few projects of teachers' as well as students' orientation programs since 2005, my experiences confirm that students are observant and curious-they love to explore the world around them. Their scientific skills can be improved by teaching them the scientific concepts of the relevant scientific principle with activity based hands-on experiments (Jana, A.K. 2010). According to Kala (2009), 'Hands-on science activities have some advantages over other communicators, as the great compromise of literacy and knowledge label is only possible here.

References

1. Patairiya, Manoj. Science Communication through digital media. NCSTC Communication, 2000.
2. Patairiya, Manoj. Science Communication through Digital Media: An Indian Perspective. M. F. M. Costa, J.B.V.Dorrio & M.K.Patairiya (Eds.)Proceedings of the 6-th International Conference on HSCI. October 2009, Ahmedabad-India, pp.1-10.
3. Roy, A and Dutta, A. Cartoon for communicating science-an emerging trend. M. F. M. Costa, J. B. V. Dorrio & M. K. Patairiya (Eds.) Proceedings of the 6th International Conference on HSCI. October 2009, Ahmedabad- India,pp.60-70.
4. Jana, Amit Kumar. An Innovative approach to promote Science Education through Hands-On activities. D.Stavrou & P.Michaelidis (Eds.) Proceedings of the 7th International Conference on Hands-on Science. July2010, Rethymno-Crete, pp. 159-161.
5. Kala, L. Hands on Science: Towards Total Knowledge Transfer for S&T Communication. M. F. M. Costa, J. B. V. Dorrio & M. K. Patairiya (Eds.) Proceedings of the 6th International Conference on HSCI. October 2009, Ahmedabad-India, pp.376-379.