Advancements in Science Teaching

Submitted by

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Our teaching should also reflect the advancements in science and technology. One important thing that we must remember that, the curriculum has made activity oriented and child centered. The emphasis is given on learning by doing, rather than learning only text.

i) **Learning Activity Centre**

Investigating and experimenting are great ways for children to form knowledge relating to science and increase their understanding of scientific ideas. Hands on experiences help children think critically and gain confidence in their own ability to solve problems.

Young children especially are engaged by things they can touch, manipulate, and change; and by situations that allow them to figure out what happens.
  – in short, events and puzzles that they can investigate, which is at the very heart of scientific study.
  If a child learns to learn then our purpose gets fulfilled. This is possible through learning activity centre.
  The big advantage of such centre is that the child has a freedom to do what he / she likes to do. Thus, the child enjoys the process of learning.

The learning activity centre should contain a variety of activities geared to the varying intellectual ability, maturity, and interest levels of the children. Learning activity centre gives freedom to the children to test all the possibilities come in their mind experimentally. Thus, it helps to provide an opportunity for creativity.

After performing the activity children analyze the collected data and draw conclusions. While hands on science experiences work well, they can also be messy and time consuming.

ii) **Use of Multimedia in Teaching - Learning Process**

Because of the revolution in information technology and telecommunication, most students are aware of some of the areas of science, such as the exploration of outer space, the hunt for the fossils of extinct dinosaurs, newer technological advancements. Through various media, students are exposed to scientific fictions as well as facts. It is critical that students understand the differences between science facts and science fictions. When students study significant scientific theories, history of science, and the evolution of science, they recognize the value of obtaining and relying on evidence.

Radio, and more recently television, has played a major role in the field of science communication. The SITE experiment in the mid-1970s was probably the biggest social experiment anywhere in the world that established the importance of satellite communication in the field of education. Ever since, educational technology has come to be regarded as an important means for universalisation of education in India.

The **widespread use of personal computers** (PC) since nearly two decades ago advances in telecommunication, and Internet a decade ago along with convergence of various technologies has, in the form of Information and Communication Technology (ICT), opened up new opportunities and challenges in the field of education. Although the vast potential of ICT in the field of science education has been well recognized, it still remains largely untapped.

The efforts have been piecemeal and sporadic. A beginning for introducing computers in the school system was made through the Computer Literacy and Studies in Schools (CLASS) project in the early 1980s. However, schools faced problems of infrastructure, appropriate software, and lack of trained manpower.

Today, the scenario has changed: with the increasing use of personal computers in schools, homes and workplaces, and internet connectivity, ICT shows renewed promise as a powerful tool for education, but only if these developments are complimented by making available quality software in different disciplines of science.

Appropriate **multimedia software** both in English and other Indian languages suited for various age groups in schools is still a rare commodity. Development of software is an expensive affair and the Government should make sufficient funds available for the purpose. Software produced should be widely disseminated via Internet and CD-ROMs.

The Internet opens up vast possibilities; it could provide an e-platform for discussion of topics relevant to school children both scholastic and co-scholastic where students and teachers could post queries, provide answers, discuss with experts, and exchange views. Innovative scientific experiments using a PC could be designed for school students through a software and hardware interface to help students to measure common physical parameters (e.g. temperature, luminosity of light, humidity etc.), and also control these parameters. Such applications would serve to introduce the role of computers in industries, laboratories, communication and so on.

On 20 September 2004, an artificial satellite EDUSAT was launched. It is specifically designed for the educational purpose. It provides an interactive satellite-based distance education system for the country utilizing audiovisual medium, and employing Direct-To-Home (DTH) quality broadcast.

With its multiple regional beams covering different parts of India and a beam covering the Indian mainland, it is possible to establish talk-back terminals - one way video and two ways audio - for interactive programmes on science education.

These would provide an interactive channel for students with experts and could include talks, lectures / demonstrations, discussions, question-answer

sessions, etc. Talkback terminals and receive-only terminals could be set up at selected schools that could also be utilized by other schools in the neighborhood. To fully utilize the capabilities of EDUSAT, necessary hardware would need to be made available and efforts strengthened to produce quality software at regional levels.

The importance of community FM radio in science communication needs also to be emphasized. Such low-range community radio stations could be established at selected schools and the school students encouraged in producing science programmes relevant to the local areas. The audio channels of EDUSAT could beam such programs over wider areas.

Satellite Radio has opened up the possibility of a countrywide digital audio science channel. It can cover the remotest and most interior parts of a vast country like India with the help of a specially designed satellite radio receiver.

This digital satellite communication radio system uses geosynchronous communication satellites dedicated for radio broadcasts and is essentially a direct-to-home radio (currently under the name World Space Radio). Access to news, educational broadcasts, and entertainment from all over the world through its unique global relay capability are the remarkable features of this system.

Two-way interactivity is possible through telephone lines. In particular, production of software is relatively easy and cheaper to produce. Satellite Radio can prove to be an important tool for science communication / education in India. Since the broadcast is digital, it is possible to download data files along with pictures, sounds, and movie clips into a PC.

It is hence possible to transmit and receive slides /visuals, store them in a personal computer, and synchronize with the audio broadcast for a full fledged lecture-cum-demonstration which can be projected on to a large screen to an entire class. Photographs of various things such as bacteria, viruses can

be shown on the screen. Visuals can help us to explain abstract concepts so that they become concrete.

Smart Class is a solution designed to help teachers in meeting with new challenges and developing students' abilities and performance. Smart class is an interactive and sophisticated way of teaching. It uses various technologies such as TV, LCD, computers,etc. It helps the teachers to access multimedia content and information that can be used for teaching students more effectively. It helps the teacher in expressing their views and teacher ensures that every student is learning.

A well designed module of smart class allows a student to visualize the concept much better than static images. ICT as a tool should be used with care so that it serves to bridge the social divide and equalize opportunity; inappropriate and insensitive use may as easily widen the divide. Given the growing reach of the technology, it is imperative that efforts are initiated to utilize ICT at the school level to prepare children to face the challenges of a society that is fast transforming into information driven society.

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