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1. Add consistency of textual hierarchy.

## INTRODUCTION

### What was this workshop about?

Take from  
back cover

The Government of India is planning to launch EDUSAT, a satellite exclusively meant for educational transmission in 2005. A part of the transmission capacity of the satellite will be reserved for science education programming.

Co-ordination and management of the science communication component of EDUSAT will be the responsibility of Development and Educational Communication Unit (DECU) of Indian Space Research Organisation (ISRO). DECU has been engaged in the activity of using television as a medium of communication for development and education for almost 30 years.

This report concerns the making of an action plan for involvement and participation of NGOs, academic institutions, media makers and other interested individuals in the activities related to the proposed Science Channel.

The process was launched with a workshop held on 21 and 22 January, 2003 in Mumbai. The workshop presented an opportunity to create a wide-ranging coalition to cooperate with DECU, <sup>and DST</sup> in planning and realising the Science Channel.

Members of the coalition could work together:

- to develop briefs
- to enter into production
- to facilitate pre-testing
- to provide feedback on programmes
- to find facilitative resources for programme-making
- to find financial resources for programme-making

The workshop was organised for DECU by Comet Media Foundation, an organisation producing educational media, with a long association with DECU. It drew some 40 participants representing a cross section of NGOs, institutions and individuals involved in science communication and education. The expectations of the workshop were

set out by the organisers at the beginning. This was followed by presentations on the current broadcast scenario and the possible role of the science channel in that context, the technology configurations to be available and their feasibilities.

Next came a series of presentations of research findings on audience perspectives on television programming. This was followed by discussions which effectively helped participants to introduce their work and preoccupations to the group.

On the second day, the participants divided into four small groups to discuss five sets of issues:

- content and approach
- software generation strategies
- receiving-end management
- multiple media strategy
- self-sufficiency of the channel

The suggested topics worked as triggers, and the ensuing discussions and debates covered much ground, with important recommendations emerging at the end.

The workshop concluded with the groups' presentations followed by discussions on the various issues raised. Then, as the participants headed away to catch their trains and planes, those who had a bit more time lingered on, and informally the discussion started moving towards the realisation of the ideas that had been set in motion.

Starting a project such as this poses complex challenges, and this report is an expression of the concerns and the excitement of the participants. As we wrote this report, we went over the various views, the group discussions, the research articles, and all these threw up potential ideas for getting the channel started, which are given in Section 5 under the title *Learning by doing*. We hope these suggestions work as a stepping stone for evolving the Science Channel for India.

I would like to thank all the participants, who came despite crowded schedules. People came with expectations, shared their thoughts and expressed great excitement about the Science Channel.

To our delight, several people reserved time to contribute rapid appraisals of audience expectations and observations on science programming on TV. For this, thanks go to Amman Madan, Sagarika Golder, the Communication and Media students of SNDT, Aisha Kawalkar, Gauhar Raza and Surjit Singh; and to Father Gaston Roberge (who could not come) for getting colleague Subha Das Mollick to discuss the questions with students in Kolkata, and to contribute this to the workshop.

I would also like to specially thank B S Bhatia, Director DECU for initiating this workshop and his enthusiasm and encouragement all through; K Shankara, Director, SAC for his support; Vinay Kamble for DST's and his personal involvement; M L Hasija for his exposition on hardware; Subhash Joshi of DECU's Social Research Group for his constant steering of the workshop process and for sharing his insights; R G Gade for working out the management aspects; Hansa Joshi, Gayatri Ayyangar and all the participating producers and researchers from DECU who helped to make this event a success.

Patricia Mascarenhas, Mrunalini Jog and V P Jacob have to be thanked for all the planning and arrangements that made the two days flow so smoothly. They were supported by Ujjaini Bhattacharya and Pradeep Sawardekar.

For this report, thanks go to Mira Desai who guided her students at SNDT Women's University to record and produce the first verbatim text. Thanks also to R Sarada for further writing and editing work on the report and Amir Rizvi for its design. I hope I have not left anyone out!

*People came with expectations, shared their thoughts and expressed a great deal of excitement about the Science Channel.*

So here is the report—we now await your reactions. This is an open invitation to all who read this document to come forward with your ideas and proposals to DECU.

In the meantime, DECU has set up a deadline of August 2003 to make a kind of "channel launch" not on air, but by announcing the activity with a public presentation, which then puts the project into full motion, on the run-up to the satellite launch.

Thus the immediate objectives are:

- to build a network of contributors for production, monitoring of audience needs and receiving end facilitation.
- to develop a chart mapping the commitments of time to different audience segments.
- to produce some pilots or flagship programmes which represent the potential of the channel, to pre-test and develop into series.

DECU expects that these pilot programmes would define the channel, give it a character and identity. As programmes get ready, they could even be broadcast on other channels to create a name and expectations even before the Science Channel is formally launched.

Some networking, projecting and proposal-making has been going on in the past few weeks. The very first upshot of this workshop has been the creation of an e-group called AzZ for exchanging ideas on the Science Channel. For details, please reach me at comet\_media@vsnl.com.

The excitement to get the Science Channel up and going is palpable. It is a wonderful opportunity to be witness to a project at its very inception, and to watch it as it grows.

*find a good name for it, and*  
Let us see what happens next!

Chandita Mukherjee  
Mumbai, April, 2003

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# 1

*Proceedings, 21<sup>st</sup> January, 2003*  
**BRINGING IN THE ELEMENTS  
THAT KEEP GETTING LEFT OUT**

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- A channel to reflect people's aspirations, concerns and understanding

*opening remarks by B S Bhatia*

- Conceptualising and implementing such a channel

*workshop participants in conversation with B S Bhatia*

## 1. BRINGING IN THE ELEMENTS THAT KEEP GETTING LEFT OUT

**A channel to reflect people's aspirations, concerns and understanding**

*opening remarks by B S Bhatia*

---

B S Bhatia is Director, DECU, SAC (Space Applications Centre), ISRO and a person with many years of experience in the field of educational media related to development issues.

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Giving a background to the Science Channel, he said that science communications is a longstanding commitment with ISRO right from the SITE (Satellite Instructional Television Experiment) days in the early 1970s when ISRO reached satellite TV to audiences in the rural areas. One of the important objectives of SITE was science communications and people in leadership positions then, Prof Yash Pal, Prof E V Chitnis and others, had ensured production of a special stream of science programming for rural school children.

During SITE, the team understood that communicating science is not just about explaining scientific phenomena but looking upon science as part of the everyday activities of life. It was felt that it is important to build up the scientific attitude of audiences, not merely to impart factual information, so the method of science was emphasised. For many, this was the beginning of a lifelong process of learning what science communication could be about, and several known science communicators today started their careers with SITE.

After SITE (1975-76), ISRO was keen that science and educational communication should take a more concrete shape and the DECU unit was formed, taking up a number of projects in subsequent years. These include the Kheda Communications Project (KCP) started as a part of SITE, which continued till 1989; the Jhabua Development Communications Project (JDCCP) undertaken during 1996-2000; and the Training and Development Communication Channel (TDCC) on INSAT, operational since 1995, providing satcom-based distance education.

Simultaneously, there were other developments in educational communications. The CIET under NCERT, and its counterparts in the states, the SIETs, were formed with the mandate of making media for school education. The UGC started off its countrywide classroom and a set of EMRCs came up all over the country with the CEC coordinating them. More recently, IGNOU came in with its Gyan Darshan channel.

Thus, some kind of educational programme production and transmission have been going on for some time, growing in its own particular fashion. Yet somehow, the educational programming being produced was not very wide in its reach, and in all this activity there was no special space for science communication.

For some time, ISRO has been keen to put up a satellite dedicated to educational communications. Recently, this idea was presented to government again, and has been agreed upon in principle, in the form of EDUSAT. The programming on EDUSAT would cater to the educational needs of the country as a whole, covering primary, secondary, and higher education, continuing formal education and some non-formal education.

Since the satellite would have a large capacity, it was thought that ISRO should additionally run a channel dealing exclusively with science communication, apart from the requirements of the formal curriculum.

When the EDUSAT project was being presented to the Ministry of Human Resource Development (MHRD), Dr. Ramamurthy, the Secretary of the Department of Science & Technology (DST) had remarked that EDUSAT should really stand for Education, Science and Technology. Taking a lead from that, DST was requested to join in developing the Science Channel.

Though the Science Channel is being started by ISRO and DST, they are keen that it should not become a government channel in operational terms. In other words, it should not be reduced to a forum of publicity for CSIR laboratories or the projects of the DST. It should be the people's channel, where everybody can participate and have their questions answered.

This is how the idea for this workshop, involving media persons and voluntary organisations working in the field of science communications at the grassroots level, came up. If the channel is to reflect people's aspirations, concerns and understanding then this group's involvement was critical in defining the content and format of this channel. The workshop is a first attempt to explore how such organisations could get involved in conceptualising and implementing the channel.

B S Bhatia expected that such workshops should help in defining the structures that the channel would work within. He hoped that the participants would be able to propose mechanisms whereby people like themselves could be continuously associated with the conceptualisation, implementation, programme production, transmission as well as reception of this particular channel over a period of time.

He added that DECU did not have something clear and definite by way of structure to offer at this particular stage. If something is too defined in the beginning, then there is a risk of it becoming rigid and failing in its purpose.

Both the ISRO and DST want the structure to be participatory and to involve as many organisations as possible. It is proposed there should be a Satellite Education Authority (SEA) to regulate EDUSAT, agreed to by MHRD in principle.

Mr. Bhatia concluded by appreciating the lead taken by the Secretary DST, who said that at this stage no one should ask any questions about funding sources, because if the activity is worth it, the funds will be found.

This is the stage where all the participants could help in defining something which is meaningful and sensitive to the needs of both the audience and the subject, so it does not lapse into something routine and government-oriented. It was with this hope that this meet was organised.

#### **Conceptualising and implementing such a channel**

*workshop participants in conversation with B S Bhatia*

*Who is going to be on the Satellite Education Authority?*

Chandita Mukherjee asked about the composition of the proposed Satellite Education Authority and the thinking on its operational aspects. B S Bhatia responded that nothing has been defined precisely as yet. An authority will be registered, it is going to be autonomous and the constitution of it depends on the DST, MHRD and ISRO. It seems that educational bodies from primary and secondary education, UGC, CEC, NGOs etc would be represented.

*How do we humanise science?*

Venkatesh Chakravarthy commented that a major worry was how to locate science—do we place it in some kind of great narrative of progress or do we humanise it in some sense? In the way science is usually taught in schools and colleges, something from above is addressed to somebody below. We will have to think from the point of view of an alternative pedagogy, connecting science to everyday life. What would then happen to the discourse of development and uplift? He hoped the question of approach would be discussed at this workshop.

***At this stage no one should ask any questions about funding sources, because if the activity is worth it, the funds will be found.***

***The Science Channel should become the people's channel, where everybody can participate and have their questions answered.***

***It should not be reduced to a forum of publicity for government science and technology programmes.***

*How do we formulate a new model for managing the channel?*

Gauhar Raza's concern was that there are broadly two organisational models available to us in India—the private TV channel and the government channel. Perhaps we need to develop an alternative model for the Science Channel. SITE was an example of a successful structure created within government, but that era has passed, and we may have to come up with something more suited to the present. He proposed a later workshop to look at management structures, drawing from international and national experiences in broadcasting, in order to discuss and formulate a new management system for the Science Channel.

*How soon do we start?*

Vivek Monteiro wanted to know the time frame for the EDUSAT process and the milestones within that. Mr. Bhatia pointed out that the work on the satellite has started and it will be launched in about 24 to 30 months from now. However, even before that, some pilot software exercises and configuration exercises are going to start. In fact, such exercises are already being discussed with some agencies <sup>working in</sup> areas such as primary education, open universities or <sup>and</sup> higher education institutions like teacher training institutes. Two to three such pilot exercises may start within another six months. <sup>people from</sup> The group meeting here should also propose some production exercises.

~~Bhatia,~~  
~~To answer the time frame question, ISRO is trying to examine different kinds of networks, starting some pilot production exercises within six months and EDUSAT will become available in two years' time.~~

*Much more than a TV channel*

B S Bhatia emphasised that we should not look upon this as a TV channel alone, because the satellite will also give us opportunities of data broadcasting and computer connectivity. We must look at the possibilities of networking between organisations. This system will

allow us to interact over the phone or through computers, and the reception aspect is totally flexible. Separate reception networks can be set up for different kinds of target audiences and different information objectives. That is why we have to specify which programmes will be received at which places, where computer centres will be set up and so on. It is not like a TV channel that can reach only as far as the place that the cable operator agrees to take it to.

*What standards are we setting for ourselves?*

Russell Gonsalves asked if we are setting a channel like Discovery Channel as a benchmark for ourselves, or are we talking about something low cost? Mr. Bhatia's opinion was that definitely one of the starting points of the thinking process was "Why can't we have an Indian equivalent of National Geographic and Discovery?" While models like this are very much there in our minds, one must think of how to adapt them to our requirements and funding limits. Going beyond formats, we must see how to make it a people-oriented channel.

*Can funds be sought from outside government?*

Chandita Mukherjee wanted to know if there would be scope for organisations which can muster resources on their own to come to DECU with their proposals for broadcast. Mr. Bhatia remarked that the more you can raise from outside the better, it makes you less dependent on government—but it remains to be seen how much can be got from outside.

*Responsive, flexible and quick system needed* <sup>Sacob's</sup>

Sunil's <sup>concern</sup> was making the system responsive, flexible and quick in decision-making. For example, <sup>after</sup> the recent Gujarat cable car accident—~~right then~~ a lot of people were interested in knowing about how cable cars work—how quickly would our channel be able

respond to a need like that? We need to build a data-base of knowledgeable people who can respond with authority to current events and bring out the scientific issues involved.

#### A space for people's science

P.V. Satheesh wanted to ask those who were fired by the SITE experiment how science could be re-looked at within the context of Indian villages 30 years later. He said that staying in a village for the last 15 years had completely altered his vision of science and the role of people in shaping it. He can now see a fascinating form of science out there waiting to be discovered, and it has to be shown to audiences from a perspective very different from the usual way science is portrayed. Can EDUSAT legitimise that science, because through various means, including media, we have delegitimised people's own science and imposed a different kind of science on them?

#### Bringing in left-out elements

B.S. Bhatia said that the whole purpose of the meeting was to find and bring in things that are getting left out. At the previous meeting in Delhi, Prof. Yash Pal said that "Let nobody be a mere audience, let everybody be a contributor to the channel." Several organisations are looking at the science and technology that people themselves are generating, and we can call on them to see that the channel reflects a concern for people's science.

#### New technologies allow new interactive narrative forms

Chandita commented that compared to SITE, this time we shall be able to make programmes specifically tailored for particular audiences, and which could unfold the way the audiences wanted them to. Great decentralisation is possible. Audiences can talk directly to each other live, shaping programmes in ways unimaginable earlier in studio-based anchor-dominated shows. The technologies of image-making and editing have evolved so that material can

be adapted and reshaped very easily to suit different viewers and the process need not be dependent on the original maker. At the same time, material made for specific purposes can be reshaped to suit many more audiences so that needless duplication does not take place.

Sunil Jacob commented that we should look beyond broadcast, perhaps explore possibilities of synergy between available technologies, even at communication techniques where <sup>electronic</sup> technologies are <sup>not</sup> required.

#### Scope for regional languages

Mohan Kumar of CDIT wondered if the Science Channel would have regional language transmissions. Mr. Bhatia said that the satellite will allow several national channels and several regional channels focusing on different geographical areas. Producers can look at both national and regional possibilities.

#### Scheduling for specific audiences and their viewing times

Meher Engineer felt that it is trivial to sort the audience into categories that are familiar to us—such as pre-primary school children, primary school children etc. There are millions of people out there, not part of any school system, and having their own work schedules, who would be free to tune in only at times suitable to them. He shared his experience of working with women agricultural workers in West Bengal who are available for only an hour after 4 pm, or after 8 in the night for any group activity. Moreover, these timings change from season to season. There is a need for identifying audience categories and finding out the best time to reach those groups, and being flexible about it.

#### Depicting the diversity of the country

Getting to know the diversity of the country is an extremely important part of education, and the channel should be able to show this. The first phase of this operation should be to create a working

Can EDUSAT legitimise people's own science, because through various means, including media, we have delegitimised it and imposed a different kind of science on them?

alliance of a wide range of partners involved in taking science to people from all over the country, followed by a second phase to create a channel based on this alliance. The programming should reflect the diversity of the origins of these participants.

B.S. Bhatia remarked that what we are discussing today will one day become an operational system, something like 50-58 channels, available 24 hours a day, 365 days a year and for years to come. We are talking about the educational needs of a very wide spectrum of people. There will be multiple channels and languages, and we have to identify the different sections of the audience and understand what they are looking for.

*Building a framework with room for evolution*

Mr. Bhatia added that EDUSAT is something that will evolve over a period of time. It may start with primary or secondary education or some form of non-formal education. However, right from the beginning, we must build a framework within the system so that it develops as we go along, and in the long run, meets the evolving needs being identified in the course of telecast.

*How do we humanise science?*

*How do we formulate a new model for managing the channel?*

*How soon do we start?*

*New technologies allow new interactive narrative forms—this can be much more than a TV channel*

*What standards are we setting for ourselves?*

*Can funds be found from outside government?*

*Responsive, flexible and quick system needed*

*We have to look for the things that are getting left out and bring them in*

*Scheduling for varied audiences and their viewing times*

*Depicting the diversity of the country*

*Building a framework with room for evolution*

## 2

### A PEOPLE-CENTRIC APPROACH

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- Overview of broadcast scenario and role of science channel  
*presentation by Subhash R Joshi*
- Feeding the science channel  
*presentation by Dr Vinay B Kamble*
- EDUSAT plan, ground segment configuration and technology  
*presentation by M L Hasija*

## 2. A PEOPLE-CENTRIC APPROACH

### Overview of broadcast scenario and role of science channel

*presentation by Subhash R. Joshi*

Subhash R. Joshi heads the Social Research Group in DECU and has conducted and guided many research studies in the area of social communications. He began by giving us a background on the television scenario in India today.

According to estimates, out of 200 million households in the country there are:

- 78 million estimated television households
- 38 million out of these 78 million households, access cable and satellite channels (C&S), mainly in urban areas
- This means that about 120 odd million households don't have access to a television set at their homes, though there may be some public community television sets

The channels accessed by these TV set owners are:

- DD1, the only channel available to all 78 million households
- DD2, available to many without cable subscription
- C&S households typically get about 50-60 channels, depending upon the efficiency of the cable operator and local competition.

He categorised the channels as:

- Variety entertainment and information
- News
- Music
- Sports
- Children
- Movies
- Educational
- Regional language channels

The predominantly popular category is the variety entertainment type, which has some information component, like Zee, Sony, Star Plus. Then there are those that have documentary, sports

and news programmes and current affairs.

Then come the niche channels like music, sports etc. We don't have specific Indian channels for children's programming, but there are quite a few American channels for children such as Cartoon Network, Splash, Nickleodeon and others. These are followed by another set of niche channels featuring the movies, and then the educational channels such as National Geographic, Animal Planet and Discovery.

Apart from these, there are the regional language channels. Extremely popular in their own areas, they have high densities of viewership, and they largely belong to the variety entertainment group.

In viewership:

- DD1 has maximum reach
- Most popular programmes are the 'K' series
- Followed by movies, news, sports

Though the urban viewer may not realise it, DD1 has the highest viewership in the country. The most popular serials are from the family genre, many of which belong to the 'K' series, several are daily soaps. The next in line of popularity are movie, news and sports channels. The popularity of sports channels depend upon the event. For example, during the World Cup, the channel carrying it live will become the most watched.

Television is undergoing a major change because of rapidly evolving technology, and it is no longer a one-way medium. Moving to the future, Subhash Joshi pointed out the new trends that appear significant.

*Interactivity* is increasing and the traditionally separate sender-receiver identities are blurring. Convergence between technologies is taking place

very fast and technologies are becoming more and more user friendly. This leads to greater decentralisation and democratisation of the media. These trends must be encouraged.

The structure of traditional broadcasting always had one sender and many receivers. Because of this, when satellite based transmission first came, fears were expressed about the over-centralisation of communication. It was felt that a single point of view would monopolise the air waves, suppressing other voices.

Experience showed that this actually depends upon how people choose to operate that technology, rather than something built into it.

Today it is possible to have highly *decentralised* and *interactive setups* with the use of satellites, and a blurring of the boundaries between senders and receivers is going to take place.

At the same time, technology itself is becoming simpler and more *user-friendly*. As it gets demystified and various media converge, even the division between the electronic media and the print media ceases to matter.

You can read any newspaper brought out anywhere in the world today in electronic form and it gets updated constantly. Phone-in programmes, from film music farmaish shows to question-answer sessions with sports personalities, are common on the commercial channels.

ISRO has carried out several experiments with interactive TV. There is an interactive television channel called TDCC which is narrow-casting (broadcasting for selected groups of people) in almost all the states of the country. Right now, it is largely a one-way video and two-way audio system. The studio and a few selected centres have two way video

links so both can see and talk to each other.

Thus, interactivity, de-centralisation, *convergence* and *sender-receiver blurring* are issues to keep in mind when thinking about the new channel.

What would the goals of our effort be?

We have the responsibility to see that media in India becomes *people-centric* and not government-centric, advertiser-centric and sender-centric. Today's technology may permit us to move away from the sender-centric approach to a more people-centric approach quite smoothly, but we will have to make an effort to involve more and more people in the formulation of the content.

To find out what people want rather than deciding what people should have, there is need to *synergise the efforts of individuals, government and non-government organisations*.

To be effective, our media must take an *end-to-end, holistic approach*, right from assessing the needs to content development to production, distribution and feedback wherein all elements are attended to in an integrated way. The producers of programmes cannot have the attitude that their job finishes with making a programme. The transmission, the whole circle of sender and receiver, feedback and response, also is the producer's concern, and this kind of holistic approach is needed.

The *production and technical values* have to be of a high quality, and the channel must have an *Indian personality*. We have a lot of talent and material already available in various pockets— with individuals, NGOs and government organisations. A number of workshops may have to be held at local and national levels to identify the possible participants, their areas of interest and to identify the issues arising from our requirements.

What could be some of the features of the proposed science channel? To work that out, we need to ask *What is science?*

And on that basis, work out:

- What should the Science Channel be about?
- What determines viewership?

It is difficult to say what science is. During SITE we developed a credo which said that *science is everywhere*, and it is not the preserve of scientists in laboratories alone. To be effective, the Science Channel must have a clear vision about what it contains and what it could avoid. We will have to work on a fresh credo for the present times.

Two factors which will determine viewership are:

- need gratification of the audience—something we will have to constantly understand and respond to
- production quality—which implies setting standards and maintaining them. Above all, the programmes should be interesting, entertaining and participatory.

What would be the immediate steps to develop the channel?

- Draw upon existing talent and material from a variety of individuals, organisations and grassroots workers
- Hold national, regional and local level workshops to identify issues and topics
- Develop credo, prepare communication briefs, start pilot programme production

Subhash Joshi concluded that an effective Science Channel will require concerted deliberations and actions. This can be effectively done by drawing upon the existing talent and material from a variety of sources including grassroots workers.

This workshop is part of this developmental process. Its objectives include:

- Creating a common platform of stakeholders
- Examining issues holistically
- Understanding viewers' perspective
- Identifying relevant issues

The workshop is aimed at providing a common platform so that thinking and action can be synergised and a broad perspective can be developed. It will also help bringing together perspectives from different regions and different issues so that a holistic vision emerges.

#### What technology now offers and what we can do with it

<i>interactivity</i>	>>>>>	<i>make media people-centric</i>
<i>decentralisation</i>	>>>>>	<i>synergise efforts of NGOs, GOs, individuals</i>
<i>convergence</i>	>>>>>	<i>take end-to-end holistic approach</i>
<i>user-friendly character</i>	>>>>>	<i>high quality content and presentation</i>
<i>sender-receiver blurring</i>	>>>>>	<i>Indian personality</i>

## Feeding the science channel

presentation by Dr. Vinay B Kamble

Dr. Vinay Kamble introduced himself as representing the National Council for Science and Technology Communications (NCSTC), Department of Science and Technology, which came into existence in 1982, and Vigyan Prasar, established in 1989 in a complementary role. The main objective of both is to inculcate scientific temper and to organise science communication activities. Dr. Kamble is Scientist 'G' and Adviser at Department of Science and Technology and Director of Vigyan Prasar.

After giving an account of the past and current activities of NCSTC and Vigyan Prasar, Dr. Kamble gave the participants an overview of the range of science communication activities currently on in the country. He identified several government agencies and NGOs involved in software production, which had the potential to make programmes for the proposed Science Channel.

There is a lot of infrastructure already in place, with organisations like C-DIT, CIET, SIETs, Jamia, IGNOU, EMRCs / AVRCs, and others which have equipment and human resources, committed for making video production.

He also identified organisations holding archives of resources. UGC has about 3000 science programmes, similarly NCSTC has 40, IGNOU and CIET have around 200-400 each. Doordarshan telecasts at least 100 TV programmes on science annually, apart from regular slots like Krishi Darshan. AIR produces about 3 radio programmes every day. Some inputs are also coming from those working with folk media, radio scripts, print media and R&D labs spread across the country.

Despite all the efforts going on for a number of years, it is paradoxical that educated people with a science background lack scientific temper. Dr. Kamble felt that what we need is a society with a spirit of inquiry. Scientific attitude should be inculcated at every level—at

home, office, street, from the lowest to highest functionary, from child to parent and teacher. Special support needs to be provided to programmes that popularise science and technology in regional languages to enable effective science communication at all levels.

Dr. Kamble emphasised that there is a growing need to enhance public awareness on the importance of science and technology in everyday life. The proposed satellite channel for science and technology communication is only one of the means to help in the transformation of our country.

In closing, Dr. Kamble reminded us that in recent years, advancements in biotechnology and information technology have dramatically increased public interest in technology options in a wide range of areas.

Every effort should be made to convey the excitement of science and technology advances to the young. He also proposed a possible mechanism to produce quality programmes to feed the proposed science channel on a regular basis.

Scientific work and policies arising from these advancements have to be transparent and widely understood. We must help to create conditions such that people in India are able to consider the implications of emerging science and technology options, including ethical, moral, legal, social, and economical aspects, which have direct impact on their lives. The proposed science channel should emphasise these aspects.

*We must help to create conditions such that people in India are able to consider the implications of emerging science and technology options, including ethical, moral, legal, social, and economical aspects, which have direct impact on their lives.*

## EDUSAT plan, ground segment configuration and technology

presentation by M. L. Hasija

M. L. Hasija is an engineer by training and an expert on space technologies, working with ISRO since SITE days.

He explained that India has two satellite launch vehicle series: PSLV and GSLV. PSLV takes a polar orbit and GSLV orbit is geo-synchronous. The polar orbit is preferred for remote sensing and the geo-synchronous orbit for communications and meteorological satellites.

GSLV is the most powerful of Indian-made rocket launchers. A satellite called GSAT-1 has been launched with it. However the orbit did not get fixed at the expected height. So, instead of being geo-synchronous at 24 hours per day, the satellite is taking an orbit measuring 23 hours. Technologists would call this a small deficiency. But for applications, this error has major consequences, because the lack of geo-synchrony makes the satellite unusable for communication most of the time.

This is why ISRO does three test launches before finalising a technology. GSAT-2 is due to be launched in a few months and it should be able to overcome the problem of its predecessor. Then in early 2005 will come the turn of GSAT-3 which will be EDUSAT, the first satellite dedicated to education.

EDUSAT has been specially designed to meet the multi-lingual requirements of our country. On EDUSAT, ISRO is deploying five KU band beams on the regional areas. Each of them can carry several channels. It is planning a national beam on KU band and additional national beams on Extended C band.

In itself, this information does not mean much to the programme producer, because whatever the band, or whether the channel is used for entertainment or education, the system parameters are more or less the same.

Today, technologies may be very

complex but their application has been made simple, and most people use devices without thinking too much about what goes into them. However, technology choices have implications for programme reception which have to be thought over.

Once a channel is assigned to a regional beam on the KU band, the signal will not be received in the other regions. Now people speaking a particular language do not all live in the place of their origin. Tamilians in Delhi may like to see Tamil programmes, particularly as they are away from Tamilnadu and want to stay in touch. Going by the region-specific pattern, they would have to be in the southern part of the country to receive programmes in their language.

This is where policy decisions come in. Perhaps the channel or some of its time could be reassigned to the national beam so that some programming in regional languages goes out nationally.

For the technologist, this is a matter of assigning the energy beamed out of the satellite. The total energy is constant but if the energy beamed on a specific region is increased, then the signal is more powerful and the set-up on the ground can be simplified. However, if the energy is diffused throughout the Indian peninsula, then the power received per unit is less and a bigger dish would be needed on the ground to receive it.

If the dish size is increased, the quality of reception improves, and there is provision for interactivity. For example, a dish antenna of 0.75 metre diameter won't offer interactivity, while a 1.8 metre dish not only has capability for strong interactivity, but will also allow fast download of data. Although the higher diameter gives more interactivity by way of return channels, the picture quality even at the lower diameter will be very good.

*Technology choices have implications for programme reception which have to be thought over.*

EDUSAT will use two types of frequencies—Extended C band and KU band. Over the years the demand for numbers of channels has increased, and the C band cannot meet this demand. C band gives only 12 transponders, multiply these by 4, then there are 48 channels in one satellite. In comparison KU band has three times more capacity and has 36 transponders, which will give 144 channels. Because it is such a large system, the cost per unit becomes less.

*based on*  
The best band for Indian conditions (the size of the land mass as well as the heavy monsoons) is the C-band. However, the US wanted to propagate the KU band, and they moved the UN regulatory body, the ITU, to allow transmission of up to 60 db watts in the KU band. Thus, the C band would always have to have a dish antenna of a large size because users would not be allowed to transmit more than 37db watts. In contrast the KU band gives more affordability at the user end, due to smaller dish requirements and easy rigging of the dish locally.

*space*  
Earlier it was assumed that only the KU band could give the convenience of a small dish. But this is not true any more, as with more power being pumped in, even C band can be received with a dish of just six inches. Dish prices are falling because the diameter is decreasing and the parts are very cheap now. Initially they were around 10,000 rupees, but now they do not cost more than 200 to 300 rupees.

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The only expensive item is the receiver, which is not produced here, but if these were to be made in India, the costs would definitely decrease. Roughly 30,000 to 35,000 rupees at present, these would be needed for each set-up on the ground. Add to this the cost of the television set.

One of the main concerns in distribution should be how to take expertise away

from the hands of the experts and into the hands of ordinary people in the rural areas.

If one transponder were used for only one channel, then the power could be high, and the dish could be as small as 0.1 or 0.2 metre. Such a dish can be made by a blacksmith in a village with any conductive material.

As stated earlier, it is a matter of assigning the energy beamed out of the satellite. If the policy planners should decide to put all the power into one channel, the ground segment configuration can be made very simple and inexpensive.

#### Discussion

*asked for*  
Chandita Mukherjee wanted a break-up of the channels EDUSAT would eventually carry. How many hours of programming was to be made? What proportions of it would be national and region-specific?

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B.S. Bhatia said that if the numbers of channels were huge—48 on Extended C-band and 144 channels on KU band, the capacity of the satellite is not a problem as far as he could see, the concern is meeting the need for the huge amounts of software required.

Gauhar Raza wanted to know if the size of the antenna dish is a function of frequency and wavelength.

M L Hasija explained that it is not, because whatever we may gain from the higher frequency in the antenna, it is always mathematically equal and opposite to the loss from reducing the size of the dish.

If we were to consider the issue purely on the basis of technology, the C band would be better for Indian conditions and climate. This is because the KU band is by and large a narrow beam, suited to

*One of the main concerns in distribution should be how to take expertise away from the hands of the experts and into the hands of ordinary people in the rural areas.*

regional broadcasting, while the C band is three times broader. Programme transmission can get disrupted on the KU band during the rains, and to avoid that, one needs to put in extra margins, which ultimately affects signal quality.

Though the C band is better, we have to use the KU band because the C band is saturated.

From the user end, Chandita asked if it would be more economical to receive the picture at one place and redistribute the picture to say, 100 households or would everyone have to invest in their own dish antenna? Mr. Hasija remarked that because KU band needs a small dish, cost-wise it is preferable for users to have their own. In electronics, prices depend upon the numbers manufactured, and as KU band is used the world over, its units are made in millions, and the price per unit being low, we are forced to use KU band. ISRO will provide the necessary margins in satellite power for viewers to get good quality, so quality will be good.

Extended C band and KU band are not interchangeable, so would the users have to get two antennae each to avail of regional and national channels? He confirmed that two separate antennae would be needed.

Vivek Monteiro asked about the future. When there are 78 million TV households out of which 38 million access cable and satellite channels, it means that the cable and DD divide is approximately 50:50 at present. How will the arrival of fibre optic networks affect this? Aren't the number of TV channels going to increase?

He felt that instead of talking about a satellite being available for science programmes, what if we look at it the other way round? What if you have programming ready for a science channel, and want to make use of all the possible avenues to disseminate it—

what is available, and how much does it cost? Is EDUSAT going to be the most cost effective way to reach science programming to rural and other non-accessed audiences?

Mr. Hasija answered that as a rule, the higher the density of receivers, the cheaper terrestrial transmission becomes as a mode of distribution. However, we must remember that the 38 million cable and satellite households are found largely in the western region, so the idea of 50 cable to 50 DD households is a bit misleading. In the rural areas of the eastern region, you may have only 15 per cent of the households with cable and satellite channels, as against some urban areas where up to 90 per cent have cable connections. We can also guess that 80 to 90 per cent of those who do not have a television set today in rural areas, will not own one in the near future either.

In urban areas, fibre optic channels will be cheaper than cable or satellite, and the present cable distribution mode may become obsolete, but this depends largely on investments made by private companies. However, the problem is going to be in reaching out to rural areas, especially remote areas. No one will invest there, nor will users pay for it, so satellites will continue to be cost effective in the rural areas for quite some time to come.

Amman Madan asked for a clear figure on the amount that a user would have to spend to receive the channels offered on EDUSAT. Mr. Hasija observed that as far as satellite resources are concerned, the costs would not be passed on to the users, it would be 100 per cent at the government's cost. The user would have to invest in a TV set and an antenna and some amount of electronics to translate the satellite signal into a TV image. To watch a programme, and use it for internet, ethernet and voice etc. simultaneously from the same set-up

*In urban areas, fibre optic channels will be cheaper than cable or satellite. The problem is going to be in reaching out to rural areas, especially remote areas. No one will invest there, nor will users pay for it, so satellites will continue to be cost effective in the rural areas for quite some time to come.*

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there are costs associated with additional functionalities. The costs would vary and it is not possible to quote a clear figure.

The programmes could be viewed privately or collectively. The dish could be owned privately, or by the school or panchayat or some other local body, depending on who is interested and takes the lead. To some extent, the government would finance distribution of the channel for community viewing so such bodies may pay less than private users.

*Delete*  
*repeated*  
D. K. Bose commented that there are 78 million television sets in our country, of which 38 million households have cable and satellite, out of which only 10 million households are in rural areas in India. He felt that most media in India is urban-centric in content because while various products are available to the whole country, their affordability is restricted to urban users and so the advertising is directed at them, and this advertising *but* drives the choices in programming.

Can we address this inequality in the programming content? What would be the kind of content that can meet the knowledge needs of both the rural and the urban sectors, that can bring them together and not divide them?

He felt that a point made earlier that society has become anti-science is true, but he wanted to add that people are not against the conveniences of technology. If you talk theoretically of science and technology, most people would say "It's not for me!" but if science and technology are associated with daily life, they get interested.

Perhaps *it is* we who have decided that Discovery is a science channel. The people who watch it may be thinking of it as another entertainment channel, interesting in its own way to them. This is why, he felt that we should not call

*capitals*  
this a Science Channel because such a name would spoil it for the audience. We need to remind ourselves that we are not here to impart what we want, but to understand what people want and need, and to give it to them in an interesting way.

Venkatesh Chakravarthy emphasised that we will have to create certain norms, as without some guidelines we cannot identify the contents, types of programmes, formats etc. An overall consensus has to be reached on those norms by all involved with the channel. We seem to be emphasising the natural sciences here, but what about social sciences, or the local knowledge which Satheesh spoke of?

Venkatesh was concerned that science is getting over-valorised in our society. He pointed out that 15 to 20 years ago, if a certain alignment of planets was due, you would find only astrologers commenting on it in newspapers. *when* Recently there was a planetary alignment, all kinds of experts came on television, and a general valorisation of science took place, as if science had all the answers.

We need to make critical inputs about the ethics and politics of science and technology on the proposed channel because without norms one could enter uncritically into extremes where anything goes.

*We need to remind ourselves that we are not here to impart what we want, but to understand what people want and need, and to give it to them in an interesting way.*

*We need to make critical inputs about the ethics and politics of science and technology on the proposed channel, because without norms one could enter uncritically into extremes where anything goes.*

# 3

## WHAT IS THE VIEWER'S PERSPECTIVE?

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- Rapid appraisals of audience needs and preferences in knowledge-based TV programming by participants  
*presentations by Sagarika Golder, Reema Alimchandani, Amman Madan, Aisha Kawalkar, Subha Das Mollick, Gauhar Raza and Surjit Singh*
- A comparative reading of the presentations
- Discussion on making programming to meet viewers' perspectives

*make stylistically consistent in summaries the headlines*

### 3. WHAT IS THE VIEWER'S PERSPECTIVE? Rapid appraisal of audience needs and preferences in knowledge-based TV programming

presentations by Sagarika Golder,  
Reema Alimchandani, Amman Madan,  
Aisha Kawalkar, Gauhar Raza and Subha  
Das Mollick

When the workshop was being planned, we wondered about getting a viewers' perspective into the discussions. We requested several participants who work with young people to each do a small survey on audience perceptions and present it during the workshop. The rationale was that school and college students of primary, middle and high schools would form a major share of the proposed audience group.

Before formulating any strategies we wanted to revisit the requirements and perceptions of young people about TV, science, education and so on. It had to be done quickly, to frame needs and make recommendations for the channel's character and reach. A set of questions were made up and sent around, saying that this was only a suggested format, to be re-contextualised as needed.

Despite packed schedules, everyone who was requested set aside time to do this. We are grateful to them and hope these conversations will give programme makers, education experts and social researchers some exciting leads.

#### Sequence of Questions

1. Do you watch TV? Which channels are your favourites? Cable or Doordarshan? Why? Which are your favourite programmes?
2. What is science? How can knowing about science help in daily life?
3. What is the easiest way to understand science?
4. If you don't understand a particular science problem whom do you go to?
5. Could you tell us about any experiences that you may have had with problems or questions whose answers were difficult to find?
6. Has it ever happened that you found

a particular science topic difficult but after watching a related program on TV you could understand it better?

7. Does watching TV programmes on current issues like pollution, tree planting, drug addiction, HIV etc. give you more understanding than just reading about it? Can you think of any such programmes that you have seen recently? Has any such programme encouraged you to take remedial actions, i.e. planting a tree or preventing a friend from throwing a plastic bag into a gutter?
8. What kind of programs do you watch during the course of the week?
9. What formats do you like? Can you give examples of programmes using such formats?
10. What is your favourite educational programme? What do you like or dislike about so-called educational programmes?
11. If TV programmes were to be made based on your syllabus, what topics and formats would you suggest? That is which are the subjects which you have difficulty with, and need more material on?
12. Do you think some programmes help you enhance your general knowledge, which may help to get you through competitive exams for professional courses? Which ones?
13. Are you familiar with the Internet? What are the websites you visit?
14. Where do you go for information regarding courses of higher studies?
15. If you hear of a coaching class, how do you figure out its worth—whether the fees they ask are worth the quality of learning they offer?
16. What kind of a person would you go to for personal career advice? What qualities does such a person have?
17. If you were to make a TV programme, or a series of them, for yourself and your friends, what subject would you choose? How would you make it interesting?

## A comparative reading of the presentations

The following pages give an account of the six presentations in the form of a comparative reading.

The original survey reports are given in the Annexure at the end of this document. However here, we have derived three broad aspects:

- television viewing habits
- the meaning of science
- themes, formats and treatments

These are followed by some conclusions drawn from each contribution.

### **Rapid Appraisal for Viewer's Perspectives**

by Sagarika Golder

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Sagarika Golder is a professional researcher working in the area of TV audience research. She teaches at SNDT University, and has done a number of projects with DECU earlier. Before this workshop, she was asked to do a rapid appraisal of the educational television scene for the proposed science channel.

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Sagarika presented a rationale for starting a new science channel:

- To encourage a dialogue between science and the general public
- In this process, to build science and technology awareness among the people
- To create a flow of high quality media about science
- Which would enhance a deeper public understanding of science

~~delete~~ She located the objectives of her study:

- To provide an understanding of the viewers' perspective on TV as a medium
- To understand public expectations from media with regard to science communication
- To explore attitudes to various visual and narrative styles in the viewers' minds

- To put forward new formats of science communication

The location: Mumbai

The focus groups:

- School students, age groups 8-12 year and 13-17 years. They were from one premier school (Kendriya Vidyalaya, IIT Campus) and one municipal school (Shivaji Nagar Municipal Primary School in Govandi)
- College students, from a premier engineering institution (IIT-Powai) and ~~the~~ a college (Jhunjhunwala) offering bachelor's degrees in several disciplines
- Working slum youths from Govandi who have given up education but seek knowledge to improve their skills

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### *Some inferences*

#### Television viewing habits

The children from the premier school favoured Cartoon Network, Discovery Channel and National Geographic channels. Programmes on inventions and discoveries, animals, science fiction serials were mainly watched. In addition, the high school students enjoyed quizzes like *NatGeo Genius* and *Mastermind*. Perhaps a part of this was said to make an impression on the researcher. However, since many of these children's parents were on the faculty at IIT Powai, viewing habits may have indeed been as they claimed.

In contrast, both the municipal school children and young women from the slums mainly watched daily Hindi soaps. In fact, a few women college students thought that these represented Indian culture and ideals. They said they enjoyed them for the insights these gave them into the psychology of family life, a phase of life they were on the threshold of. Many young people watched music channels and lastly, news channels.

Students of both the premier college and school and the ordinary college had

?

**We were going to repeatedly find two predominant ideas about science during this exploration: science is rational thinking and science is technology.**

seen some amount of UGC and Zee Education programmes. They complained that Indian educational programmes are boring extensions of classroom lectures. Key descriptive phrases include: dull and drab, not easily understood, lacking practical information, lacking glamour and entertainment. Some wondered why it was so, when the American and British channels could put out so much of high quality material.

delete

#### The meaning of science

We were going to repeatedly find two predominant ideas about science during this exploration: *science is rational thinking* and *science is technology*.

found.

An overwhelming number of the premier school students thought science was all about discoveries and inventions, it helped rational thinking and elevated the standard of living. However, for the students of a municipal school, science was another subject at school, and if they linked it to life, they equated science to technology. The working class slum youths see science primarily in terms of practical applications and career opportunities.

Another truism we encountered repeatedly was: *Science is boring, but useful in daily life*. All the students felt that science was boring and not taught in an interesting manner. However, the premier school students were able to give some examples of the practical uses of the science they had learned, like finding lost keys in grass using a magnet. For the slum youths, it was the importance of balanced diet, awareness of issues like environmental cleanliness, and prevention of diseases, which would improve their daily lives.

When it came to problems of understanding science, the junior school students went to their teachers or parents for help with their problems, while the college students referred to books and Internet.

We were pleasantly surprised to find that to some extent, social awareness brings about remedial action. Some school children stopped bursting crackers because it caused pollution and promoted child labour. Many students had stopped throwing garbage "here and there" and claimed to plant trees periodically, and one of the students made shopping bags for his mother out of old newspapers.

The slum youths found the AIDS awareness campaign with the character Balbir Pasha very effective. They said that at first they were intrigued to know who Balbir was, a Sikh or a Muslim, then as the campaign went on, it became obvious that he was "apun sab log".

#### Themes, formats and treatments

The students who regularly turn to TV for infotainment wanted programmes giving practical information, presented with humour and emotional appeal.

Cartoons, docudramas, quizzes were the main formats that appealed to respondents from all the groups. Programmes shot at outdoor locations and demonstrations of experiments interested them more than studio-based discussions.

The children from the municipal school found the serial format effective for its emotional appeal. "I would make people laugh and also cry a bit" said one 8<sup>th</sup> standard Municipal school boy. They wanted programmes with practical information about daily life, made lively and entertaining.

#### Conclusions

The respondents from various groups see programmes on science providing useful, practical information. However, the presentation had to be inviting and appealing for them to watch it loyally.

One of the important observations repeatedly seen through the study (see Annexure) is that career counselling is a big need through all classes of society.

not relevant here or define

**To some extent, social awareness brings about remedial action. Some school children stopped bursting crackers because it caused pollution and promoted child labour.**

While vocational and professional options have increased in recent years, students depend either on parents or teachers (who are not aware of the latest) or on peers for direction.

This complaint ranged from the premier college students who had been forced to take the IIT entrance exams, just because they happened to be good in science, got in, and now wished they had studied architecture or archaeology instead—to the slum youths who had dropped out after the 8<sup>th</sup>, wanted technical training of some quality, were even willing to pay for it, but had no options and had to end up as chhokra-boys in garages (or other such menial positions) waiting to be made apprentices, if luck favoured them.

This leads to a recommendation that the proposed science channel must feed this need for career guidance. It should aim for realisation of the special qualities and aptitudes of each individual, especially gifted individuals in economically depressed circumstances.

The bright sparks of tomorrow are there in our villages, perhaps even geniuses like Ramanujam, who are denied the space to flourish. Given the interactive possibilities of satellite communications, it seems much more possible than ever before to encourage recognition of the gifts of such special children and to open out opportunities for all children.

#### **Rapid Appraisal for Viewer's Perspectives**

*presentation by Reema Alimchandani on behalf of SNTD students*

This survey was carried out as a classroom exercise by students of the Post Graduate Diploma in Communication and Media, SNTD Women's University. Mira Desai, Reader at the University, introduced the presentation.

The location: Mumbai

The focus groups: three groups of students from middle & upper class

families whom the investigators knew:

- 8-12 years
- 13-17 years
- 18-25 years

The sample size: 100, all had TV sets and cable connections and watched the full range of 30-40 channels

#### *Some inferences*

##### Television viewing habits

Many of the students watch Discovery, National Geographic channels, not out of interest but on the insistence of their parents. They hardly ever saw DD, unless it was a live programme with exclusive telecast rights such as a test match. As for other cable channels, the students show varied preferences.

##### The meaning of science

The survey does not directly explore how students perceive science, their understanding, or if they feel a need for an educative channel. However, the authors report that when it comes to using media for knowledge seeking, Internet is the first choice followed by books. Older students would appreciate programmes offering career guidance. Some children in the age of 8-12 years had queries in science and felt that a channel should cover syllabus matter.

##### Themes, formats and treatments

The students recommend that programmes should not be overtly pedagogical but informal. They should not be restricted to the studio. Overall, they should be crisp and well presented, with lots of animation and graphics. Interesting formats like dial-in, talk shows and quizzes could increase audience participation. They wanted a wide range of subjects, including wildlife, the latest advancements in technology and genetics.

##### Conclusions

This group wanted the channel's publicity campaigns to rope in experts and celebrities to create a buzz about its

*Career counselling seems a big need through all classes of society. While vocational and professional options have increased in recent years, students depend either on parents or teachers (who are not aware of the latest) or on peers for direction.*

features and quality. They suggested the main message to be promoted should be *TV for problem solving* to attract viewers. They also wanted the authorities to ensure excellent quality of transmission, for this was partly why DD was shunned.

### *Perceptions of science education on TV in Hoshangabad District, M.P.*

by Amman Madan

Amman Madan is with the voluntary organisation Eklaya, which works in school education in rural Madhya Pradesh. He is interested in the public understanding of science, technology and related issues and runs a series of village libraries in Hoshangabad District.

The location: Villages and the district headquarters of Hoshangabad

The focus groups:

- Male college students in Hoshangabad town, Hindi medium background
- Village school students from landless labour backgrounds including adivasi and harijan children
- A government girls' school with students from better-off families
- Privately run school in a village with students from families of small and middle farmers
- Affluent farmer families

Some inferences

#### Television viewing habits

Viewing patterns depend completely on availability of channels anywhere, but in rural areas the number of choices are further restricted. In Hoshangabad District, a relatively rural prosperous area, almost everyone, except the very poor, have television sets. Amman found that 90% of the landless labourer households had black and white television sets, which has implications for producers making programmes

especially in the design of graphics.

Yet the choice of channels was not that much. Of the three villages where the survey was conducted, two had cable operators showing only free-to-air channels. DD1, DD Metro, Sab TV, and Zee TV were shown in the two bigger villages, while the smaller village had to do with DD1 & Metro. Star Plus, Star News, FTV and Discovery were available only in Hoshangabad town. Sanskaar, a religious channel, was watched the most in the villages.

Television was watched primarily for entertainment. Excepting for the older college students, television viewing was seen by most as an enjoyable diversion, not connected with everyday life or its problems.

Discovery Channel seemed to be popular among the older boys in town, who showed interest in investigative and exploratory programmes like *FBI files*, *Angkor Wat*, *Mummies* amongst others. The noon telecast of Discovery on DD seems to be popular even with the farmer families who reported that they had watched programmes on aquatic animals, ancient forts, and evolution of humans.

#### The meaning of science

The primary school children in some of the villages are not even familiar with the term *vigyan*, as they have not yet studied science as a separate discipline. In middle schools, science is equated with knowledge, what the students read in their textbooks, still not that connected to daily life.

For the older boys in town, *science is experimentation*, a search for facts and the dispelling of myths. We see the *science is technology* theme here too. Many students, regardless of their backgrounds and schooling, do not distinguish science from technology, because science to them is about the discovery and invention of new things.

*In Hoshangabad District, a relatively rural prosperous area, almost everyone, except the very poor, have television sets. Yet the choice of channels was not that much.*

class

delete space

Themes, formats and treatments

Amman reported that drab schoolbooks, dull themes combined with poor teaching and a forced learning system, was limiting the school children in the villages. He recommends playing about with children's sense of wonder. Programmes about the stars, moon, nature and animals were some of the preferred themes among students from different backgrounds and age groups.

In schools where teachers shared an enthusiasm for science with students, there was a clearer response. Themes like *Why do stars twinkle?* seemed to capture their imagination, and many students wanted programmes on such topics, that aroused their curiosity.

Programmes on evolution of humankind, magnets, origins of agriculture, the Seven Wonders of the World were the other themes thrown up in the discussions, possibly based on their own exposure to television.

Older boys were excited and intrigued by the use of science to resolve mysteries and paradoxes. Another preferred theme was control of the technologies of daily life and experiments.

Not many wanted to know how things work, perhaps due to their limited knowledge and exposure to technology. Yet on probing, the students showed a desire to understand the relevance of technology in their lives.

The students also wanted programmes on subjects like the actual use of the Vernier callipers and screw gauge, as they had only seen these being employed in an experiment, but had never handled the instruments themselves.

Conclusions

It seems clear that science education programmes that educate while entertaining would fill a very important gap in our education system. They would

correct to at least some extent the apathy or even distaste for science, which the ordinary, dull, school-going experience creates.

The programmes should stimulate and satisfy their sense of wonder. As Amman Madan puts it, "There would seem to be at least three major notions of the meaning of science education: a passive absorption of facts notion, an active wondering, curiosity-based model, and an active interactive, experimental model. There is, therefore, space for exploring how to convey the scientific method itself through this medium."

Science is learnt by doing. One cannot cycle by watching someone else do it—one has to try it oneself. Hence, we should show programmes with interfaces that facilitate viewers in the real world, to make that knowledge their own.

Science is an equalising force in human society and this aspect of it should be acted out and shown in practice.

Amman recommended that the channel should consciously work to legitimise local knowledge. While making programmes, we need to consider the philosophical basis of science. Simultaneously, we should enter into dialogue with other forms of knowledge.

The programming should leave behind the formal institutional formats that science and technology are usually presented in. We have to bring out that there are competent indigenous ways to handle the material world.

However, these should not be taken uncritically at face value. The programmes should also examine the logic, structure, empirical and social verifications of that knowledge. Science means scepticism, and if we do not question what we do, then the essence is lost.

ourselves,

*Science is an equalising force in human society and this aspect of it should be acted out and shown in practice. The channel should consciously work to legitimise local knowledge.*

→ Not done till Pg. 52.

*There would seem to be at least three major notions of the meaning of science education:*

- a passive absorption of facts notion
- an active wondering, curiosity-based model
- an active interactive, experimental model.

*There is, therefore, space for exploring how to convey the scientific method itself through this medium.*

**Rapid Appraisal for TV viewers' perspectives**  
by Aisha Mahadeo Kawaikar

Aisha Mahadeo Kawaikar is working as a Project Assistant on Alternative Curriculum Development at Homi Bhabha Centre for Science Education, a part of the Tata Institute of Fundamental Research. She approached schools she is familiar with in the course of her classroom observation work, as well as some other groups whom she assembled for these discussions.

For her survey,

because and she assembled

When it came to the sources through which they understand science, almost everyone across the groups mentioned experiments in their responses.

- The location: Mumbai  
The focus groups: Boys, girls, men and women from different backgrounds
- Students between 8-12 years from low socio-economic status (though higher than its neighbouring municipal school)
  - Students between 12-15 years from middle socio-economic status
  - Students between 12-15 years from high socio economic status (with their parents having sound technical & scientific knowledge)
  - Undergraduate students of biotechnology and computer sciences
  - Young working professionals

Some inferences

Television viewing habits

Overall, the groups prefer cable channels to DD, saying the latter is dull. Cartoon Network, Animal Planet, Discovery, National Geographic seem to be the favoured choice of channels. The students from a lower socio economic background specifically spoke of Sahyadri, the Marathi DD channel, and the Homi Bhabha Programme on it (the researcher herself was from the Homi Bhabha Centre For Science Education) and daily Hindi soaps.

Favourite programmes range from *Aryamaan*, *Discovery Kids*, to horror serials like *Aahat*. Girls like programmes on underwater, nature, while boys distinctly went for programmes on space

Life and subject like

However the girls preferred

explorations and new technologies like surgeries done by robots.

The college students and the working professionals go for news and sports channels besides other entertainment channels.

The meaning of science

Students between 8-12 years from a low socio-economic status had responses like *science is about knowing things by experimenting*; it is about not believing in superstitions; and here again, for many students *science is technology*. Students between 12-15 years from middle socio-economic status believed science helps you maintain good health. Students between 12-15 years from high socio economic status felt scientific inventions made life easy, but sometimes science can be destructive. Both the college students and working professionals felt it is the study of things around us, and that *science cannot be separated from life*.

When it came to the sources through which they understand science, almost everyone across the groups mentioned experiments in their responses. For some problems, the students look to teachers and parents for their answers. The college students and the working professionals said they look up the Internet.

Across the groups most

search

Interestingly, this is the only survey where the respondents, across various age groups, have shown interest in science programmes on TV. In fact, they recalled programmes that helped them understand particular topics. *How Bulbs Work* on the Homi Bhabha Programme, *Static Electricity* and *Robotics* on UGC, *DNA finger printing* on Discovery, amongst others. *Earth Matters* on DD, *Balchitravani* on Sahyadri are among other programmes they like to see.

College students felt UGC programmes were dull and unimaginative but they

bear them because they are informative. The school students felt that UGC programmes should be more child-oriented, a hint UGC might like to take, since their timing is more suited to school children than college students.

Does awareness bring about remedial action? For some, such programmes only bring about awareness but do not inspire them to take action. Several mentioned a programme called *Jasoos Vijay* on AIDS that was very informative.

Using jute bags instead of plastic, optimum use of paper, and not littering the road are a few practices many claimed to follow. However, the college students said one person couldn't make a difference, there had to be a collective behaviour change.

#### Themes, formats and treatments

The students would welcome imaginatively designed programmes taking off from their curriculum. They wanted interesting hosts with a sense of humour and explanations to be aided with clear graphics. Programmes based on school subjects should be interactive, so kids like themselves could go and take part.

Although most students gave ideas they are already familiar with, as suggestions for programme subjects, they are deeply interested in recent developments in science. There was a demand for knowing more about what they don't know anything about.

#### Conclusions

Clearly there's a need for syllabus based programmes, but they should involve the student, and be participative.

Secondly, audiences should be familiarised with new media through television. Most of the school students had heard of the Internet, but could not explain its uses, and it may be pointed out that these schools are in Mumbai.

### **Rapid Appraisal for Viewer's Perspectives for the proposed science channel**

by Subha Das Mollick

Subha Das Mollick is a teacher of media studies at St. Xavier's College, Kolkata, also working with EMRC, Kolkata. Her senior colleague Gaston Roberge (who was to have joined us at the workshop) requested her to do a rapid appraisal with the students immediately accessible to them in the College, using the same set of questions as a basis.

The location: Kolkata

The focus groups: students of Humanities, St. Xavier's College

- Group 1: five students, age 19. Family income Rs.50,000 per month. Average 4 hours of TV viewing daily.
- Group II nine students, age: 20, 21. Family income Rs.25,000 to 30,000 per month. Average 4 hours of TV viewing daily.

#### *Some inferences*

##### Television viewing habits

This seems to be the most affluent and well-exposed group of all the students met by our various researchers, and in some ways, the most bored.

Cosmopolitan in nature, with access and exposure to different channels, they watch largely English programmes like on Channel V, Star World and HBO. They seem quite dismissive of DD, unless it is showing live cricket matches. They also watch Animal Planet & National Geographic Channel, only if the programmes are not long in duration and the subjects are of interest to them.

##### The meaning of science

Some students responded from their own experience of studying science at school. They were emphatic that science cannot be taught without a good teacher. They found science tough in their school days because the fundamentals were never taught properly,

and television <sup>other resources such as</sup> ~~never~~ <sup>were not there</sup> came to their aid to make their understanding ~~any~~ easier.

They recommended including subjects of school science in TV programmes. They also wanted such programmes to be seen in class, <sup>and not separately at home</sup> as a part of the classroom experience. In addition they felt syllabus based programmes should be shown just before major exams. However, the duration had to be less than 30 minutes.

Their view of using the internet as a study aid, <sup>one feels was much</sup> was that it contained a lot of trash and it was difficult to sort out the contents. Therefore, they wanted TV programmes to be streamlined and made crisp and interesting.

#### Themes, formats and treatments

Their main suggestion was that "Let it be anything, but make it interesting!" A case of form over content, it would appear. They wanted engaging programmes, visually arresting, with minimum talking. The programmes should use simple language, arouse curiosity and be humorous.

#### Conclusions

Being well exposed to media, and some of them are would-be media makers themselves, these college students look for programmes that can grab their attention and keep them entertained.

Given the choice of channels, their attention span is also very short-lived, and they seem to be impatient with anything that requires a complex explanation. Perhaps, <sup>the</sup> students <sup>had</sup> appeared to have a lukewarm response towards a science channel as they were from the humanities stream.

It may also be that their tendency is to put all knowledge into relevant / irrelevant compartments, and not to burden themselves with more than they need to get by with.

In closing, Subha writes that she showed a BBC programme, *Fermat's Last Theorem* to both the groups. Everybody

watched it engrossed and came up with good observations about the structure of the programme and why it works so well. Yet except, <sup>my</sup> just one student, <sup>left to themselves</sup> everyone said that they would never bother to see the programme on TV.

#### A pilot survey among children for proposed educational channel by Gauhar Raza and Surjit Singh

Gauhar Raza and Surjit Singh work at the National Institute of Science Technology and Development Studies (NISTADS). They have worked on issues of public understanding of science for several years. Gauhar Raza presented the work.

The location: New Delhi

The focus groups:

- 32 students from a premier, upper class school, Springdales School, Dhaura Kuan, New Delhi
- 39 students from lower economic stratum, Government Secondary School, Mangolpuri, Block-C, New Delhi.

Family profiles:

- The fathers of the government school children were either self-employed small vendors and if employed, they were mostly peons or in similar positions. The fathers of the <sup>of</sup> private school kids had their own businesses (like) management <sup>such as</sup> consultancies or were officers in government and the private sector.
- 94% of the mothers were housewives.
- None of the government school kids' mothers had studied beyond 12<sup>th</sup> standard.
- Family size has implications on the selection of channel watched, and scope available for the child to choose a programme. If there are many people in the family with clashing demands, then the male head of the

by students together

evoked mixed feelings to

of speech

seems appeared had the idea of a

Given the choice of channels, their attention span is also very short-lived, and they seem to be impatient with anything that requires a complex explanation.

#

family holds the remote control.

- Children of the two schools live in different cultural, social, economic and linguistic worlds.

Sample size: 71

#### Some inferences

This particular survey (see Annexure) offers quantitative answers to most questions. Barring a few qualitative responses, the following inferences may not offer a clear picture of the viewers' perspectives.

#### Television viewing habits

The students from the Government school largely view Hindi language based entertainment channels, but a fair number are watching Discovery Hindi.

This is in contrast to the media viewing habits of students from the premier school, who seem to veer more towards edutainment channels like Discovery and National Geographic.

Both groups indicate a preference for educational programmes over entertainment programmes. This, as all the researchers pointed, must not be taken at face value. It has to do with the conditions of the experiment.

The favorite channels of the private school student were Star World and Discovery. Popular programmes, named included were Full House and Ripley's Believe It or Not. Among government school students, Star Plus and Zee were popular, and Sonpari was a favourite.

21 favourite channels were reported by government school students, while 24 were named by private school students. 13 channels of these were common, but only 5 programmes were common. The survey does not name these 5.

The government school students were not exposed to internet at all. Private

school student reported visiting 41 sites. The most popular sites were Google, which was far ahead of the others, followed by MSN, Yahoo, Hotmail, AltaVista and ESPN. It appeared that search engines, rather than any particular site seemed to hold sway. were attracted this group

#### The meaning of science

Most students from both the groups gave bookish definitions of science. They do understand it as the study of the how and why of things around us, and it is knowledge based on facts, but their approach is formal.

Most respondents felt that by performing experiments and putting science to use in daily life, one understood it better.

When faced with a problem in science, students ask their teachers, followed by parents. However, among the government school students, the parents contribute little to the child's education owing to their lack of formal education.

Both the groups show an enthusiastic response to the idea of science though television programmes. Compared to books, they feel television programmes would increase their awareness.

However, as the authors of the survey point out, communication of science is a cultural process, and no worthwhile communication of science can take place unless it is contextualised to the particular audience.

For both groups, Discovery Channel programmes are a source for enhancing their general knowledge. Bourn Vita Quiz being in English had an audience only among the elite school students. This group was also familiar with the Internet, often exploring career options.

In contrast, the government school students would go by their parents' and teachers' advice on higher studies and career choices.

**Communication of science is a cultural process, and no worthwhile communication of science can take place unless it is contextualised to the particular audience.**

**The Science Channel must bear in mind the differing needs of children from varied backgrounds while developing programmes.**

**They may design separate channels for different groups, or choose to go with those who get less from the current media environment.**

Regarding social awareness bringing about remedial action, a large percentage of students have been inspired by awareness-raising programmes. However, there is no telling evidence of the nature of actions taken by them...

#### Themes, formats and treatments

All the students would welcome programmes explaining items in their curriculum. They would particularly like programmes in literature, science and social sciences, employing both drama and documentary formats.

When asked about the kind of programmes they would make if given a chance, the responses are very different. The students from the premier school would choose science, while government school students would rather go for subjects other than science.

#### Conclusions

As the two sets of students came from contrasting backgrounds, it would be obvious that their needs are dissimilar. The Science Channel must bear in mind the differing needs of children from varied backgrounds while developing programmes. They may design separate channels for different groups, or choose to go with those who get less from the current media environment. Yet it is interesting that a channel like Discovery, thanks to its Hindi language version, commands an attentive viewership in both the schools studied.

With the potential for interactive media that this channel will have, it would be necessary to educate students who do not have easy access to computers about Internet before we can talk of convergence.

Gauhar was of the opinion that no clear-cut conclusion can be drawn from this survey, and a larger national survey needs to be done. The questionnaire should be designed to be sensitive to the respondents' cultural and socio-economic conditions.

#### **Discussion on making programming to meet viewers' perspectives**

The presentation on viewers' perspectives had participants sharing their responses and experiences in audience-watching. At the same time, the self-introductions and voicing of concerns continued in this session. Participants took turns to address the group.

TV is a family activity  
Shailaja Bajpai mentioned that she had worked on a book that dealt with the impact of advertising on children in 1989. Many of the findings about children's patterns of TV viewing reported by the presenters are similar to what she had found then.

She wanted to draw the group's attention to the fact that children watch a lot of television in the company of their families. She emphasised that this is something that the producers must keep in mind. The programming has to hold the attention of every child. Also, she felt children do want information, but the way you make and present the matter counts more than the strength of the ideas dealt with in a programme. Things have to be conceived within the framework of the medium of television and not everything can suit the medium, because it has its own limitations.

Viewing is a habit  
Sunil Jacob reminded the group that when Discovery was first launched viewership was very small. Despite that, National Geographic Channel came in. Today there is a sizeable viewership for both. Perhaps such things require a length of time to take off.

We have termed these as educational channels, but viewers watch it as entertainment. Perhaps it takes time to build the habit of seeing such material. As the audience in the town of  
Surajit Sarkar shared his experiences at Pipariya in Madhya Pradesh where he interacted with an enthusiastic group of local people who wanted to start a programme for the local cable network.

During a brainstorming session on possible programmes, local children focused on practical, day-to-day knowledge. One suggested that they show various games children play while a teacher is taking a class, without the teacher ever knowing what they are up to. Other suggestions: a bus ride, Chetvaha yatra (local migration), how to solve crosswords, local event reporting and histories of the different neighborhoods of the town.

The children also insisted on going to locations to shoot. If there is a programme that shows places the viewer can never visit, it becomes very interesting. TV programmes can also show new and different ways of seeing the same things we see everyday.

*Do science and art go together?*

Amman Madan responded with a basic question—does science lend itself to being communicated in the form of entertainment, and how much science can we actually teach this way?

Part of the whole process of learning science is moving from argument to argument, checking that no mistakes are made on the way. Thinking rigorously about something is hard work. What are the limits television places on this?

Satheesh felt that humour, song and dance all have a bearing on learning. A more fundamental issue is that of respect for the spectator. Our aim should be to create lively, stimulating and simple programmes. TV programmes sometimes look artificial because producers try to display their technical skills rather than communicating something to the audience.

Nitin Bhavsar pointed out that the perception of what is entertaining is different with different audiences. We have to see if the content holds the attention of the intended target group, rather than just seeing if the programme is entertaining in itself.

Chandita offered that you possibly need something akin to entertainment, but it should be something which causes wonderment, is eye opening and arouses interest, what the Natya Shastra calls *vismaya* among the *navarasas*.

While video-recording Sagarika's interactions with various sections of students, Chandita said that she found the ease and curiosity with which the students of a so-called run-of-the-mill college responded <sup>to the questions</sup> a contrast to the attitude of the elite students, who appeared focused on their careers and had little time for anything else. In fact when it came to making suggestions and letting their imaginations play, the so-called brilliant students seemed dull and stressed out.

If we are to do anything, it should be to wake up the sense of wonder and excitement natural to all human beings. Present day education suppresses this excitement, by making children think that success is about pressing themselves into moulds.

Sagarika wondered if entertainment could be married to science. She found that science fiction movies and books were liked—for example, someone cited Robin Cook's *Coma* as an example of how they learned some science while reading a thriller. Programmes like *Quest* and *Turning Point* were appreciated so many years later because they focused on everyday things.

In her discussions, she had come across students wanting to see films about how a needle is made, or how crayons or lenses are produced. If we can begin from their questions, could we not achieve both entertainment and science communication successfully?

Chandita added that underlying our programmes must be a sense that the method of science is not infallible, that

**Part of the whole process of learning science is moving from argument to argument, checking that no mistakes are made on the way. Thinking rigorously about something is hard work. What are the limits television places on this?**

**If we are to do anything, it should be to wake up the sense of wonder and excitement natural to all human beings. Present day education suppresses this excitement, by making children think that success is about pressing themselves into moulds.**

Changes below

are not born that way

The sponsors are not interested in consumers who don't have money, and so programmes are not produced for such viewers, and they are not visible on the TV screen.

there is no one "correct" ready-charted way to go about scientific enquiry and that there are no born geniuses—they usually work quite hard for their achievements.

We must be able to bring out the narratives behind discoveries—the doubts, the false leads, the trial runs, the collaborations and inspirations from other sources, the fact that the story is continuing to unfold even now as we speak.

things be censored out. That may not be acceptable to the community gathered here. So Gauhar hoped this issue would be discussed later, and whichever way we decide to go, we should stick to it as a policy and not be ambiguous about it. with conviction

S. R. Joshi then introduced Prof. E.V. Chitnis, the man behind SITE who had just arrived from Pune, and thanked him for the effort he made to reach the workshop in spite of health problems.

The National Channel Prof. Chitnis shared his thoughts with the group. At the outset he wanted to say that he felt he was at a disadvantage because he had a lot of experience, and experienced people tend to think they know everything, which is dangerous.

The role of advertising on the Channel

Gauhar Raza reminded the group that most programmes on the popular channels are shown in bits between commercials. The viewing experience is not so much about the supposed subject of the programme, but about the commercials.

Advertisers dictate the contents of channels because they need to reach their target consumers. If they back a channel, it has to take on an identity that gets them that segment efficiently.

The sponsors are not interested in consumers who don't have money, and so programmes are not produced for such viewers, and they are not visible on the TV screen, despite their large numbers.

Yet here we are trying to create a channel for a section of society that probably doesn't have the kind of spending power that would attract an advertiser, even if the numbers are large. This brings up some problems.

Gauhar felt that Right from the beginning we should have an understanding that the channel is not coming on air for commercial reasons, and that it should not be compelled to satisfy any TRP ratings or sponsors to establish itself.

If we make a provision that the channel must be commercially viable, in order to be strong—as several people here are suggesting—degeneration could take place for these very reasons. Tomorrow

We may have problems due to a contradiction between our aims and those of our sponsors. They may insist that certain things be included and other

He understood that we need to make some good science programmes, but he wanted to know who the programmes are for. If these are for audiences living outside the big cities, then we have a great handicap, for most of us do not know much about their lives. However, if this drawback is recognised by everyone, then we have a good chance to succeed. Because the knowledge of a shortcoming always opens up exploration and experimentation, we are not made complacent by the idea that we have all the answers.

To do something outstanding, Prof. Chitnis thought it was essential to have an open mind and an ability to dream. Long before there was any Indian space programme, as a young person in the 1950s, he had had the privilege of dreaming about it, with one of the greatest dreamers India ever produced, Vikram Sarabhai. Everything had to be created from scratch because no other country would give away the technologies and knowledge needed for a space programme, and the team had to do it for themselves. There was great learning in that.

Prof. Chitnis expressed his despondence

the audiences who are not do not spend significant money

those who are not

Because the knowledge of a shortcoming always opens up exploration and experimentation, we are not made complacent by the idea that we have all the answers.

about the poor state of education in the country. What is the knowledge base that we take as given, that all students of a particular age all are supposed to have? With such unevenness of quality of education in different sectors of the society, how do you teach science to students through TV? ~~This is a very big puzzle that this channel should consider.~~

Yet despite the problems, what keeps him optimistic are his visits to various places where individuals are doing good work, and his repeated exposure to students doing wonderful things through informal channels of science education. He hoped the new channel would let children ~~learn~~ <sup>appreciate</sup> science simply by showing what science and technology do for society.

Prof. Chitnis wanted to make a distinction between the Human Resource Development Ministry's plans of teaching science at a formal level and what he hoped this channel would do. He reminded us that we are looking at real, living, people, who have no connections with the Ministry or any institutes of science. Our project must have scope for these people to tell us what they want.

The structure supporting this channel should be built as a virtual organisation, where there is no bureaucracy and everyone feels strongly for what is happening. He hoped this would be a participatory, autonomous, non-bureaucratic, decentralised organisation, with its constituents dispersed all over the country, keeping in constant touch through satellite communications. The advantage of such a structure is that people who are outside the bureaucratic framework could contribute creatively to it. And this kind of creativity is what he is looking forward to, what he is calling the Virtual Channel.

*Spontaneous concepts in science*  
Jayashree Ramadas introduced herself, saying that she has always been intrigued by television's potential as a

medium of education. Her work at the Homi Bhabha Centre looks at the interactions between teachers and students in the classroom. She has studied how teachers administer both the regular curriculum and the special curriculum prepared by the HBCSE. Her work is concerned with how teachers <sup>inter</sup>act with students, and what is it that excites and provokes the interest of students?

Jayashree has also been concerned with the ideas student have about science, that is, their spontaneous conceptions. She has found that the science of the textbooks often goes completely contrary to what students actually think. The students learn the former to pass exams, but hold on to the latter in their own thinking, and there is a huge gap between the two.

What are these spontaneous ways of thinking? How different is children's thinking from that of adults? Can we characterise this way of thinking more broadly, into the worldviews that children have about natural phenomena?

She hoped the new channel would look particularly at the students who don't have a background of formal education at home and do programmes for them. The challenge lies in developing programmes that stimulate the thought processes of such students.

Jayashree proposed a checklist of values and perspectives which should inform science programmes. It is given on the next page in the form of a tree of knowledge.

*Reaching science everywhere*

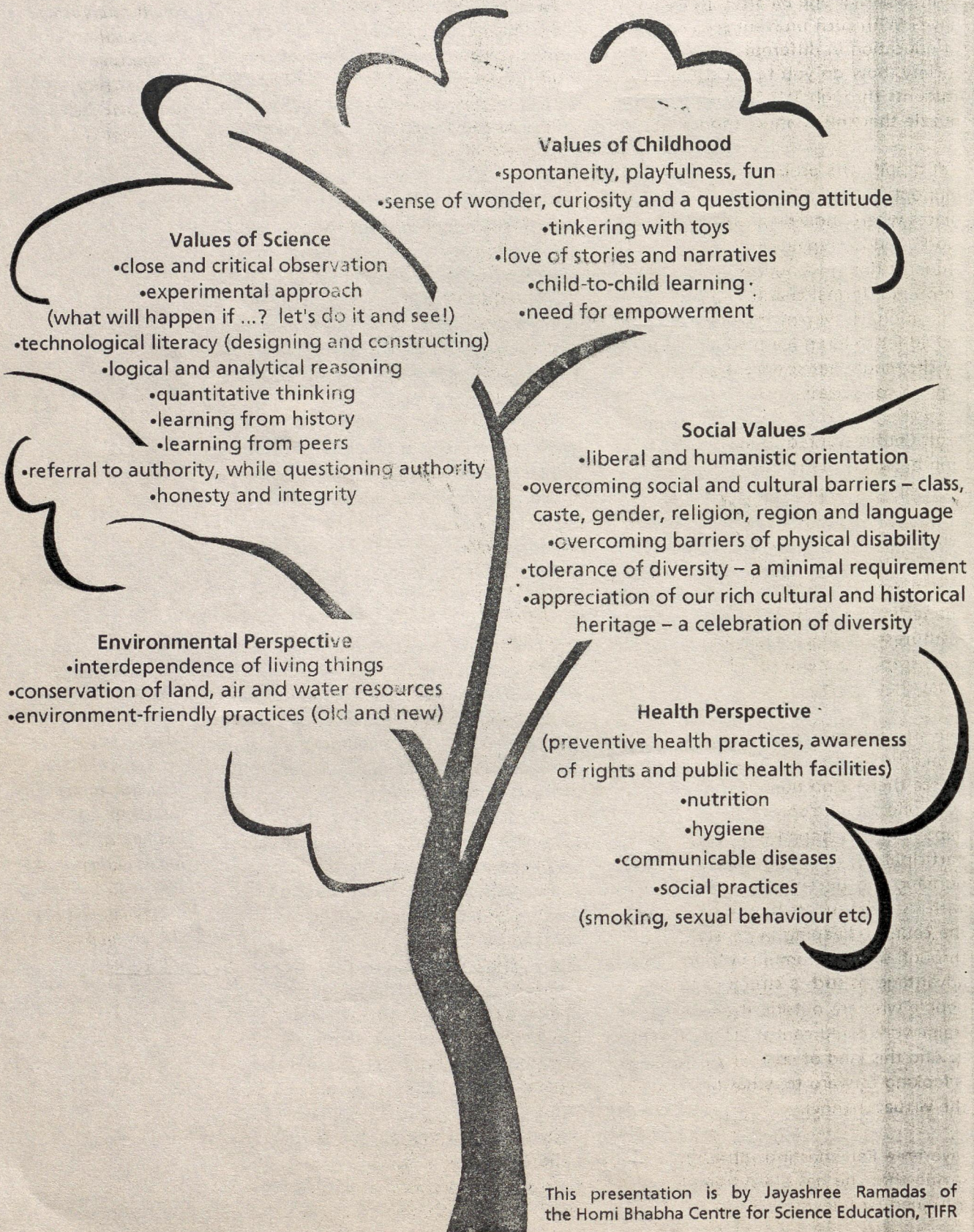
Meher Engineer introduced himself. A physicist at Bose Institute, Kolkata. He is involved with a number of science communication activities. These include training middle school teachers in a rural school in West Bengal, working with NCSTC for their Children's Science Congress programmes and giving talks. He has his own phone-in science

*The structure supporting this channel should be built as a virtual organisation, where there is no bureaucracy and everyone feels strongly for what is happening.*

*The science of the textbooks often goes completely contrary to what students actually think. The students learn the former to pass exams, but hold on to the latter in their own thinking, and there is a huge gap between the two.*

## VALUES OF SCIENCE EDUCATION

This is a proposed checklist of values and perspectives which should inform the activities of the Science Channel. They are recommended for embodiment across all programmes of the channel.



This presentation is by Jayashree Ramadas of the Homi Bhabha Centre for Science Education, TIFR

programme on FM radio, and, he is developing an interactive museum based on the work of JC Bose.

Meher felt that interactive programmes with hosts who can facilitate hands-on activities could generate a lot of interest. Organising such a channel would be quite a task, but he is excited as he feels that there is a great future in communicating science at all levels from kids to senior citizens.

*Legitimising de people's knowledge*  
P.V. Satheesh said that he had worked with media for twenty years as a producer with Doordarshan. In the mid-80s he left that to start the Deccan Development Society. Now his main work is with 5000 Dalit women living in arid, drought-prone conditions rural Andhra Pradesh. Over the years he has come to understand the enormous amount of agricultural knowledge that these women have. They have developed these concepts and techniques over generations, in a very difficult environment and he finds it fascinating.

This is a globalised world where no border is sacred any more. Under such circumstances, the only way such people can keep their dignity is if they can build capacities for resistance. This has to happen in their villages or in their farms, within their knowledge systems.

Knowingly or unknowingly the wider society has de-legitimised the traditions of people's science, and does not recognise its value. This is a chance to take some corrective action, by legitimising this science, by bringing it out to millions through satellite TV.

Media is supposed to be a part of democracy, but it excludes certain sections from its purview and in that way suppresses their voices.

*The Science*  
Our channel must have a condition of deliberative democracy in which we consciously pick excluded voices and give them a forum and a space.

Science is knowledge and what we are engaged in is production of knowledge. Then why is it that we create knowledge hierarchies where people are at one place and science is elsewhere?

Satheesh asserted that people know science and they have the same kind of authentic vibrant knowledge which scientists work from. He wanted to see programmes where no scientist ever explains anything to farmers. Rather, we should see farmers explain things based on their observations, and the scientists listening and learning from them.

Amman Madam cautioned that when we say people's science, we have to be careful, because not every local knowledge system is science. They are usually the outcomes of repeated experimentation and observation and are therefore contextual. This is why local knowledge systems often do not survive in different situations.

*Wrap up*  
The day ended with a screening of a ten-minute film made by Chandita as she followed Sagarika's discussions with various youth groups. The presentation seemed to reiterate that there is a very receptive audience out there, assessing everything they see quite closely, and it is upto us to put another kind of culture into their hands.

*It is a challenge to move into this empty space for a knowledge culture is an unique challenge*  
Small groups were proposed after this and choices of various modalities for their work were discussed. It was decided that the groups would meet the next morning and work towards concrete recommendations related to the proposed Science Channel.

*People know science, and they have the same kind of authentic vibrant knowledge which scientists work from, but little addresses their sense of world to move into this empty space for a knowledge culture is an unique challenge*  
Knowingly or unknowingly the wider society has de-legitimised the traditions of people's science, and does not recognise its value. This is a chance to take some corrective action, by legitimising this science, by bringing it out to millions through satellite TV.

**How audiences view science**

*Science is inventions and technologies*

*Science is boring but useful*

*Science is rational thinking*

*Science is about experimenting and getting to know things*

*Science cannot be separated from life*

**What the Science Channel must offer**

*Stimulate and satisfy sense of wonder*

*Excellent production quality and exciting new formats*

*Scope for participation and interactiveness*

*Show relevance of traditional knowledge in the present*

*Emphasise that science is aware of its own fallibility*

# 4

PROCEEDINGS 22ND JANUARY, 2003  
SCIENCE IS EVERYWHERE, MAKE  
IT ACCESSIBLE TO EVERYONE

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- Some normative points for discussion  
*by Venkatesh Chakravarthy*
- A comparative reading of the  
presentations by the four groups
- Discussions on recommendations by  
the groups

#### 4. SCIENCE IS EVERYWHERE, MAKE IT ACCESSIBLE TO EVERYONE

##### Some normative points for discussion

by Venkatesh Chakravarthy

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Venkatesh Chakravarthy set the tone for the day with his presentation suggesting parameters for the group work.

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- *Science must be connected to life and living*

Though science and technology permeate everyday life, the teaching of science rarely makes connections to life outside the classroom. Efforts by alternative pedagogies to introduce such processes on a wider scale meet with resistance from both the authorities and teachers. Nonetheless, if any sustainable long-term benefit is going to accrue to the polity out of starting a Science Channel, it can do so only if we begin from a pedagogical framework connecting science to life.

- *In no way should we seem to talk down to the spectator.*

An alternative framework entails that authoritative modes of address be eschewed, irrespective of the target group of specific programmes. The credo for the Channel, for instance, should not be *To promote a spirit of enquiry* but *Sharing a spirit of enquiry* or *Sharing a critical spirit*. No spectator is devoid of such a spirit, only that many may not know how to sustain it in a systematic way.

- *Science should not be presented as the be-all and end-all of all human endeavor.*

Science should be addressed as something that attempts to solve empirical and conceptual problems. In this, its failures must be given equal emphasis as its successes. In effect, care should be taken not to fetishise science and technology or to promote a scientific mode of thinking.

- *A historical perspective emphasising multiple histories must dictate the content of programmes.*

Care should be taken that oversimplified linear histories of scientific progress are not projected.

- *Local knowledge, alternative research traditions and technologies must be given adequate space.*

However, in doing that, there should be caution that arcane methods are not projected as science.

- *The programming should give equal emphasis to the natural and human sciences.*

The term science is often considered as if it is synonymous with the natural sciences. Programming should therefore include human sciences, but care has to be taken that the Channel is not turned into a voyeuristic window on other cultures, as often seen on *National Geographic* and *Discovery*.

- *Specific space must be given for programmes to highlight the ethical aspects or social consequences of scientific research.*

Once it has been institutionalised, scientific research never takes place in a vacuum, even if a dispassionate pursuit of truth is supposed to inspire it. While considerable amounts of public funds are spent in solving problems related to human suffering, money is also pumped into destructive technologies in the name of science. The contradictions and dilemmas involved must be shown.

- *Last but not the least, the Channel should not shy away from addressing the ecological damage and disasters, especially those created by monumental aspirations connected with science and technology.*

Venkatesh hoped that the Science Channel would become a force to reckon with, competing for the attention of the viewers alongside other popular channels. However we must take care that the ideals of public service are not compromised.

Despite the apparent strictness of the suggested norms, he assured the group that it is possible to make joyful and interesting programmes without diluting any of these norms, and in a way, he challenged the participants to do that.

## A comparative reading of the presentations by the four groups

After this, discussions took off in small groups, based on the concerns coming up repeatedly on the first day. Everyone met post-lunch to share the outcomes.

Five focal issues were suggested for the discussion:

- Content and approach
- Software generation strategy
- Receiving-end management
- Multiple media strategy
- Self-sufficiency

*When these issues were used*

The presentations of each of the groups is given in full in an annexure to this report. Here we have made a comparative reading, putting a synopsis of the proposals of each group under certain common heads.

The discussants group-wise were:

### Group A

Gauhar Raza, Gayatri Ayyangar, Gopi Desai, Mohan Kumar, Patricia Mascarenhas, R. G. Gade, Sagarika Golder.

### Group B

Deepak Verma, Dharmesh Bhatt, Jeroo Mulla, Meher Engineer, Mrunalini Jog, Nitin Bhavsar, Venkatesh Chakravarthy, Vivek Monteiro.

### Group C

Aisha Kawalkar, Amman Madan, Kamlesh Udasi, Prafull Bhavsar, Shailaja Bajpai, Subhash Joshi, Sunil Jacob.

### Group D

Akhila Sivadas, Chandita Mukherjee, E.V. Chitnis, Hansa Joshi, Jayashree Ramadas, M.L. Hasija, Mira Desai, P.V. Satheesh, Surajit Sarkar, Tushar Kulkarni.

students, artisans and general audiences.

- Wanted emphasis on practical science.
- Wanted some amount of syllabus-oriented programming in response to what they called "the menace of tuition".

### Group B:

- Would like the emphasis of the Science Channel to be on basic needs, the uses of technology to facilitate these needs and the science behind it.
- Would like the Channel to reverse the traditional passivity of television by instigating viewers to ask questions and act.
- Characterised the channel as a combination of scepticism, plurality and openness, with the questions starting from the viewers and not channel.

### Group C:

- Emphasised the empowerment aspect, wanting to address all sections of the audience by demystifying science, by dispelling the idea that science is the prerogative of a few, and to assert that every individual can practice science in everyday life.
- Would prefer to consciously treat technology as the visible face of science and avoid complex theoretical discussions.
- However they did not want to ignore or avoid the failures or negative impacts of science and technology.

### Group D:

- Felt the channel should be projected as something of interest for everyone—dealing with the latest developments in science and technology and their implications for society.
- Wanted the channel identity and name to be playful and intriguing, keen to dispel any presumptions of bookishness, knowing how audiences feel about the dull educational programmes made in India.
- Would like the channel to highlight the science in certain traditional practices

*Wanted the channel identity and name to be playful and intriguing—keen to dispel any*

*presumptions of bookishness, knowing how audiences wanted the channel identity, and name to be*

*playful and were intriguing—keen to dispel any*

*presumptions of bookishness, knowing how audiences feel about the dull educational programmes made in India.*

*below* → Profile and personality of the channel

### Group A:

- Saw a wide-ranging audience for the channel including primary and secondary school students, college

in craft and agriculture, and the way these create a concordance between human beings and nature, emphasising the socially integrative aspects of such traditions.

- Suggested using local networks and resources for inspiration, making the channel known to such persons, thereby having a constant source of new ideas and subjects of concern, giving the channel a unique "from the grassroots" character.
- Wants the channel to be known for its independent and autonomous structure and its integrity. It should be known as the only channel not obliged to please anybody—be it a government department, or a company or an NGO.

**Bold** — Channel management

If we compare the presentations of the four discussion groups, there seems to be two trends in their views on the management of the channel.

Group A:

- Visualised a system with a strong central authority managing the entire operations. <sup>supported</sup>
- Wanted this <sup>to be</sup> backed by a consultative structure composed of national, regional and local levels.
- Proposed the formation of a National Science Consortium (NSC). This body would appoint a CEO, prepare the guidelines for the channel, recommend a core committee of experts, and appoint a team of resource persons, producers, researchers, engineers and technical experts.
  - At the same time, they saw the production as being de-centralised, with emphasis on local stories in local languages and dialects.

This implies a fairly centralised structure, requiring that a multi-layered hierarchy to manage it be in place, in advance, with complex infrastructure and human resources support.

allocation of

Group D:

- Felt the channel's management structure should ensure democracy and participation in planning, management and implementation, and transparency in the search for resources.
- Saw this as a structure that has some full-time staff, backed by constituents of a large consortium who <sup>would</sup> come in for short terms to contribute their inputs.

In comparison to Group A, Groups B, C and D did not seem to have devoted so much thought to the form of the structure. Generally speaking, they emphasised democracy and participation by all the constituent groups in the management, and wanted the management structure to be designed accordingly.

By implication, they spoke of self-forming structures which may begin simply, but would evolve over a period of time, to meet the quantitative and qualitative needs of the channel, as it diversifies its activities.

Content and approach — **Bold**

Group A:

- Was keen to interleaf social science and hardcore science and wanted programmes on history of science, health, environment and cutting-edge science.
- Recommended biographies of eminent scientists to be a useful narrative vehicle, as also visits to science museums, laboratories, factories and other places associated with science.
- Was keen to remove popular misconceptions. <sup>engage with</sup>

Group B:

- Concerned that the links between science, culture and philosophy are seen.
- Wanted the channel to have a contemporary feel, exploring the frontiers of science and bringing out the science behind headlines and issues in the daily papers.

- Wanted coverage of day-to-day practices in rural areas that reflect a keen observation and understanding of the inter-relationships in nature.
- Wanted women scientists, engineers and discoverers to be featured.
- Wanted time to be kept for school programmes specially made to enrich the curriculum, not to repeat the textbook content.
- Wanted programming to be designed to create the active participation of viewers. Centres where children can go to do experiments and other activities should be identified, and these should be equipped with cameras and facilities for uplinking.
- There must also be provision for engaging with viewers through e-mail, postcards, and phone-in feedback facilities. *Wanted*

Groups B and D both attempted to link software generation and niche audience development by recommending that:

- The channel connects up with networks of people with shared interests and creates special features to draw these organisations into the programming. Such bodies include science clubs, ham radio clubs, bird-watchers societies, astronomy clubs, trekking and adventure clubs and other activity-based groups.
- The relationships thus set up would help producers to get fresh programme ideas and it would strengthen the groups by projecting their activities and enthusiasms to wide audiences.

#### Group C

- Proposed a participative and collaborative approach of shared learning.
- Saw the content as enjoyable, relating to everyday life and contemporary concerns.
- Wanted the programmes to encourage observation and rational analysis.
- Insisted that all experiments or processes recommended on air should be actually tried out, and demonstrated in such a way that they can be done in practice.

- Expected all narratives to have a historical perspective and for the approach to be multi-dimensional, holistic and inclusive.

#### Group D

- Was similarly concerned that multiple perspectives on natural and social sciences are shown, ~~for science cannot be isolated from social-political and cultural contexts~~ *and*
- Wanted to address contemporary concerns by linking with similar trends in the past.
- Felt science is taught in such a way that it gets trapped in other issues. ~~To make sense to people, science must have a socio-economic context.~~ Problems of day-to-day existence such as water, environment, etc. can be used to create interest and empowerment.
- Suggested that specific audiences be addressed in different strands of programming. What is specific in one situation can be understood by analogy by all others, but by trying to address all in a generic way, you address no-one.
- Wanted to remind producers of the importance of the auditory aspect of television. ~~Though not everything may be watched with equal attention in a home environment with all its distractions,~~ *but* sound is a presence which draws viewers. *Unlike a cinema hall*

#### Software generation strategies *Bored*

#### Group A

- Suggested that a network of several channels, each with a regional character be established. Exchange of materials between these channels would allow a variety of materials to circulate among them for language re-versioning and re-contextualising for local consumption.
- Gave ideas on possible formats. These include docudrama, popular folk formats, animation and graphics, presentations by celebrities, demos and practical activities, quizzes, science news, outdoor location based programmes and career guidance programmes for teenagers and their parents.

- Wanted norms and guidelines for programme production to be stated clearly to potential producers. They felt quality control should be strict but transparent, though they did not spell it out further.

#### Group B

- Preferred that independent producers made programmes rather than in-house staff. They recommended keeping the copyrights on the unused stock with producers to ensure re-use, saving greatly on resources. If the ownership of the material is vested in the channel, it usually lies around unused, dumped into oblivion.

p49 \*

- Suggested soliciting material from viewers who may be in a unique position to do local coverage. With digital cameras, it is possible today for amateurs to contribute good quality material to professionally made programmes. From time to time, calls could be given to invite contributions on particular subjects.

themes

- Recommended encouraging groups of children to do outdoor explorations, experiments in groups, activities such as a study of the local environment, village mapping etc, by asking children to prepare reports with their own writing and art work. This could be communicated to schools through district educational authorities and local NGOs.

from the documents

The channel could make a selection of programmes showing those children actually doing the activities could emerge from it.

- Suggested that an annual cycle called the science calendar be started, with special features pegged to various anniversaries like World Health Day, Ramanujam's birthday, or the day that Madame Curie discovered radium.
- Felt that children are fascinated with humour, trivia, absurdities and paradoxes in science and short spots should be done on these.

#### Group C

- Suggested partnerships be made with individuals and institutions for content

development. Such relationships could be expected to grow over a period of time, and where it works out, individuals could be inducted into production.

- Recommended taking audience feedback for developing programmes and to establish mechanisms for ongoing feedback.
- Wanted to do special programmes for teacher training, and then make programmes for children related to those contents, so that such sets would be available as a teaching-learning resource.
- Suggested making the channel's facilities available to institutes and NGO centres to document their work, and to take ideas and material from them in return without paying research fees.
- Proposed a transparent commissioning process is worked out, with requests for proposals to be made public through advertisements.

#### Group D

- Felt that as a policy, the management <sup>should be</sup> has to encourage the audience to think of the channel as their own, <sup>this means</sup> and giving viewers scope to express their preferences in its content and styling. To make this work as a policy, the channel

is policy

the

management has to be committed to drawing on audience feedback and applying it to programming activities <sup>wherever possible</sup>

- To build a perception that feedback is taken seriously, a viewers' forum could be created on a website for serious discussions on programming. From time to time, referendums could be taken on audience views.
- Wants many interactive programmes to be featured—quizzes, games, experiments—where the viewers themselves come on air, phone-in, email-in and make on-camera appearances. Besides being comparatively inexpensive, such formats create participative viewership.
- Recommended that all pilot programmes should be pre-tested, and mechanisms of immediate and continuous feedback to producers be set up, the way market research organisations

keep brand managers informed about a product's performance and how it is perceived by its users.

Several participants drew attention to the fact that while huge stocks of ready material are available with various organisations, there is no convenient way of accessing them subject-wise, and it is not possible to watch hours of material serially. Yet this stock is very valuable, and can be used to generate a lot of programming at low cost. To bring all the materials to one place is not feasible, so two groups suggested the building of a virtual archive.

#### Group B

- Suggested the channel invests in building a virtual archive with detailed references to stock materials, while they remain physically with the original owners.
- Likewise, independent producers producing for the channel should be allowed to retain the unused material and they too should contribute the information on these materials to this virtual archive.

#### Group C

- Suggested developing criteria for selection of appropriate material for the archive.
- Tasks include identifying appropriate software, developing a format so that information from various sources is compatible and can be compiled in a common directory.
- Recommended that agencies at various places in the country given these parameters and are asked to survey likely sources to build this data bank.

#### Group D

- Recommends looking for existing programmes that can be sourced from within India and international broadcast organisations, that are keen on disseminating quality programmes. They could be adapted to suit local audience and tastes.

Receiving end management

— BOND

#### Group A

- Wanted to set up a continuous feedback system by forming audience monitoring and research cells with a DRS and PC at district level. There would be resource persons there assigned to do audience studies.
- Suggested making toll-free telephone numbers available for viewers to phone in their comments.
- Envisioned distribution through cable and off-line access to stored data.

#### Group B

- Suggested having DRS set-ups in educational institutions and science clubs in urban and rural areas.
- Suggested setting up awards for responsive and active science clubs, where the prizes would be adventure trips.
- Wanted separate audience research teams to be allotted for pre-telecast, during telecast and post-telecast feedback so that each study is independent.

#### Group C

- Suggested time segmentation be done for different target audiences such as students, out-of-school children and youth; home-makers, S & T professionals, senior citizens and farmers.
- Wanted to synergise the channel's activities with people and institutions working for educational reforms.

- Recommended setting up of mechanisms for participation of government, schools and NGOs for distribution and effective use, especially in rural areas.
- Felt special efforts had to be made for effective cable and satellite distribution in urban areas.

#### Group D

- Felt there cannot be any universal prime-time slot in such a channel. Each member of the family may have his/her own prime TV viewing time, which could be catered to by the channel. For example: pre-schoolers love to watch TV

early in the morning; elderly people in the mid-morning, after the active members of the family have left; housewives watch TV in the early afternoon; while children watch TV after school, in the late afternoon. So, the channel could build the programming around slots which would work as prime-time to people of different age groups and interests.

del #  
ed

- Recommended beginning with special flagship programmes directed at the prime times of such specific audiences to define the channel.
- Gradually these time slots would develop identities of their own, and from these, entire channels could be spun off later, such as a children's science channel, a health channel directed at women, an environment channel for high school students, one on the latest in science for S&T professionals, and so on.

Group C

- Was interested in developing the potential of non-broadcast media by bringing out supplementary materials such as experiment kits, booklets, short reports, attractively packaged videos and CDs with self-instructional material in print or via internet
- Wanted specialised informative websites related to programmes
- Suggested setting up video conferences, mail-in and phone-in programmes.

Group D

- Felt that the channel could actively promote convergence of communications technologies, to its own advantage.
- **It could maintain a website with programme information, facilities for viewing missed programmes, do behind-the-scenes stories of productions, get feedback from viewers, and recommend resources for further study etc.**

Normal with bold

Boed

Multiple media strategy

Group A

- Recommended exploring interactivity through computers connected to television. They see scope for e-governance and e-literacy through this medium.
- Liked the possibility of access to programmes through different media by audiences in non-broadcast mode, as and when they chose to see the programmes.

Wanted

the availability  
audiences

Group B

- Wanted a video-on-demand service to be set up through state-wise servers, where programmes already telecast, could be viewed
- Also recommended a companion website
- Recommended companion community radio station to take up programming
- And publication of low cost booklets, science kits, audio cassettes and CD-ROMs by the channel.

on subjects which need to be explained in separate lecture form

Funding for self sufficiency

Groups A, B, C and D

- Suggested that for funds, the channel network with sources such as government, corporates, international donor agencies, national agencies, media organisations, NGOs and public service organisations.

Group B and D

Group B

- Could see funds forthcoming in the short term, but they wanted the channel to develop a corpus fund for the long run
- Would solicit financial inputs from public and private corporate sectors.
- Proposed permitting advertisements as long as it does not compromise the channel's freedom to comment on the consequences of a product.

Corpus & &

Group B

- Suggested that each programmes should create its own merchandise like CD-ROMS, audio cassettes and experiment kits and that the channel should market these as an additional source of revenue.

Group B & D

Group C

- Was interested that the science channel develops a unique identity
- Would look at the corporate sector for partnerships, not depending solely on government funds.

Group D

- Felt that while initial funding may come from ISRO and DST, the channel will have to look out for funding from the outset, at a possible ratio of 50:50, government to non-government sources
- Recommended the channel builds a corpus with the help of the corporate sector and donor agencies, both national and international
- Saw scope for generating income from its own subsidiary activities such as publications, CDs, scientific toys and games.

Discussions on recommendations by the groups

*That* Science in tradition  
Mira Desai said that Group D had wanted the personality of the channel to include something which brings science and tradition together without falling into obscurantism, divisiveness or endorsing superstition. They would like to highlight the science in tradition and the concordance between human beings and nature. She asked Satheesh to recount a story which communicates this philosophy.

Satheesh said that many years ago, he was shooting a farmer on Ugadi, the Hindu new year day in Karnataka. The man performed various rituals on his agricultural implements and broke a coconut and then he did a salaam to the coconut instead of a namaskar. It turned out his name was Rahim. *There is an synergy in that practices which establishes a reverence for soil, for the tools that he uses as a farmer and it does not matter if he is a Hindu or a Muslim.*

For him The act of seeking blessings on his land and work tools at the start of

the year is a part of his cultural practice as a farmer. Satheesh hoped that *our exposure to seeking such activities would help to sensitise the young and help them to value such to such traditions.*

*The dependence on textbooks - Free*  
Meher Engineer found the idea that the science channel should complement the textbooks problematic. Textbooks were often wrong, or a mish-mash of right and wrong, and sometimes he doubted that anybody understood them. R.G. Gade explained that their group was concerned that tuitions had become a menace and they wanted some programmes to help dispense with tuitions, *reference to* ~~so the point about textbooks~~

Meher emphasised that over-dependence on textbooks is one of the core problems in education, and we should try to end this. Amman added that it is hard to complement a textbook. They were usually written so dully that the children just couldn't relate to them. He added that ideally, the teacher should be interacting with the children, doing activities in the classroom. But since that doesn't usually happen, he hoped that the programmes would help children to visualise otherwise complex topics.

*collaboration with those educational innovators to improve schooling*  
He shared a conversation he had with a boy, from a village while doing his audience survey. Three classes shared one room in his school, since the other two classrooms were so dilapidated that it was unsafe for the children to sit in them. When Amman told him about this workshop, and that children's suggestions on what they would like on TV were being taken, the boy requested *to see* him to convey to this group that the broken down classrooms of his school should be shown on television, so that the Prime Minister would see it, feel ashamed and do something about it.

It was essential that the Science Channel work in close collaboration with the many ongoing efforts to improve schooling *in the country*. Therefore, he said, the channel needed to have synergies with the NCERT, CBSE, SCERTS and various NGOs working to improve schooling. While TV could not replace

good science education in schools, it could definitely complement it.

*dg* *more on the receiving end*  
M L Hasija wanted to add some points on receiving end management. For the record, as of now, reception of KU band for re-distribution is not allowed, but it is expected that the rules will change soon and cable operators will be allowed to distribute it. Secondly, there are three possibilities for reception—the 0.75 metre antenna, only for reception, the 1.2 metre antenna with some feedback to and from the database, and the third is the 1.8 metre antenna which gives good interactivity with the database. If

*to go from the viewer and then be*  
*is to be used*  
*we done*  
*is available?*  
~~you want a webcam-quality image to be rebroadcast, then one could probably do it with the 1.2 metre antenna.~~

*what will it cost and what*  
Vivek Monteiro remarked that the question which underlies everything—is what was is all this going to cost, and what is the funding that we can reasonably expect in the context of what we have to do? Particularly, what is estimated for making programmes—the initial one-time costs, the recurring costs; the other non-programme costs?

Since it seems that this is still being worked out, he urged that it should be done soon by DECU and DST. We would have to sit down and re-think this discussion in the context of the available resources and ~~work out~~ *see* what could be done practically. Such a discussion could give an idea of how to leverage those resources into more resources so that ultimately we could have high quality science programming as an outcome.

Once the interested people know what to do and the parameters are clearly set out, then in every state and city, there are people who could make a significant contribution to the process. These people could start getting together and discussing more seriously as to what could be done, because the time we have is only 24 months.

*dg*  
Subhash Joshi responded that on the previous day, B S Bhatia had *already* stated that

there was no need to worry about funds. Funds could be found if the activity deserved it and funds should not be taken as a limiting factor. *dg*

Citing past experience, R G Gade added that at each location the receive-only terminal would cost around 30 to 40 thousand rupees. Programme production would vary—from as little as 50 to 75 thousand up to 4 to 5 lakhs of rupees for programmes of half an hour. He assured the group that they need not worry about funds. These would be available, he said, because a lot of *many* participating agencies *Q* had shown keen interest. *dg*

Venkatesh Chakravarthy attempted a rough estimate. He took 15 hours of programming per day, meaning about 30 programmes of 30 minutes each, at an average cost of 2 lakhs, which would mean 60 lakhs per day, around 220 crores annually, only for the software generation. The specifics could be worked out later, but the infrastructure cost, the administrative cost, the day to day running of it along with the general overheads also need to be added, making the estimated total around 300 crores annually.

Chandita Mukherjee said that they had to first think of a viable plan, naming the number of hours, specifying intended audiences, languages and so on. Only when a detailed plan emerges, can we estimate the costs realistically.

She pointed out that once telecast starts, it could generate revenue. The fact of actually being on air would make many potential sponsors come forward. Once the credibility of the channel is established, money could be found from various foundations and philanthropic sources.

She added that in her discussion group, they visualised taking ISRO's help initially, and then working so that within say, three years, the channel could be self-sufficient.

# 5

## TOWARDS A VIRTUAL ORGANISATION

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- Let us get started  
*a response to the workshop by Vivek Monteiro*
  
- Everyone who feels for it must take part  
*a look forward by ~~E.V.~~ Chitnis*
  
- Learning by doing: suggestions for strategic actions
  - Strengths and emerging strategies for work
  - Limitations, indicating work to be done or capacities to be built
  - Opportunities leading to short-term actions
  - Threats and long-term actions to meet them
  - Capacity-building workshops or a virtual school to build the Virtual Channel

## Let us get started

a response to the workshop by Vivek Monteiro

Speaking as a participant, Vivek Monteiro said he believed that the discussions of the past two days had been excellent. There had been contributions from a wide spectrum of stake-holders in a possible science channel, all of whom were experienced people, and there was a consensus on a number of important basic points.

The participants shared an understanding that the values of science have a critical approach, a factual approach and approach that does not claim infallibility but understands that it is fallible. This approach acknowledges its own inadequacies. The method of teaching or communicating science has to have the same approach, and this understanding should set the direction and the overall climate of the entire effort to develop the science channel.

Much of the discussion reflected points covered in the background document circulated earlier. So, this is a consensus not only of those sitting in the room, according to him, but also reflects a broader agreement, created through a consultative process preceding the meeting. He felt that if such meetings were held in other parts of the country, probably what would emerge would not be very different from what came out here. This means that there was a kind of national consensus on what a science channel ought to be doing and could be doing. That was something extremely important because, now when it comes to operationalising this broad consensus—into some 3000 hours of programmes for the first year when the channel would actually take off—there would have to be a concentrated national effort.

The question then, is how could all this be organised? ISRO and DECU had a challenging task ahead of them. He added that the challenge was no less than that of the Manhattan project which of course, had completely different objectives. Here the question

was not to get a critical mass of something destructive going, but starting a critical mass of very constructive and lively activity and how this could be done was something that ISRO and DECU had to give thought to.

After this meeting, he recommended that people from the various centres should call meetings locally, formally or informally and give more thought to how they could contribute to this effort. He said that media teachers like the people from SNTD and Sophia present here who had students with them, could think of projects that could be done as a run-up to the channel, and media students could be initiated into this work concretely.

The idea of flagship programming to create the identity of the channel suggested by one of the groups seems a good one. It is consistent with modern management methods of generalising best practices. Once best practices are identified, they can be implemented by others who take off from the original idea. If some good programmes set the tone, this would surely spur off more efforts and a chain reaction.

To achieve high standards from the beginning, we should not compromise on the resources offered to the pilot programmes—knowledge, human, technical and managerial. The question is how to network all these resources into a system? This networking need not cost very much, because many people would put in their efforts out of their commitment to this idea.

The workshop discussions have started a process and a lot of work needs to be done over the next two years. He concluded by saying that work could be started immediately after the meeting and that they didn't need to wait for formal structures and allocation of funds and resources for the thinking to begin.

we need not

not delete

*The values of science have a critical approach, a factual approach, an approach that does not claim infallibility but understands that it is fallible.*

*Create flagship programmes as a way of generalising best practices, so others can take off from them.*

*We should not compromise on the resources offered to the pilot programmes—knowledge, human, technical and managerial.*

Everyone who feels for it must take part  
a look forward by E.V. Chitnis

The voice of insightful experience in our midst, Prof Chitnis, concluded the workshop with some comments pointing us to the future course of action. He thought that two years is a very short time compared to the amount of programme production required. The hours are unimaginably huge, and the project could turn into a monster if we were not prepared. Even if many agencies were going to participate in the production, it had to be organised properly.

It is good to hear that ISRO would be providing the funds for the project, but he felt the priority requirement at the moment was some seed money, so that those around the table who were eager to participate could start some activity without waiting for the modalities of the organisation being put into position. That would help the activity to jell, collaborations could be formed and alliances be geared up. He said that ISRO should note this point and look into how soon the seed money and some estimates of the cost would be available.

Prof Chitnis commented that the people who are interested in science programmes should be left to organise themselves for production activities. ISRO should create professional management structures to meet deadlines and ensure the quality of programmes. There would be learning processes here—the first programmes may not turn out to be as good as they were expected to be—and that must not disappoint us, but make us move on.

So, some activity should start soon, and for that, some kind of flexible management structure should be put in place. The details of the formal management structure could be decided a little later, after some activity has taken off. He cautioned the group that unless this management structure was non-bureaucratic, it would not really deliver the goods, and that not all government organisations worked in the same mode

as ISRO. However, he was confident that some viable model of working could be worked out.

Turning to programme content, Prof Chitnis reminded us of the significant role of the teacher in science education. We all know the conditions of the schools and the load on teachers, so upgrading science teaching skills should be one of the important tasks of the channel. Once the skills of the teachers were upgraded, there would be better science teaching, and better public understanding of science.

The number of science teachers is so formidable that conventional means of teacher training are inadequate to cover them. In SITE, this experiment had been tried and the Education Ministry had also done it successfully, as in one year, up to 50,000 teachers could be covered, proving that satellites could be used as multipliers. In certain states where all primary teachers (like Tamilnadu) or at least a predominating number of them were women, such a thing certainly empowered women as well.

He emphasised that the quality of the programmes produced in the proposed channel had to be outstanding. Though programmes are being made by organisations like UGC, IGNOU and NCERT who have staff, studios and equipment, the results are mediocre, because those behind these lacked the necessary commitment and passion. One such centre has equipment worth Rs.60 crores lying idle. He added ironically that perhaps it is good they do not make programmes, because these would be unusable anyway.

Keeping such experiences in mind, he urged the ISRO authorities to find mechanisms where people with ideas and production facilities could be matched and programmes could be produced. This is no doubt a daunting task because many experiments and models have to be tried out before they

*People who are interested in science programmes should be left to organise themselves for production activities while ISRO should create professional management structures to meet deadlines and ensure the quality of programmes.*

*Find mechanisms where people with ideas can be matched with production facilities and programmes can come out.*

Some kind of flexible management structure should be put in place, and the details of the formal management structure could be decided later, after some activity has taken off.

can get into operational mode. From his experience he was afraid that the months will just pass away, and the time will come before they know it so they we needed to begin work fast. launch would anyone knew,

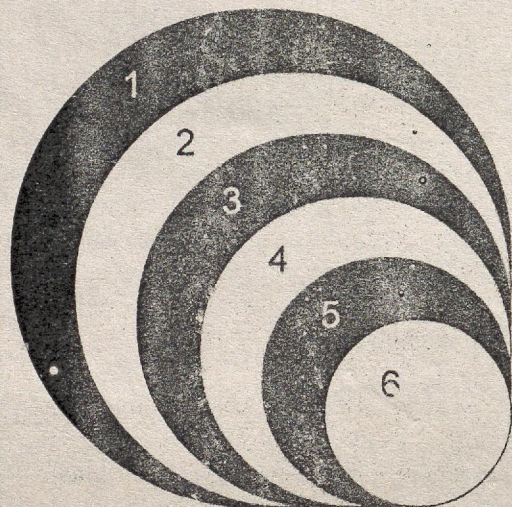
would

He concluded by calling upon Subhash Joshi to take the message of this workshop to the ISRO authorities. He said that the time had come, people were eager to work, and they were willing to hear from ISRO as to how to get started as soon as possible.

After the workshop closed formally at 4.00 pm, the informal discussions and interactions continued long after, with Prof Chitnis giving a wonderful optimistic infusion to the whole dialogue.

The last remaining people finally separated well after sunset, looking forward to something good coming out of all this excitement

**Prioritising our choices: a series of nested categories, from broadest recommendations to focused actions**



- 1 recommendations
- 2 choices
- 3 realistic choices
- 4 commonly accepted ones
- 5 priorities based on capacities and relevance
- 6 focused actions to get the Science Channel started

## Learning by doing: suggestions for strategic actions

Since the Mumbai workshop, there has been communication between participants and interest in getting something started has been expressed all around. DECU has decided they want to make a kind of "channel launch" not on air, but by announcing the activity with a public presentation around August 2003, putting the project into motion, on the run-up to the satellite launch.

Subsequently, some of us in Mumbai got together to think further about the Science Channel. We decided to do an analysis of the Strengths, Limitations, Opportunities and Threat (SLOT) factors, based on the discussions at the workshop, and to draw out some suggestions for action arising from these perceptions, and to include it in this report as a set of suggestions for action.

Thus *strengths* led to strategies for work, *limitations* showed what capacities need to be built, *opportunities* pointed the way to short-term actions, and the *threats* suggested long-term actions. These are shown in a table format on the following pages, two columns side-by-side, to be read across the page.

The operative principle in drawing up these lists is to "include that which keeps getting left out" because conventional media are not particularly keen to push these issues.

This brings up another kind of inclusion. The usual compartmentalisations in educational and career choices discourage people who think in interdisciplinary and multi-dimensional ways. Even if they have several gifts and passions, they are usually forced to choose one stream, to fit into a specialised track.

Here we need such multi-abled talents. To be a place that is known for its innovation and originality, the Channel will need to attract and actively build a culture that nurtures them.

A climate that encourages continuous learning and critical thinking has to be developed, so Channel constituents can keep growing and refreshing themselves and this reflected in the programming.

The Mumbai workshop discussions seemed to suggest the need for exposure to various kinds of experience with the objective of broadening perspectives and to create a shared outlook between the many constituents of the Channel.

We end this section with a suggested list of subjects for such capacity-building workshops, aimed at developing what Prof. Chitnis called the Virtual Channel. It is called *The Virtual School to build a Virtual Channel*.

We have shared these ideas with DECU, and expect to get a lot more suggestions from readers of this report. Your ideas could be put on the AzZ discussion page and shared by the other interested people, so do write in.

Just as we speak of sender-receiver blurring taking place, we expect your suggestions for capacity-building to come in both your capacities as potential trainers—sharing what you know, and as potential learners—asking for the things you want to know. (And there is no trainer-learner hierarchy implied.)

It is all about learning by doing, and it should be as much fun as it is hard work.

*intended* *go that order!*

## Strengths

**Strength:** The concept of a Science Channel for India is fresh, despite inevitable comparisons to Discovery and National Geographic, it will not be a "me-too" channel. It could give media makers a chance to deliver substance at high standards not seen before in the Indian TV industry.

**Strength:** Good intentions, goodwill of funders and programme makers, mission goals already in place all these

**Strength:** Government ownership of the satellite facilities.

**Strength:** Satellite allows choice of reach of signal—both national and regional. This allows thinking of a future bouquet of channels and to lay grounds for it from the inception.

## Strategies and work emerging

**Strategy:** Take this as a chance to build a channel with a unique character.

Promote the Science Channel as:

- exciting food for the mind, exceptional, one-of-a-kind channel
- specially made for India, segments tailored to specific audiences
- something original happening on it all the time, to be watched regularly so as not to miss anything
- a desirable thing to be associated with, for both viewers and media makers

**Strategy:** Draw on these strengths to start the process soon.

**Strategy:** Can be fully focused on educational goals, need not compromise on content due to advertiser pressure.

**Strategy:** To gain audiences, must work on distribution during run-up period:

- Could partner with local cable channels and DD in urban areas for pre-testing. Cable networks have registers of subscribers, useful for working out demographics of audience samples, based on the type of housing.
- Arrange screenings of flagship programmes on these channels to spread the idea and image of the Science Channel. This gives scope to pretest with real audiences. Plus it would build credibility with donors. Rent for air time for this exercise, should be paid if required.
- Extend these links into distribution relationships for relaying transmissions after 2005, so establishing these relationships will also help in the long term.
- Work out simple inexpensive dish technologies for rural areas. Train craftsmen, motor mechanics and other interested entrepreneurs in rigging these, so expertise is widely available to takers when the channel comes on air.
- Involve state governments and NGOs in making investments into community viewing facilities.

dec #

## Strengths

*Strength:* There is a fabulous intellectual and experiential resource base the channel could activate. Its components include the following.

An extensive base of academic research and industrial applications in science, engineering and technology (SET) exists in this country.

Many institutions and NGOs in India work in education, science communication and others areas of interest to the Channel and have a rich experience it could draw on.

There are many organisations working directly with people on livelihood projects such as watershed development, micro-credit, craft cooperatives, agricultural commodity cooperatives etc.

There is a good base of ready research on traditional sciences and technologies and living practitioners of these available with a number of craft-related organisations, documentation centres, local museums and private collectors.

## Strategies and work emerging

*Strategy:* Derive subjects and expertise for programmes from all these types of organisations and get them to start seeing the Channel as a window through which they could share their experiences with audiences.

- Encourage them to think of concepts that producers can turn into programming and interactive media.
- Experiments can be set up specially for filming, settings and locations accessible only to them can be made available for productions.
- Channel-related people should read their journals, spend time in their field areas, go to their annual conventions etc., with the aim of getting exposed to cutting edge developments in various scientific and social fields, and to come up with ideas for programmes.
- The Channel should also put up exhibitions and make presentations at events like the Indian Science Congress to be visible and to awaken the interest of key persons.
- Get such organisations interested in getting their audiences, whether it is farmers, schoolchildren or women to watch the Channel, to give feedback and shape the shows for the knowledge needs of their audiences.

## Limitations

*Limitation:* No well-defined channel identity is visible as yet. This is needed as a basis to draw in participants from many diverse groups.

*Limitation:* Right at the outset, before it develops an unique identity, viewers will compare the Science Channel to the international educational channels available over cable TV. If we fail to offer a scintillating alternative, we will be condemned as a poor copy and it will be difficult to change that perception. The funds will be modest compared to National Geographic or Discovery. How do we meet the challenge?

## Work to be done or capacities to be built

*Work to be done:* The spirit of the Channel needs to be projected with an evocative name, a symbol, a signature line or thought and a credo.

*Idea:* Could write a brief and give a call for name and design concept. It could be a contest open to all, but specially targeting schools of communication and design, with a good prize.

*Capacity to be built:* There must be adequate production funding to be able meet these expectations, both in terms of content and visual quality. Educational programming actually requires more funding than average commercial TV because research, travel to remote places, pre and post testing, animation to show invisible processes, and time taken over production, all add to costs.

Establish practices to stretch the available resources to the maximum, yet make polished productions. Economies to be practised in production have to be worked out. For example:

- using DV as the production medium
- low-cost non-linear editing systems
- using archival footage to avoid field trip expenses
- adapting ready overseas materials
- to give polish make sharp graphics and packaging
- one way to make expensive-looking productions at reasonable cost is shooting collaboratively with producers in other parts of India. For example a series on the traditional house forms of India could be done by a dispersed group at considerable saving compared to one unit touring the country.
- Overseas collaborations could be tried. For example a series on the travels of Yuan Chwang (he reports on the SET of the Gupta period) could be done as a collaboration between the Channel and China TV with the location costs in their respective countries being borne by each, in exchange for the material from the other.

## Limitations

*Limitation:* The target audiences named are very diverse. It appears that we have several potential audiences in mind and they have distinct knowledge needs (farmers may find one thing useful, primary school kids something else).

## Work to be done or capacities to be built

*Capacity to be built:* Think of several channels with distinct personalities, and even several languages for certain channels.

- A first exercise could be to develop one channel with a time chart indicating specific audience segments, allotting distinct time slots throughout the day to each, and keeping fare for the whole family for the evenings.

- Producers can then choose the audiences they have a preference for and propose programmes accordingly. Unlike other channels, who allot more funds to the evening programmes (compared to daytime shows), this channel should not discriminate because all times are prime time for one niche or the other.

- Flagship programmes typifying the identities of the future bouquet of channels will be shown, and they will find their audiences.

- Then we develop these time bands into separate channels, each run by its own management team, even if some producers are common across time bands.

- Once sufficient funds are raised, the channels could be launched as vehicles directed exclusively to that audience.

How are the bands to be identified and prioritised?

Research revealing the knowledge needs of different sections of society is obviously needed. To start off, some iterations made at the workshop:

- A *Children's Science Channel*, related to the curriculum, but not directly, with the following bands:

- o 10 to 12 pre-school fare focusing on language and numeracy
- o 12 to 2 primary school fare
- o 2 to 4 middle school fare
- o 4 to 6 non-school-going but semi-literate in 12 to 16 age group
- o 6 to 8 high school students
- o 8 to 10 young adult infotainment

## Limitations

What happens after focal channel identities are decided?

*Limitation:* The requirement of even one channel (6 hours of programming x 3 repeats x 365 days) is 2,200 thousand hours of programming annually. Where is the human capacity to meet this need in terms of high quality productions? And we are talking about soon branching into multiple channels for specified audiences and later, regional languages, meaning many more hours of material.

## Work to be done or capacities to be built

- *Women's Channel*, beginning with health, parenting, nutrition, and moving into all aspects of SET. Since mothers have a hand in improving all aspects of family life, everything can be brought in here, with a women's perspective.
- *Environment Channel* that is passionate about India, like the children's channel, different time slots can be kept for separate age groups.
- *Village India Channel*, looking at bio-mass production-based and simple mechanism-based ways of life, but for everyone, not farmers particularly. It's about people's science, how villagers survive in drought-prone lands, mountain valleys and marshes, make things work despite challenging circumstances.
- *Teachers' Channel*, a teacher's training institute of the air, dividing the time subject-wise and in curricular stages. Additionally, it could give teachers and parents an opportunity to partake of new developments in education and to participate in debates and discussions on the nature of education.

A checklist of contents and values to be projected has to be done for each subject area and audience group. This is where collective iteration works best. Invite those who work for that audience anyway (say innovative teacher's trainers for the Teachers' Channel) and set up a brainstorming process.

*Capacity to be built:* The coming two years before the launch should be devoted to building a network of individuals and centres to contribute to high quality programming. Located all over the country, this is being alluded to elsewhere in this report as the Virtual Channel.

## Limitations

*Limitation:* At the risk of appearing to generalise unfairly, one has observed that often, media makers tend to make instructional programmes in a rather unimaginative and functional way, structured according to the logic of the content brief given to them.

It could be that people who view themselves primarily as communicators tend to place limitations on their involvement in subjects outside their experience and prefer not to get into the nuances, leaving that to the content experts.

How do we take care that our programmes are rich in texture, have a personal feel and do not look mechanical? How do we ensure that our producers are continuously challenged to understand and interpret what they are doing and as they grow, the Channel keeps on getting better?

## Work to be done or capacities to be built

*Capacity to be built:* Being products of the prevalent educational system, all prospective persons can't be expected to be clued in beforehand to science and the orientation of the Channel regarding science—seeing it in the social context, not thinking of it as the magic answer to all ills, etc. They need exposure to these ideas.

- Orientation workshops to familiarise possible partners with the core values and norms of the Channel are needed. DECU managers, freelance producers, subject experts, NGOs in education and faculty of media training centres have to be included in this learning process. An orientation handbook can also be developed for wider circulation.

- Create opportunities for scientists and development workers with an interest in science communication, to come up with ideas for programmes. Let them work closely with media makers in conceiving and producing programmes. People showing a flair for such work could be offered training opportunities and be inducted into production, much the way BBC offers British academics a chance to get into programme-making.

- With the proliferation of media training centres, and the affordability of professional equipment, many young independent documentary film makers are suddenly on the scene. They think innovatively, are looking for work and their numbers are growing every year. Get them interested to contribute by promoting the channel in web-based discussion groups like Docuwallahs, Wisdomtree, Sarai and others.

- Make contact with faculty at media institutes and encourage student productions which may be telecast, and may open the route for these youngsters to the Channel.

- Make presentations at documentary film festivals such as MIFF.

## Limitations

*Limitation:* The technical specifications for the channel are not clear yet. Related to production are questions of technical quality, which must be the best possible within budgetary limits. For example, it is recommended that work on the new channel should be entirely in DV from shooting to telecast, enabling greater flexibility and saving of production costs. This is already being done by Eenadu and channels all over the world.

*Limitation:* Content expertise, audience understanding, proposal vetting, commissioning and guiding productions, financial management, fund-raising, channel scheduling etc. all would have to be managed out of DECU.

This is a heavy load to carry, and all the experience needed for nurturing and managing many organisations that consistently produce television of a high standard may not be available under one roof anywhere in this country.

## Work to be done or capacities to be built

An apocryphal tale: once there was an Indian culture channel (which died even before it was launched). One problem was that its commissioned programmes often appeared as if they did not belong to anybody. Exactly based on scripts approved by the channel before shooting, no one could find fault with them, but the experience of the location rarely showed in the final products.

For richness of texture, perhaps spending time at the location would give makers a chance to develop their own ideas and observations on the subject. It should be made part of the proposal-making process, so the experience is reflected in their work.

*Capacity to be built:* However, what are the specifics? If it is DV, which format: mini DV or DVCam or DVCPro? Picture: uncompressed or compressed? If compressed, at what ratio? Sound: mono or stereo, at what sampling rate? This is actually very urgent, so that the standards are set at the earliest, and production can start.

*Capacity to be built:* The Virtual Channel idea again. Form a decentralised structure where all players, functioning from various locations independently, contribute what they do best.

To coordinate the work locally, small regional offices could be set up within existing institutions. These would stay in constant touch with DECU.

Experts from required fields could be assigned jobs such as scanning proposals, checking out budgets, pre-testing, commissioning and reviewing projects at rough cut stage etc. They should be paid for the time they spend on this, so they act responsibly and professionally.

Alongside create scope for maximum exchange between the nodes. For example, if a producer based in Delhi

## Limitations

*Limitation:* The persons commissioning the work should be able to critique the scripts and programmes at a pre-final stage and make useful suggestions to their makers to steer them to a good end product. How do we locate or train a body of such persons?

*Limitation:* Models of commissioning practised at both Doordarshan and the private channels do not encourage producers to give their best. Traditionally programmes have been commissioned on the basis of bank guarantees or direct financing by the producers, at least at the pilot stage.

While this protects the channel's interests, it blocks the way for interested and qualified people who do not have the ready capital. It also encourages persons with ready cash, but not the abilities, to enter the field. This degrades standards all around as finally these commercial persons are the only ones who can last out the competition.

How can this channel be different in its programme commissioning process?

Alongside, how will confidentiality of proposals be maintained without creating structures which may protect, but also open up scope for abuse?

## Work to be done or capacities to be built

needs a sequence shot in Tamil Nadu, she does not have to rush there, or ask Ahmedabad for help. She contacts a counterpart in Tamil Nadu to do it.

*Capacity to be built:* We could draw on other channels for experience of maintaining high production standards and continuity while getting work done by dozens of different persons in a professional way, without tensions.

*Capacity to be built:* Learn how similar channels in other countries examine and commission proposals, and how they keep the process open and transparent.

The Science Channel will have to formulate its own policy on financing, perhaps be prepared to take some amount of risk on the basis of an idea and a script, trusting the producers on the basis of their track records.

One model could be that producers do the research and script of the first four episodes on their own resources. Once these are approved, the Channel gives the full amount for the four episodes, to start off the series. Starting costs are always heavy compared to the production expenses of a running series, as a number of one-time investments (theme music, title design, the set, etc.) are called for, which are not repeated later. For further episodes, funding could continue on advance and delivery basis, in sets of four or whatever is convenient to both parties.

Another way of dealing with the risk and trust factor is that regionally, several producers who expect to work for the Channel get together and form small consortiums to share equipment and studio space on their own resources. DECU gives some recognition to such collectives to enable bank credit to be extended. It could then help them by way of advances to the registered body, with the group taking responsibility for delivery of the product rather than an individual.

## Limitations

*Limitation:* Government ownership of the Channel and satellite facilities could compromise its independence.

*Limitation:* Adequate documentation of resource persons, organisations and other contacts needed by workers on this Channel, is not readily available.

## Opportunities

*Opportunity:* Hundreds of labs and institutes under DOS, DST and CSIR and the Universities are doing interesting work, and are interested to communicate their work to the public and may even have budgets for publicity.

*Possible liability:* In exchange, the agency may expect uncritical promotion and sycophancy, and pressure may be applied to ensure it.

*Opportunity:* Hundreds of hours of ready material are available with various organisations, and can be used to generate a lot of programming at low cost, yet there is no convenient way of accessing them subject-wise.

*Opportunity:* Across different communities and classes a need for career counseling is repeatedly expressed. There are new kinds of courses and careers which parents, students and teachers are unaware of, which represent economic opportunities.

## Work to be done or capacities to be built

*Capacity to be built:* To build and maintain credibility, the Channel management should aim to function in a zone that is public service but autonomous, not a direct arm of government. The Channel should be known for integrity like BBC or PBS, unbendable by business or political interests.

*Capacity to be built:* Create a resource directory. While doing this, make the Channel known to the people listed, and build up a climate of goodwill so they see reason to come to the Channel with their ideas.

## Short-term actions suggested

*Short-term action:* Approach them for sponsorship, offering exposure on a TV programme, and a film they can use for their own publicity needs, provided they fund both productions, using more-or-less the same material for both.

*Safeguard:* The Channel will have to put conditions in the contract that make it clear that the subject is the work, not the institution or a personality. The management of the Science Channel would have to stand by this policy firmly.

*Short-term action:* The Channel invests in building a virtual archive with detailed references to such stock materials, while they remain physically with the original owners. Criteria for selection of appropriate material for the archive, choosing appropriate software, developing a format so that information from various sources is compatible and can be compiled in a common directory are tasks that need to be done to establish the archive.

*Short-term action:* The Channel ought to address the need for career guidance with programmes which guide young people to options they may not have heard of otherwise.

Here too, some sponsorship could be

## Opportunities

*Opportunity:* There are bright young people from backgrounds which do not give them access to media courses or technologies, but who are interested to become media makers. How do we draw such young people into the network?

Ultimately, the Channel must be able to show programmes made by people without formal education, informed by the questions being asked by people who normally don't get a chance to get their voices heard in the media.

## Short-term actions suggested

sought from agencies seeking to promote certain disciplines among the public or seeking trainees for particular courses.

The Channel should also aim for the realisation of the special qualities and aptitudes of each individual, especially gifted individuals in economically depressed circumstances. It could have a special project for discovering geniuses for which sponsors could be found. Given the interactive possibilities of the new media attached to the Channel, it seems more possible than ever before to encourage recognition of their gifts and to open out opportunities for them.

*Short-term action:* The world over, people have done work where video cameras and computer terminals have been put into the hands of under-privileged youngsters and adults with wonderful results. These experiences suggest setting up trainings within NGOs and institutions committed to these goals, apprenticeships with the Channel's producers and ultimately working video units like the one Satheesh is running at Deccan Development Society.

These may need to be set up within institutional frameworks initially, and the initiatives could be taken by those institutions, but the Channel should be a client, commissioning work from such teams.

## Threats

*Threat:* The Science Channel could start off well, but after some time, the Government policy may change, and it may not continue to support it. Apart from that, for the best outcomes and independence of content, the channel has to become self-sustaining after the initial period. How do we achieve this?

*Main question:* How much of a corpus would the Science Channel need?

## Long-term actions to meet them

*Long-term action:* Register an autonomous society and build a corpus fund to maintain the Channel in the long run.

- Go around to all the major backers within government for contributions.
- Get the public sectors giants to donate.
- Arrange for Income Tax Certification so tax benefits are granted.
- Encourage corporate donors to contribute. Convince them that besides the tax benefit, the association with the channel would give them respect in the community.
- Think of various revenue generating activities. Consider accepting advertising, but having a code to govern this. Develop spin-off non-broadcast products (books, CDs, experiment kits etc.) to be marketed. Keep material from the archives on sale.

*Rough estimate:* A rough calculation offered at the workshop costed every 30 minutes of programming at 2 lakhs of rupees at an average, (some would be much less, others may be much more).

- Take 6 hours of programming per day (3 repeats and 6 hours closed)
- This means about 12 programmes @ 2 lakhs each, or 24 lakhs per day, or 88 crores annually, for the software.
- The overheads, infrastructure, day-to-day administration etc. would add say 33%.
- This makes the estimated total around 117 crores annually.

To receive 117 crores annually, at a 6 per cent rate of interest, the channel would need a corpus fund of 1,950 crores—1,950,00,00,000 an amount difficult to visualise for most of us!

Who knows, it may even be possible to collect it—if it can be worked out by DECU and DOS!

Anyway, the resources to get started are visible, so we need not worry about the corpus just now.

## The Virtual School to build a Virtual Channel: a note on capacity-building

Professor Chitnis' concept of a Virtual Channel, (VC) with a virtual organisation behind it, was immediately accepted at the workshop. He called it a participatory, autonomous, non-bureaucratic, decentralised organisation, with its constituents dispersed across India, linked through satellite communications.

This will be a totally new situation, quite unlike the traditional TV station. There everybody worked under one roof with the security and drawbacks of a closely managed structure. Here all contributors would be independent, the relations contractual and the Channel's would not have their time exclusively. Yet they have to work coherently. In the absence of a direct day-to-day relationship, it is very crucial that a shared outlook and mutually accepted practices are consciously evolved. The Channel management has to enable this by creating a viable and accommodative organisational form for the VC.

The Mumbai workshop suggested that meetings to introduce the Channel to likely constituents and to seek their involvement be held. To gather active and creative participants, the wider our network, the more effective it will be in drawing the likely people onto the common platform of stakeholders. Subsequently, there is a need for exposure to various kinds of experience with the objective of broadening perspectives and to create a shared outlook between the partners of the VC.

This suggests a series of workshops. Some could impart skills that participants seek, and give exposure to experiences they want to see up close; others could be meetings to decide on common courses of action, to work on programmes, policy and so on. These are suggestions for some workshops and their objectives, which together would make up the Virtual School.

1. *Bringing in the makers:* several workshops to familiarise potential constituents with the VC concept and to

identify issues for programmes, and to generate proposals regionally. Local media makers, institutions, NGOs and social researchers should be called, to think about the Science Channel and their possible contributions to it. DECU has planned at least two such meetings shortly, at Bangalore for people from the South and at Kolkata for participants from Eastern India and the Northeast.

2. *Bringing in the young:* orientation workshops with students of professional media courses, introducing them to science communication, the Channel and its goals. Most such courses have a requirement for a final semester documentary film. Students could be asked to make these as pilots for series they could later propose. An appropriate curriculum has to be created for this group, and after a few rounds, a handbook could be developed. This course could then be taken by their own teachers with the Channel representatives interacting with them on proposals.

3. *Bringing in the ones who get left out:* video cameras and computer terminals have been handed over to underprivileged youngsters and adults with very exciting results, the world over. The Channel could draw on these experiences to set up trainings and apprenticeships, to lead to such production units being formed later. These would have to be situated within potential host institutions. To start off, trainers with such experience could take workshops with potential host institutions. Once some of them decide to take up this activity, the Channel could stay in touch and foster further growth.

4. *Bringing in the latest:* From time to time institutions in the VC could run courses to keep media makers refreshed on cutting edge developments in their fields. These could be prompted by requests from learners.

5. *Managing the channel:* could be the subject of several workshops, the objectives being to examine various

broadcasting management structures, commissioning processes etc., international and national. One of the key issues would be quality of programming. What would be the operative norms to ensure that it is ever-inventive and fresh? How does the channel management apply these norms in a strict but transparent fashion, for hundreds of hours of programming? How can the norms be made to work as a source of inspiration and capacity-building for producers, helping them to flourish, rather than appearing as a form of control, an oppressive formality to be endured?

Besides Channel executives, this process must include media makers so a shared understanding informs policies and actions. Trainers could be sought from channels such as BBC, PBS, Discovery, NatGeo and public service stations from France, South Africa and Australia. Closer to home, we could interact with Ekushey TV of Bangladesh, a high-quality, profit-making non-fiction channel started with BBC know-how.

**6. Relating the Channel to audiences:** the Channel needs to pay special attention to audience needs monitoring and receiving and facilitation. The aim is to create a strong relationship between field workers with direct contact with potential audiences and the channel and media makers. Workshops in this stream could cover topics such as:

- *Programme pre-testing:* to be arranged in hands-on mode, with participants coming with ready scripts. These are pre-tested, modified after audience discussions, then shot and edited, with the programmes being pre-tested, during say a 14 day period.

Participants would be VC members working in organisations with social research experience and/or familiar with specific kinds of audiences and interested in receiving end facilitation. Beside them would be media makers. The group would get an orientation to developing

pre-testing and post-testing formats such that producers can put the findings to use in making programming. At the same time, producers would be oriented to audience research, its importance for them and how to place demands on the researchers for feedback that would help them in their creative work.

This sounds expensive and time-consuming, but unless something practical like this is experienced, it would be difficult for VC members to internalise the learning and incorporate audience research into their routine work discipline. Several such workshops could be filmed and that material could be developed into training films for future orientation workshops. Some of the trial films made may even be worth telecasting, and they would come within the cost of the workshop.

- *Soliciting audience feedback at telecast*

The idea is to expose our producers to the possibilities of processing the feedback they receive and making it a guide to future episodes or of fresh productions. Producers who have relied on audience feedback to guide their work could be asked to speak about their ways of working. We should call CFAR which plays a media watching role, particularly from the viewpoint of women's and children's issues and whose Viewer's Forums are something the VC members should know about. Market research organisations who have experience of doing qualitative analysis of programmes for advertisers, and who have suggested mid-stream modifications to enhance viewership could be asked to share their experiences also.

7. Another set of workshops could be held later, closer to the Channel launch to familiarise people in the social development sector—involved in health, education, water harvesting, micro-credit with the channel's mission and the crucial role they could play in making it useful to the sections of society they are in close touch with.

# 6

## ANNEXURES

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## 6. ANNEXURES

### The Virtual Laboratory—an arena of interactive learning

by Krishna Naidu, International Institute of Information Technology, Hyderabad

Krishna Naidu teaches at the International Institute of Information Technology, Hyderabad. He was invited to the Mumbai workshop, but was unable to come due to teaching commitments. However, he sent in this note on the concept of a virtual laboratory (VL) as his contribution to the discussion.

As the note explains, he sees VL as an arena of interactive learning which can be moderated to the learner's own context, much the way several NGOs have developed learning programmes to suit their particular learners.

#### How do we educate?

The traditional method of learning was by doing. Concomitantly, teaching meant 'making the student do and thereby learn'. In a recent interview Chomsky says "I think you learn by doing...you figure out how to do things by watching other people do them ... that's the way you learn to be a good physicist. Nobody can train you on how to do physics. You don't teach methodology courses in natural science.....you just watch people doing it and you participate with them in doing it ... not all that different from an artisan picking up a craft and working with someone who's supposedly good at it." (*Liberating the Mind from Orthodoxies. An interview with Noam Chomsky by David Barsamian. May 2001. www.zmag.org*).

Educational analysts and psychologists are unanimous that only half of what we learn is based on what we see and hear. School children, especially rural children, are continuously learning by seeing and doing. This provides a clue<sup>9</sup> on how to effectively 'impart' education to such children.

The paradigm shift we propose therefore, is from education based on Subject-Matter Expert to Interactive Communication.

Problems with the present system Education in general, and particularly science education, has little or nothing to do with the life and day-to-day activities of the (rural) student. 'Education' sits outside his sphere of normal activity. Most children work with their parents and learn in the process. This knowledge base, *lokavidya*, has to be integrated into education, and be given legitimacy to make learning-teaching meaningful and effective.

Present day science education draws concepts and examples from idealised situations rather than from day-to-day experiences. This lends an esoteric aura to science and makes conceptualisation difficult for the learner. The experiments of the Hoshangabad Science Teaching Programme and other innovative curricula show that the form and method of communication in science education is crucial to the learning process.

Most science education in India, whether in English or the regional language, is based on Western modes of conceptualisation. Ideas and concepts are thought out in English and in a foreign scenario, and then literally translated into the regional language without adaptation to the new context. Though the reliance on such sources may be unavoidable, any proposed strategy for meaningful science education has to take the local idiom into account.

#### Information Technology (IT) based strategy

We propose to use IT to develop a strategy which can be sustained over time, to provide science education to rural students regardless of geographical, linguistic, socio-economical and gender barriers.

IT offers some unique solutions to some of the problems that have been identified:

1. Free access to knowledge—digitised knowledge packages on CDs, and online, Web-based education can be effective solutions for providing access to remote branches of learning.
2. Free access to best educators via live communication—novel approaches such as Wireless in Local Loop technologies offer good solutions. Reception and dissemination at local centres (rural schools) can be effected using appropriate audio-visual appliances (say, a modified TV set).
3. Flexible media of learning—multimedia and multi-lingual solutions can enhance the effective communication of concepts.
4. Innovative modes of learning via the use of virtual laboratories—incidental and hands-on modes of learning, offer solutions to practical training that is important to conceptualisation in science. Concepts can be communicated with content based on everyday phenomenon and activities.

Thus, IT based methodology has the advantage of making the best instruction/training available to the remotest student.

#### *Current State of Knowledge and Activity*

##### Role of NGOs

Many NGOs have been active in the field of informal science education, e.g. Kishore Bharati and Eklavya in M.P., Vigyan Shiksha Kendra in U.P, Homi Bhabha Centre for Science Education in Mumbai, KSSP in Kerala, Tamil Nadu Science Forum and others. They have produced written material for science instruction—syllabi, lessons, tutorials as well as experimental kits and procedures using locally available materials.

The material produced by these groups has, in some cases, gone into wide-spread use, for example, the curriculum and lesson plans developed by Kishore Bharati (Hoshangabad Science Teaching

Programme) were adopted by the M.P. Government for its schools. Characteristically, these efforts are geographically confined to specific regions and depend on local volunteers who act as teachers or mentors, and their material output has been in the regional medium.

##### The Virtual Laboratory

The Virtual Laboratory (VL) provides a platform for conducting experiments. It serves as a powerful tool to deliver concepts via interactive learning and enables free testing of ideas. 'Experiments' in a virtual laboratory use simulation as a primary vehicle with scope for interaction by the user-learner.

The 'experiments' have two aspects: demonstrative and interactive. The demonstrative side provides a passive mode of learning where the user gets to 'see' (audio, video and animation) a process—preferably a natural one.

At the same time, aspects of the experiment pertaining to concepts are emphasised. The latter facilitates an active mode of learning by allowing the user to introduce variations to existing experiments and observing their effect. New experiments to test ideas can also be devised by the user using the extensive range of tools provided in the Virtual Laboratory.

Experiments can be tailored to the local contextual information of the users. For instance, the concepts of friction could be conveyed effectively using a carpenter's plane and through the motion of a cart wheel. The experiments could be graded concept-wise by the local teacher or mentor.

The experiments would be user friendly, making extensive use of graphics and multimedia. They could be stored on portable media—floppy or CD and would also be available on the Net.

#### Some efforts in Virtual Laboratory development on the net:

- (i) A Java-enabled virtual lab for learning statistics is to be found at [www.ruf.nice.edu/~lane/rvls.html](http://www.ruf.nice.edu/~lane/rvls.html). This includes an e-book, demos and analysis tools.
- (ii) A Web-based project for storage & retrieval of chemical information - 2D & 3D Molecular Structures and their associated experimental & spectroscopic properties is available at [www.ch.ic.ac.uk/vchemlab/](http://www.ch.ic.ac.uk/vchemlab/)
- (iii) A chemistry virtual laboratory developed by University of Virginia is available at ([javalab.chem.virginia.edu](http://javalab.chem.virginia.edu)) Another such effort for an online version is also on at Imperial College London.
- (iv) A physics virtual laboratory developed by various contributors is available at [www.physicsweb.org/resources/Education/Interactive\\_experiments/](http://www.physicsweb.org/resources/Education/Interactive_experiments/) and at [www.physicsweb.com](http://www.physicsweb.com)

#### Significance of VL in the current context

VL development efforts around the world signal the emergence of research in educational technology and virtual learning environments as a significant trend. This development is still at a nascent stage, marked by limited interactivity, platform dependence and lack of 3-D examples in the existing VLs.

Our effort is focused on developing a VL tailored to the Indian rural context, to work within the constraints imposed by this context. For example, an online model will be inappropriate at present, since even when connectivity is available it suffers from low bandwidth.

Now that we know that EDUSAT will be having provision for interactivity with user groups, VL assumes a new significance. It appears to be an opportune moment to experiment with VL in the Indian context, hand in hand with educational groups and institutions working with specific groups of learners.

#### **Rapid appraisal for viewer's perspectives for the proposed science channel**

*Prepared for workshop on Science Channel on Edusat, by Sagarika Golder*

#### Science, Society and Mass Media

The mass media have played a significant role in these moves and it is thus essential that they are fully engaged in the development of new forms of participation in the governance of science and technology.

There are three key aspects to such developments:

- Facilitating scientific understanding of citizens
- Encouraging dialogue between science and the public
- Enabling a deeper understanding of the social and economic context in the media's treatment of science.

#### Objectives of Rapid Appraisal Study

The basic objective is to provide a starting point for understanding the viewers' perspective. The main focus is on:

- Providing insight into how the media constructs public interest and concern with science
- Possibilities for new forms of narrative and presentation style
- Setting the groundwork for the design and evaluation of new approaches to the communication of science and technology
- Setting the groundwork for designing and evaluating future new initiatives, which will include using interactive features of digital TV and the web to encourage a two-way relationship between public and scientific knowledge.

#### Location and focus groups

Students of primary, middle and high schools as well as colleges and universities form a major share of the proposed audience group. The focus groups were selected keeping in mind a representative sample. The location of the study was in the city of Mumbai.

Two schools representing extremes were selected

- Kendriya Vidyalaya IIT, Powai, which represented an elite school with children from educated, middle class and upper middle class economic background.
- Shivajinagar Municipal School, which had children from the slums, representing the lower economic background.

To get an overall viewpoint we divided the students into two age groups, 8 to 12 years and 13 to 17 years. There were 15 students in each group.

Students were selected by the school authorities from all classes representing all ages with an equal number of girls and boys in each group.

Two colleges selected were:

- The Indian Institute of Technology (IIT), Powai, a premier institution providing specialised technical education.
- Jhunjhunwala College, providing Bachelor's degree in different disciplines

Apart from these, discussions were also held with some youths from the slums of Govandi who had to abandon their education due to socioeconomic compulsions and take up various professions. Both men and women were equally represented as far as possible. The age groups were 18 and above.

#### Methodology

The basic objective of the study was to feel the pulse of the select target audience. Though there was a set of guiding questions, these were not asked in a survey mode according to a chronological order. The questions were basically open ended and the method was a very informal guided group discussions and some interactive question answer sessions with the respondents. The idea was to get a

general picture of the views and suggestions of the focus groups.

The questions dealt with three aspects

- Their general understanding of science
- The media habits of the respondents
- Their recommendations for an educational channel

#### Findings

Since the format was an informal and long group discussion, the questions were not asked in any chronological order, also only relevant questions were asked to each group. Only the important parts of the discussion are focussed in these findings.

#### General Understanding of Science

##### *What is science?*

Some responses to this questions were bookish whereas others were based on common sense.

A student from Jhunjhunwala College said that science answers all our 'wh' questions like what, where, when, what and how. According to another, science is magic which worked wonders at the touch of a button.

The school students thought that science was mostly about inventions and discoveries. Some thought it helped in rational thinking and others thought it elevated our standard of living.

To the children of municipal schools, it was just another subject. They knew what science was but did not have a bookish definition, and they talked more of technologies.

The slum youths defined science in terms of practical usage.

##### *Do you find science difficult?*

A schoolgirl from commerce section thought science was boring. However it could be interesting if presented in a proper way.

Some junior students found science boring the way it was taught in classrooms. The senior school students did not find science difficult in general.

*How does science help in daily life?*

All the students gave examples of practical uses of science. A junior school student had lost his cycle keys in grass, which he revived with the help of a magnet. There were similar examples from the senior students also.

The young women from slums stressed on balanced diet and prevention of diseases as a practical application of science.

To the young men of slums the practical application of science involved awareness about issues like cleanliness and other issues, which improve the quality of their daily lives.

*Where do you go when you find something difficult to understand?*

When they have a problem regarding science the junior school students generally asked their teachers and parents for solutions.

The senior school and college students referred to books, encyclopedias, or the internet for their solutions.

The IIT students had little time for anything else but studies. Since they had the best and most advanced knowledge resources at their disposal they made full use of these. In fact they even read their newspapers on the net.

*Have social awareness programmes on TV prompted you to take any remedial steps?*

All the respondents answered positively to this. The school children had stopped bursting crackers because they caused pollution, harmed lives and promoted child labour.

One of the junior school students has taken to riding on bicycles to prevent

pollution whereas another makes paper bags for his mother. Most of them planted trees periodically, stopped throwing garbage here and there thus contributing to the environment in their own individual way.

One of the slum youths said that the current advertisement campaign on AIDS with the character 'Balbir Pasha', was very effective with the slum youths.

Media Habits

*What channels and programmes do you watch?*

It was found that sports was a great leveller. All the respondents except for young women from the slums watched cricket matches. The junior school children watched channels like Cartoon Network, Discovery, National Geographic, Animal Planet etc. They mainly watched programmes on animals, inventions and discoveries, science fiction serials or movies for children.

The viewing habits of high school children were more or less similar. Their preferred programmes included 'Medical Detectives' and different quizzes like National Geo genius, 'Mastermind India, the Bournvita Quiz contest etc.

In both the cases their parents rationed their doses of TV viewing.

The municipal school children and the young women from slum areas mainly watched the daily soaps and serials for entertainment. Some young women aspired to be like the lead characters of the TV serials. Similar is the case with some girls of Jhunjhunwala College. They thought that these serials represented the Indian culture.

Ironically a few boys and girls from the same college vehemently opposed this viewpoint and said that these serials are corrupting our culture and lifestyle. They are promoting consumerism and should be immediately stopped. This

group of students largely claimed to watch news and educational channels. The music channels like Channel V and MTV was also a favorite among some.

The trend among the young men of slums was to go to a theatre and watch movies rather than television. Also they did not have much time to watch television because they were busy earning their daily bread. When they sat in front of TV they watched soap operas for entertainment.

The IIT students also did not have time to watch television. They were busy with their studies and whatever free time they got, was utilised for betterment of their future. They did watch a few educational programmes which were of special interest to them.

#### *Views about 'Kaun Banega Crorepati' and other similar programmes*

There were mixed reactions to this question. The general response was that it did appeal to the wider public partly because of presenter Amitabh Bachan's charisma and partly because of the sums of money involved.

The school students thought that the initial questions were too easy but got tougher with higher stakes. Programmes like Turning Point and quizzes had a wide appeal among the senior students.

#### *Where do you go for career advice?*

One thing which most of the students felt was lack of career guidance. Most of the High school students thought there should be career counseling after class 10. Even the college students were at a loss. Some had taken up courses because of parental pressures, others opted for certain courses because their friends and seniors advised them.

The IIT students were also under parental pressure to get into a professional course and hence joined coaching classes to get into IIT.

The slum youths also wanted information on courses that would help to better their careers. Most of the respondents made random, not informed, choices regarding their careers.

#### *What is lacking in our educational programmes?*

Dull, drab, boring etc were some of the expressions used for the UGC programmes. They were merely an extension of the classrooms, said some IIT students. They lacked glamour and entertainment value said the students of Jhunjhunwala College. The school students said that the programmes used long and difficult words. They were mainly shot indoors and lacked practical information, they said.

#### *If you had to make an educational programme how would you make it?*

Cartoons, science fiction dramas, docudrama, quizzes etc. were the main formats that came forward as suggestions across all the respondent groups.

Taking the viewers on locations and performing experiments also seemed effective.

One of the IIT students thought that biographies of famous scientists in various fields would be very effective.

The children from the municipal school thought that the serial format is very effective. They wanted the programmes with some useful information, a little bit of comedy and emotional appeal. Mainly they would make programmes that gave practical information about our daily lives and thus be useful as well as entertaining.

The college students felt marketing the channel was important. They wanted knowledgeable and well known presenters and good looking sets. They were keen that the programmes be advertised properly and regular surveys be taken to see what viewers wanted.

**Rapid appraisal for viewer's perspectives: findings of S.N.D.T. students**

*by students of Post Graduate Diploma in Communication & Media, SNDT Women's University*

Sample size: 100 respondents

Profile: Broadly three age groups: 8-12 years, 13-17 years, 18-25 years and above 25 years. They all belonged to the middle and upper middle class all having TV sets with cable connections.

The presentation was in four parts:

1. Use of television as a medium because the focus of the presentation was use of television for science communication and audience reactions towards television as a medium.
2. Viewership of existing informative programmes to anticipate issues related to the proposed science channel and its curriculum.
3. Usage of television medium for problem solving/ knowledge seeking highlights the knowledge seeking behaviour of people and media-resorting habits of people.
4. Expectations from the new channel to enable it to prioritise its programming techniques and generate briefs.

Use of television as a medium

Only one person out of the 100 does not watch television at all and this was in the age group of 13-17. People watch DD only if it has exclusive rights of sports, mainly cricket. People had varied preferences for satellite channels.

Viewership of informative programmes

Sizeable amount of viewership amongst all age groups was found for Discovery, National Geographic and Animal Planet, but it was not intentional. If intentional it was due to intervention of parents universities or project purposes.

Usage of Media for problem solving/ knowledge seeking

First option was Internet followed by books but audience responded that they would appreciate if any television channel would provide career guidance.

Children in the age group of 8-12 years had queries in science and felt that a television channel can also cover their syllabus.

Expectations from the New Channel

The following suggestions came from the feedback:

*Format:* Audiences prefer participatory shows in form of dial-ins, talk shows, quiz shows, this would also increase channel audience interaction.

*Programmes:* People asked for Informal approach in presentations, preferred outdoors and expected that it must not be restricted to studio. Presenter must be enthusiastic. More animations, visuals should be used and shows should be of short duration.

*Language:* Conversational, Simple and easy to understand.

*Subjects:* Wild-Life, latest trends in technology, automobiles, genetics, career guidance were few of the areas people asked for television programmes.

Recommendations

- Quality of transmission of Doordarshan must be improved. Many respondents expressed unhappiness with private channels but were also not happy with DD's quality.
- For the new channel publicity campaigns must be adopted; this can be done by roping in celebrities and experts. Role of TV in problem solving needs to be promoted since people still look at it as 'time pass' or entertainment.
- Continuity pattern must be followed in series, people voiced that they cannot follow serials for next episodes. One-time shows were preferred more. Convenient time slots for the shows were requested and repetition of content/programmes should be avoided.

## Perceptions of science education on TV in Hoshangabad

by Amman Madan, *Eklavya Institute of Educational Research & Innovative Action*

The questions sent by the organisers were made the basis of some open-ended group interviews in the field area of my ongoing study of local modes of public action.

The questions focussed on in the interviews were primarily the following:

- What was the pattern of television viewership?
- What kind of science themes did young people say they would want to watch on TV?
- What was the general understanding of the meaning of science?

### Methodological issues

A qualitative approach was followed, with an emphasis on trying to understand the general attitudes and perceptions of young people. The purpose of the discussion was described alongside some general chit-chat and their cooperation was requested.

Questions were posed informally and the children were encouraged to formulate their own responses in their own language, and not be constricted by the questions. Nor were they pushed to shape their responses to the specific questions on hand. The social and conversational skills of the last nearly 3 years of participative fieldwork in this region were used for this.

This present report may be seen as a set of case studies and does not seek to be representative of the entire variation in the field area. As such, it may be most useful in throwing up important issues for consideration and perhaps for future follow-up studies. It should not be seen as depicting the responses in an a way that is precisely proportional to their actual distribution in the community. The problem of respondents giving answers to suit what they thought the

interviewer was seeking to hear was largely kept under control among groups with whom I had been interacting in the past. We had already established grounds for trust and informality where they felt confident enough to tell me what they really thought.

In some groups where I was a new entrant to their social circle my novelty caused problems. Since I tried not to give leading cues the discussion would often grind to a halt while the respondents tried to figure out what I was looking for.

### The local context and the groups interviewed

The choice of people with whom the discussions were held was made on the basis of getting the widest possible coverage among the people I knew in the town of Hoshangabad and three nearby villages. The time available to me - about two man-days for interviewing - was the limiting factor in amount of the fieldwork which could be done.

Hoshangabad is a small town of a population of a little over one lakh, on the banks of the river Narmada, some 70 km to the south-east of Bhopal. It has come up primarily because of its being chosen as the district headquarters by the British and due to its being an importance as a pilgrimage town. The river Narmada is considered sacred by the local population and the town market benefits a good deal from the regular calendar of holy bathing for which large numbers of people come from surrounding areas.

The land around the town is very fertile and its agricultural wealth has sharply increased with green revolution technologies striking roots over the last two decades. Most trading of agricultural produce, however, takes place at Itarsi 17 km to the south, which has much better train connections to the rest of the country.

The major sources of employment in the town of Hoshangabad are in the government administration, a government run paper mill, in shops serving local and rural consumers, including kiriyana items, clothing and electronics goods and the educational sector.

Hoshangabad town has two post-graduate government colleges and several privately run ones. It is also an important centre for school education, with several large government and private schools. Farmers from the surrounding areas prefer to send their children to the town for studies, often renting or building homes there for this purpose.

The practice of building a house in the town has led to a construction boom in recent years. Electricity supply is more or less consistent, with a regular schedule of 2-3 hours of load-shedding at fixed hours in the morning. Discussions were held with a group of male college students in the town who regularly come to the Eklavya library there. We have been friends for some time and have been discussing various issues. They had a high level of general awareness and interest in things happening in the world, since they were preparing for competitive exams.

In the villages, caste continues to be a major factor in social relations, although some of its manifestations are gradually being eroded with the growth of the town and market relations and the steady work being done by the state. All the interviews were done at villages with relatively good road connections to the town. Electricity supply is for about 6-12 hours every day and is less regular and of poorer quality than in the town. These days electricity is available only in the night hours.

One of the villages in which interviews were conducted is called Nimsadiya and is very large (over 5000 residents) with its own small market. It has several large

castes of relatively equal strength so no single caste can dominate the village. There are also sizeable castes of landless labourers and marginal farmers. It has two private schools as well as government run primary, middle and high schools. The middle schools for boys and girls are separate. Most people who can afford it send children of the middle and high school levels to the town to study.

I have been running a library at a small private school patronised by an OBC caste of the village for the last one and a half years. The children there knew me well and I interviewed the class 5 children. This small private school charges a fee of Rs 40-50 per month and is being run in three rented rooms of two adjoining kutcha houses. The children were mostly from the families of small and middle farmers.

I also interviewed class 8 children of the government middle school for boys in this village. A school teacher here had been running a library supported by Eklavya till recently when he was transferred elsewhere. The class 8 boys were mostly from the families of landless labourers and marginal farmers. These children did not know me well, although they had seen me around. Class 9 students of the government high school, too, were interviewed. This is being run in a room of the middle school itself. This was a co-educational class and was a mix of poorer boys and relatively well off girls. There is a general pattern of sending boys to more expensive schooling while sending girls to the government schools. For these children, too, I was a relatively unfamiliar person. I also spoke to the class 7 and 8 girls of the government girls' middle school, for whom I was a completely new person.

In all the schools visited in Nimsadiya I was accompanied by a colleague from Eklavya. The teachers persisted in standing in the class while I spoke to the children and made the task of creating a

friendly and open atmosphere very difficult. Things were a little easier in the primary school since I already had some rapport with the children from earlier.

The second village visited by me was Jasalpur, which is a village of some 3000 residents, dominated by a single caste of Thakurs. I interviewed some Dalit boys here outside the school. I have been running a public library here in the school compound for two and a half years and these boys are now old friends.

In Jasalpur class 9 students of a small co-ed private school were interviewed. They are also old friends, since I ran a library here for about two years, which has now been taken over by a school teacher. This is by far the best school academically, with a reputation of getting very good scores in board exams. It is run in a kutcha building and charges between Rs 40 to Rs 70 as its fee. It is patronised largely by the sizeable OBC community in the village and by some Dalits.

The third village visited was Tugariya, a small village of Scheduled Castes and Scheduled Tribes, with a few OBCs, too. The residents are mostly marginal farmers who also supplement their earnings by working as labourers in the town. I have been running a public library here for the last nearly two years and interviewed two families that I knew well.

#### The patterns of television viewing

In the town there is a good overall availability of electricity and everybody other than the very poor has televisions and cable channels. The poor and the lower middle-class use black and white tv sets, which cost about Rs 1300-1400 for a locally assembled 14 inch set. There are two main cable channel suppliers. One operates from the large government housing colony serving the state-owned paper mill. This service provides most of the common channels,

including Star Plus, Star News and FTV. The second service operates from out of the main market of the town and was formed by the merger of two previously competing services. It does not show Star Plus or Star News and was forced by pressure from certain groups to stop the relay of FTV. Until very recently Discovery (in hindi) was being relayed by this service, but that has now stopped. The second service charges lower rates than the one being run in the government colony. The rates in the second service range from Rs 50 to 150 per month, depending upon whether the television set is b/w or colour and upon the negotiation skills of the householder.

In all the village schools, most of the children present said that they had televisions. Almost all of these were b/w sets. It was interesting to note that even in the Nimsadiya's boys' government middle school (where the children were almost entirely from landless labourer / marginal farmer families), most of the children said that they had b/w tv sets at home and had cable connections. However, television viewing is restricted to the evening hours by the availability of electricity.

In the villages, only one village - Nimsadiya - had a satellite channel service. The monthly charges there are Rs 40. The channels shown there are DD1, DD metro, Sahara, Sanskar, SAB and Zee TV. Nimsadiya, it is to be remembered, is a very large village.

In Jasalpur, a cable channel was started a couple of years ago with paid channels, including Sony and Zee cinema. The cable operator charged Rs 60 per home. However, I am told that people refused to pay up and the service was discontinued.

Tugariya is too small a village (about 50 houses) for it to be viable for a cable operator to set up services here. Nor is there any rich farmer here who would

consider it worthwhile to invest money for his own family's viewing and then pass out the signal to others. People here watch only DD1 and DD metro. The majority of houses have a b/w TV set.

Television is watched primarily, and usually exclusively, for entertainment. With the exception of the young men who were preparing for competitive exams I came across no one who spoke about watching TV as a serious activity engaged in to get something concrete out of it. It was always something which was fun, enjoyable and not directly connected with the everyday mundanities of life.

As such science education programmes packaged as entertainment, like those on Discovery, make a welcome change from the way science is taught in schools. The conventional school class on science makes it appear almost like drudgery - lots of facts to be mugged up and then reproduced under the threat of humiliation and punishment. If television is a space for entertainment in people's lives, then it provides an opportunity for deepening and enriching their perceptions of science and technology.

#### Appreciation of science themes

I got broadly four kinds of responses while talking to young people about what kind of themes they wanted to see in science programmes:

##### *1) Dull, mundane themes based upon the things being taught to them in science classes in school*

These responses were marked by a lack of any great enthusiasm while talking about the themes. They were most prominently to be observed in the four middle and high school classes of village Nimsadiya. The children mentioned themes like - about various substances, about minerals, about microbes, about carbon, etc. The way children were talking about these, it seemed to me that they were basically replying to me

within the framework of the expected responses of the classroom environment.

I do know that teaching in these schools is taking place at very poor levels. It emphasizes a forced learning kind of system, by which children are somehow sought to be made to mug up things and then regurgitate them through the exams. All these schools are understaffed and what teachers they do have are thoroughly demoralized. While I spoke to the children in these schools the teachers persisted in being present in the classroom or standing at the door. Often they would introduce me with an almost threatening tone to the students, exhorting them to give me the "right" answers.

##### *2) A sense of wonder*

Some children in the above schools were able to break through into a different kind of response. This was more like what I got from children in the Jasalpur school where the science teachers share an enthusiasm for their discipline. It was also what I would usually get when I spoke to children outside the school. This kind of response emphasized a sense of deep-rooted wonder and curiosity. It spoke of themes like why do stars twinkle - this is a question I heard again and again, always with a gleam in the speaker's eye and a tone of wonder in his / her voice. There were other questions too - why do clouds make the sound of thunder, why does the wind blow when it rains, why does snow fall and why does hail fall? They also spoke of wanting programmes on the moon, the sun and the universe.

Then there were themes which seemed to be coming from programmes which they had seen on television and from exciting parts of their school experience - the evolution of humankind, the various kinds of human beings, magnets (from girls in Nimsadiya who had actually played with magnets which came to their school through the Hoshangabad

Science Teaching Programme), the environment and conservation of forests, and the origins of agriculture. The seven wonders of the world were a common refrain.

The older boys of the town were the most articulate. They had seen a lot of Discovery and talked with enthusiasm of the kind of programmes they had enjoyed the most. These were mostly investigative programmes like FBI files, and programmes on the past like ancient forts, the Angkor Wat temple complex, and mummies.

The labourer / marginal farmer families I spoke to in Tugariya talked about the noon telecasts of Discovery with warmth. They enjoyed reminiscing about programmes on aquatic animals, ancient forts, ancient burials, submarines, how bears catch fish and early ape-like human beings.

A sense of wonder prevailed with a preference for themes that connected up with the known, but were yet exotic. This sense of the exotic (but not the completely alien) was rooted in local knowledge and cultures. There was a broad range of this varying from an elemental wonder about nature (stars, moon, sky) to a sensationalist curiosity (about the "fish that was the size of 30 elephants" - I presume this boy was talking about whales).

### *3) Control of the technologies of daily life*

Rather surprisingly, this was a minor element which surfaced only occasionally. Mostly this was expressed as a reference to learning more about agriculture-related topics, and that too almost as an after-thought without too much excitement about it.

The most enthusiasm about technology was shown by the older boys of the town who were avidly learning about things happening around the world while preparing for competitive exams. They were the ones who talked with the

most interest about new inventions and discoveries. These older boys also emphasized their sense of wonder about things which were poorly understood, but exciting parts of everyday life - stars, the universe. They made a clear distinction, however, between the exciting and the discouraging kinds of programmes. As one boy put it, he would be fascinated by a programme on why stars twinkled, but completely put off by a programme on why television sets twinkled.

On discussing this further the group agreed that they would like to understand how a tubelight functioned but only in language that they could understand - not with a "scientist who explained scientific theories about it". However, they emphasized, the level of science that such a programme should be built up on should not be more than that of class 8 level.

When I posed pointed questions to children about learning how a motorcycle worked or how a television worked, I did not get a very positive response. Perhaps this had to do with the fact that I was doing my interviewing in a largely rural context, and the cult of technology had not yet caught up there. Perhaps they would have been enthusiastic about some other technologies. There did seem to be a desire to better understand and control the technologies that they used in everyday life, but it seemed to be getting suppressed by the discouragement of classroom science teaching and also the sheer boring familiarity of many of these technologies.

### *4) Experiments*

The last kind of response was the only one to begin to approach the actual functioning of the scientific method, although in a rudimentary way. There was a spontaneous expression of interest in seeing scientific experiments on television by the groups which were the most comfortable talking about

science (the private school at Jasalpur and the older boys in the town). When I asked the private school children what kind of experiments they wanted to see, their faces lit up as they said that they wanted to see vernier callipers and screw gauges. On my asking them I learnt that they had recently been shown these instruments by their teacher and allowed to hold them in their hands.

For the older boys experiments were exemplified by the use of science in resolving mysteries, as shown on Discovery. They also referred to the excitement of the chase in trying to crack a scientific problem.

It should be remembered that the primary school children contributed almost nothing to the discussions on science education programmes on television. The primary school children of Nimsadiya unanimously cited cartoons as their favourite programme. They could not mention any science programme which they watched.

Even the term "vigyan" was not something which held any meaning to them. Their teacher later explained to me that they did not study science as separate discipline in primary school, since it had been merged into a separate discipline called "environmental studies". He emphasised that there was no programme on science aimed at the primary school segment.

#### Meanings of Science

When asked what they thought science meant, children's responses were centred around similar poles as their opinions on what kind of programmes should be shown:

##### *1) Science as knowledge.*

Most children of Nimsadiya gave me cautious replies, that it was knowledge of animals, plants and substances. This was a passive understanding, centring around the acceptance of the descriptive

knowledge that they read in the textbooks or heard from their teachers.

##### *2) Science as experimentation*

Some of the students at Nimsadiya, and most of the children I spoke to at Jasalpur and the older boys at the town would begin by saying firmly that science means doing experiments. This meant going and finding things out and resolving problems. Some of the older boys also emphasized that science meant the search for facts and the denial of myths.

##### *3) Science as technology*

The same children referred to science as making new discoveries and inventions. The emphasis on inventions was greater among the older boys. Nowhere did I hear a distinction between science and technology and they tended to be treated as one and the same thing.

#### Conclusions

It seems clear that science education programmes that educate while entertaining would fill a very important gap in our education system. They would correct to at least some extent the apathy or even distaste for science which the ordinary dull school-going experience creates. While this cannot replace the urgent need to reform our science education system, good science education TV programmes would help to keep an interest in science alive.

When planning programmes for a primarily rural district like Hoshangabad we must keep in mind the economic relations which govern the kind of television sets being used here and the reach of cable television. Black and white television sets would continue to be commonly used for several years to come. The size of a village would act as a definite filter for establishing financially viable cable connection services. Paid channels, too, are difficult to support at present in rural areas.

A basic minimum that audiences may expect is a programme that stimulates

and satisfies their sense of wonder. The programme must necessarily entertain and only through that be educative. The judgement of what would appeal to audiences would call for a documentary maker who combines good craftsmanship with the heart of a poet deeply rooted in rural society. This may well lead to different kinds of programmes appealing to different kinds of audiences. Therefore a very heterogeneous package of programmes would have to be built so as to hold the interest of a variety of audiences.

Many people do seem to be receptive to going beyond the exotica style of science education. The detective style narrative, for instance, strongly appeals to them. There would seem to be at least three major notions of the meaning of science education: a passive absorption of facts notion, an active wondering, curiosity-based model and an active interactive, experimental model. There is, therefore, space for exploring how to convey the scientific method itself through this medium. This would imply that along with catering to the active notion of curiosity and wonder, there should also be programmes that go to the heart of the scientific temper and exemplify the methods of science - rationality, empiricism, experimentation, etc.

The challenge is really not so much as how to copy the exotica of Discovery in Indian locales. The challenge is to actually try to convey the spirit of science - its premises, its methods, its problems and its pluralities. And to do this through connecting up with the many different local formulations of what makes one wonder, and to engage in a dialogue with the many local forms of examining evidence and ways of reasoning. The secular and democratic Indian state which seeks to base itself on an official ideology of science is in that sense one of the grandest experiments ever undertaken in the history of the world.

### Rapid Appraisal for TV viewers' perspectives

by Aisha Mahadeo Kawalkar, Homi Bhabha Centre for Science Education

Three schools, one science college and a young working group in Mumbai were selected for the survey.

- School 1: students of generally low socio-economic status (though higher than its neighbouring municipal school) Std. VIII, 8-12 years (5 boys, 5 girls)
- School 2: students of middle socio-economic status (belonging to one family). Std VIII -X, 12-15 years (2 girls, 3 boys)
- School 3: students of fairly high socio-economic status, with their parents having a scientific and technical background. Std VIII -X, 12-15 years (5 girls, 5 boys)
- College students: middle & higher class students of F.Y.B.Sc.(Biotechnology), S.Y.BSc (Comp. Sc.), 13-17 years (2 girls & 3 boys)
- Young working adults: were of higher middle class status. Education- B.Sc. (Comp. Sc.), M.Sc.(Botany), 2 B.E.(Electronics), B.E.(Comp. Sc.) (2 females & 3 males)

The responses were as follows.

1. Do you watch TV? Which channels are your favourites? Cable or Doordarshan? Which are your favourite programmes?

**School 1:** All of them watch TV, Cable & also DD.

Favourite channels-Discovery, Animal Planet, Sahyadri (DD), Star plus, Sahara, Cartoon network.

Favourite programmes: Kasauti, Kahani ghar ghar ki, Kutumb, Shakti, gharkul, Damini (serials), Chayageet; Aakrant, aap bita (horror), Dum duma dum, Shakalaka boom boom (children's program), CID officer, Homi Bhabha Programme on Sahyadri( they did not know I was from HBCSE ), Mega Movies Magic (how films are made).

School 2: Watch DD, as no cable at home. But do see cable at relatives' place & at their neighbours'.

Favourite channels: Cartoon network, Discovery, Animal Planet, DD metro.  
Favourite Programme- Cartoons; Ssh koi hai (horror), Jasoos Vijay, CID officer, Aankhen (crime based); All the best, Hum tum ek camera mein band ho (comedy); Shakalaka Boom, Discovery kids, Aryamaan (children's programme).

School 3: All of them watched TV, a couple of them were allowed to watch for restricted time in the evening. Mostly cable, found DD boring, not much variety, watched sometimes for news, cartoons & Aryamaan.

Favourite channels: Discovery, Animal Planet, National Geographic, Cartoon network, Tamil /Malayalam channels (Sun TV)

Favourite Programme: Not much specific on Animal Planet, National Geographic and Discovery, (Girls like those programmes on snakes, crocodiles, flowers, under water world more, while boys like those on machines and new technologies, like surgeries done with help of robots and space expeditions), Comedy (Comedy Times), Films, Horror (Aahat, Aap bitii), News on BBC/star/DD, Saturday unlimited (News of whole week), Children's programmes (small wonders), Aryamaan, Interviews of film celebrities.

College: Mostly watch cable. Standard of cable better, DD for News, Cricket.

Favourite channels: Discovery, M-TV, [V] TV, Discovery, ESPN

Favourite programme: not specific, keep surfing until find something interesting.

Working: Spend very less time watching TV. Mostly watch cable now, used to see DD earlier. Standard of DD low, no variety, for News & cricket.

Favourite channels: Discovery, National Geographic, Star Sports.

Favourite Programme- not specific.

2. *What is science? How can science help in daily life?*

School 1: Science is knowing environment, Knowing things by experimenting, getting information, observing, not believing in superstitions & finding reasons for them. Science is technology. Helps in daily life to maintain health, all the things we use like clothes, soap etc we get using science; Devices we use-TV, radio. Some students said only use of science in their daily life was gas stove & TV.

School 2: Science: By which you know how to maintain your health, about Machines & Technology, Get to know things.

Help in daily life- Vehicles, Appliances, Science tells you how to live.

School 3: Science: New inventions, makes life easy, gives comforts, man-made materials, observation of things, Appliances. Sometimes useful, may be destructive, helps to know things. Use in Daily life – Appliances

College: Study of things around us, Analyzing the events in nature. Appliances. Useful in every walk of life.

Working: Knowing how, what, why about anything, reason to problems. Justifying miracles of nature. Understanding natural phenomena & integrating them through institutions & practical knowledge. Technology is the application of science. Science cannot be separated from our life.

3. *What is the easiest way to understand science?*

School 1: Easiest way to understand science is experimenting.

School 2: By experiments, understanding basics

School 3: Concentrate and learn, do practicals.

College: Experiments

Working: Practical application in life, go through the basics, visualize the things.

4) If you don't understand a particular science problem whom do you go to?

School 1: Go to teacher, read books.

School 2: Teachers, parents, elder brother/sister

School 3: For problems, go to teachers, elders at home, books in library.

College: Teacher, Net, Books

Working: They used to go to their teachers with problems, seniors in college, Internet, books.

5) Could you tell us about any experiences that you may have had with problems or questions whose answers were difficult to find?

School 1: Had difficulty finding why shell of coconut( karvanti) burns quickly than wood.

School 2: No

School 3: Found difficult to understand - field concept of electricity, chemical equations, extraction of metals, how the past was (dinosaurs, fossils)

College: No

Working: Did not get satisfying answers about how airplanes fly, how they start.

6) Has it ever happened that you found a particular science topic difficult but after watching a related program on TV you could understand it better?

School 1: Programme on Human body, Animals, the time that Lord Krishna existed-on Discovery. How bulb works-Homi Bhabha programme. Hello Dr. Hello Sakhi! - Sahyadri

School 2: Earthquakes (programme on Discovery), Static electricity (UGC programme)

School 3: Thought snakes could see, but after seeing a programme realised snakes could not see; Global warming, currency.

College: Yes, DNA Fingerprinting on Discovery, Genes, DNA model

Working: Yes, UGC program by an IIT Prof. on Robotics, Quantum mechanics, Green house gases, nuclear weapons, human body, Lonely Planet-

Travelogue, Extinction of animals, Nutrition.

7) Does watching TV programmes on current issues like pollution, tree planting, drug addiction, HIV etc give you more understanding than just reading about it? Can you think of any such programmes that you have seen recently? Has any such program encouraged you to take remedial actions?

School 1: Yes (e.g. Hello. Dr on Discovery), not inspired by any programme to do something.

School 2: They said they did understand the current issues better by seeing related programs on TV. Eg. Jasoos Vijay (on AIDS), Awareness campaign on Polio, Short films on Gutkha/ cigarette smoking / alcohol.

School 3: Yes. Prog like Jasoos Vijay (HIV), Pollution and Deforestation on Discovery  
Planted tree, use jute bags instead of plastic

College: Yes. Programmes on Discovery about animals getting Extinct- Pashmina shawls & Pollution, Kiran Bedi's show about social issues. Usage of jute bags. But a single person cannot do anything, everyone has to join in.

Working: Yes. Stopped throwing tickets, wrappers etc on roads, utilising waste material for making something good, optimum use of paper.

8) What kind of programs do you watch during the course of the week?

School 1: Not clear.

School 2: Sundays reserved for films (especially girls)

School 3: Not clear.

College: Usually do not see TV on Sunday as they mostly go out.

Working: —

9) What formats do you like? Can you give examples of programmes using such formats?

School 1: Comedy, drama (Kkusum), Horror (Aahat)

School 2: – Entertainment (with children's' participation) E.g. Tarang on DD (Where Children play detectives), Suspense / Crime based E.g. CID Officer on DD, Horror (Aap bit), Comedy (All the best).

School 3: Interviews (would like Abdul Kalam's), Audience asking doubts to an Expert Panel, Chat shows (Big fight, Face to Face)

College: Film based, Dare shows with camera going on the streets, Chat shows where politicians are questioned.

Working: Chat shows like that of Karan Thapar, Big Fight, Comedy (Office office).

(The answers seemed to be related to the examples that were given to explain what was meant by Format)

10) *What is your favorite educational programme? What do you like or dislike about so-called educational programmes?*

School 1: Alpha scholarship, Balchitravani.

Dislike- Not much information that can be understood, not much expression on the face of the person speaking.

Like- the ones that give information.

School 2: Favourite Educational Programme - Earth Matters on DD, Programmes on Discovery like X-treme Machines, Duniya ki sair karo ( Travel-ogue), Balchitravani on Sahyadri – DD, Seek Peak (cartoon)- Shows how children should behave. Like them because they add to our knowledge.

School 3: UGC (Maths, making wall hangings), Robotics on National Geographic, on DD metro (Coil of wire for current). Dislike – Didn't explain well, should be child-oriented.

College: Sometimes see UGC programmes. Dull, uninteresting, but yes informative

Working: UGC , Earth Matters Usually not good enough to hold interest continually.

11) *If TV programmes were to be made based on your syllabus, what topics and formats would you suggest?*

*That is which are the subjects which you have difficulty with and need more material on?*

School 1: TV programs on syllabus should give how questions are asked in exams, give questions to solve for practice; Travelogues stressing on history of the place ( e.g. Bhatkanti on Sahyadri shows places like Raigad & gives more information on it). Should be in Marathi. (Their medium of instruction)

School 2: History— Plays on Shivaji, Freedom Struggle.

Science— on Force, Atmospheric pressure; should be explained using graphics, on Light Experiments. On Maths and English.

School 3: Programs on Syllabus – Subjects: Science, History, Astronomy (like shown on Discovery), Physics (based on Nuclear reactors), Maths (made interesting), Geometry (short cut tips to remember), Biology – Flowers, Human body. Should have well educated Host/Hostess, Speak clearly, Age doesn't matter, need not be glamorous, a little humor should be there.

College: Genetics- Graphics, talk by expert scientists

Working: Communication ( BE- Electronics), Updated knowledge in Computers.

12) *Do you think some programmes help you enhance your GK, which may help to get you through competitive exams for professional courses? Which ones?*

School 1: Yes. Like, Alpha Scholarship.

School 2: Yes. Programme which give latest information, including news.

School 3: Yes. Bourn vita Quiz, KBC, Nat GeoGenius (National Geographic), Animal planet programme, programme on human body, programme Related to Medical services.

College: Yes. Not only the ones which add to your GK but also Talk Shows, from which you can learn to speak fluently.

Working: Yes. Not only the ones which provide with new information & refresh knowledge, but also those which contribute to overall personality.

13) *Are you familiar with the internet? What are the websites you visit?*

School 1: Only heard about Internet, that it helps in communicating.

School 2: No

School 3: Heard about internet but never used it. Only one of them had used Rediffmail for emails.

College: Familiar with Internet. Use mainly Google to search for websites on desired subject. Visit espn, nature.com, molbio.com

Working: All of them familiar with internet. Websites – surf a lot of them, search websites on particular topic using google, use rediffmail, yahoo, indiatimes for e-mails. Look for online text books.

14) *Where do you go for information regarding courses of higher studies?*

School 1: Teachers and those already into desired field.

School 2: Elders, Institutes related to the desired field, people working in the field.

School 3: Relatives or other people (like family doctor) who have done the course, and not teachers as they will recommend their own subjects. Would like to see career related programmes on TV.

College: Net, seminars on related field, relatives who are in the field.

Working: Internet, career magazines & guide, friends who are in the field, related institutes.

15) *If you hear of a coaching class, how do you figure out its worth, whether the fees they ask are worth the quality of learning they offer?*

School 1: From results of coaching class students studying there.

School 2: Advertisements. in newspapers, friends / students studying in the coaching class.

School 3: Prefer private tuitions, would ask the fellow students about the class.

College: Students studying in the class

Working: Hearing from people studying there.

16) *What kind of a person would you go to for personal career advice?*

*What qualities does that person have, that you like and trust?*

School 1: The person should be well educated, loving, must speak clearly ("spasht vakta").

School 2: Reliable, Knowledgeable

School 3: Experienced person in the field.

College: Expert in the field

Working: One who would understand your aptitude and give adequate information of the requirements for the course & future scope.

17) *If you were to make a TV programme, or a series of them, for yourself and your friends what subject would you choose, and how would you make it interesting?*

School 1: Machines (Will tell about them interweaving in a story. Like a person ahead in a car race & his car suddenly has problem. Then he finds what the problem is, which is explained & then he joins the race again to win.). Handicrafts (show how they are made & show crafts Exhibition). Story which gives information about something. History (travelogue). Science (Show micro-organisms which cannot be seen through naked eyes)

School 2: Mixture of general knowledge & Enjoyment; *Historical* (like on Mummies of Egypt); *Science* – animals, spaceships

School 3: *Chemistry, Biology*- Flowers, Human body, Wildlife; Showing sonography/images of human body; *History*. Suggested format - Experts answering questions

College: *Genetics*- Make it lucid, if students understand they will feel interested. *Computers*- include recent developments, Commercial aspects, and future scope.

Working: Recent developments in Science, Economics – schemes for saving tax, Natural diversity of India.

#### Comments

1. Cable channels were preferred to Doordarshan which was considered to have no variety.
2. Students in the 8-12 years category did not have a clear idea of science; they considered Science to be the same as Technology. They thought the only help of Science in their daily life was that of appliances.
3. On current issues, though many of them were aware of the seriousness of the problems & the need for to work for their solutions but they thought that they could not change things alone. Hence there is a need for awareness/ to exemplify that an individual can make a difference/ give in some contribution.
4. All of them welcomed the idea of programs based on their syllabus, but wanted the programs to be more interactive.
5. In all the categories, a need for proper career guidance was felt.
6. The college students and young professionals were deeply interested to know the recent developments in science.

#### **Rapid appraisal for viewer's perspectives for the proposed science channel**

by Subha Das Mollick, St. Xavier's College, Kolkata

#### Responses of Group I

Group strength: 5  
Stream: humanities, age 19  
Income group: over 50,000/- per month  
Average hours of TV viewing per day: 4

*Salient features that came out of the discussion are:*

1. Most favourite channel: Channel V, followed by Star Plus, Sony and Zee in that order.
2. Never watch DD.
3. Often watch Animal Planet and National Geographic and enjoy them.
4. One girl recently watched a live programme on kidney transplantation while channel surfing and got glued to it – watched the whole thing.
5. They all found science very difficult in their school days. The reason for this, they say, is that fundamentals were never made clear. They have never watched purely science-based programmes, so they cannot say if such programmes would have helped them to understand the subject better. They all strongly feel that science cannot be understood without a teacher. A good science teacher can make all the difference.
6. They would never, on their own watch science-based programmes or other studies-based programmes on TV. But they would welcome such programmes being shown in class by the teacher and subsequently discussed.
7. Usually they don't have the patience to watch full one hour programmes of the National Geographic variety. But the programme they all remember is the one on Egyptian Pyramid, recently shown on N.G.
8. No, they have never been directly influenced by any TV programme into taking any positive step.
9. As for formats, they are open to all kinds of formats – talk shows to

music video, provided it is suitable for the topic. Certainly it should have interesting visuals and not be overladen with V.O.

10. Yes, television certainly increases their GK in all sorts of ways.
11. Yes, they all are totally dependent on the Net. For any reference work, that is the first and often the only source they tap.
12. If they join coaching classes, they go by the reputation of the class.
13. They would take career advice of successful professionals.
14. If they were to make TV programmes, they would do it on youth and current issues. "Be it anything but make it interesting".

#### Responses of Group II

Strength: 9;

Stream: humanities age: 20, 21

Income group: 25,000/- to 30,000/- per month

Average hours of T.V viewing per day: 4

#### *Salient features of the discussion:*

1. Favourite channels: Star Plus, Sony, Zee, Cartoon Network
2. For the boys, sports channels and news channels
3. They watch DD only if they know beforehand that something special will be aired on DD – like the current cricket series
4. Everyday at 9.30PM they watch a movie – usually on HBO
5. They all found science very difficult. They still remember some videos shown to them in class.
6. They feel science teaching should be interactive in order to be more effective.
7. They found many science topics difficult, but television never came to their rescue in making it easier.
8. They do watch Discovery or National Geographic, but never watch the full programme.

9. If programmes on syllabus based topics are shown on TV just before the exams, they would watch them.

10. They feel, ideal duration of such programmes should be 10 minutes, but if the subject demands, it should extend to 30 mins.

11. The ideal time for telecast of studies based programmes is 3 –4 PM or 7 –8 PM.

12. For reference work, most of them said that the Net was their first preference, but one student said that there was a lot of trash on the Net and it takes a lot of time and energy to sift out the substance from the trash.

13. For career guidance they would rely on a reputable face, one who has been recommended by good references and one who in turn can give good references.

14. They would look for the following qualities in a good educational programme and would try to do the same when they become producers:

- a) Good visuals
- b) Appropriately used graphics
- c) Comfortably paced
- d) Arouse curiosity
- e) Not too gimmicky
- f) Not too verbose
- g) Good presenter
- h) Enough humour
- i) Bring out the relevance
- j) Simple language

#### An interesting observation

A BBC programme called Fermat's Last Theorem was shown to both the above groups in class and analysed shot by shot. Everybody watched it engrossed and later came up with all sorts of interesting observations about the structure of the programme and why it works so well. Yet, all of them, except just one student said that they would not bother to watch the programme on TV.

**A pilot survey among children for proposed educational channel**  
 by Gauhar Raza and Surjit Singh  
 National Institute of Science, Technology and Development Studies (NISTADS)

**Characteristics of the sample**

Sample size 71 students, Class IX

- 32 students of Springdales School, Dhaula Kuan, New Delhi
- 39 students of Government Secondary School, Mangolpuri, Block-C, New Delhi

**Age-wise Distribution of students**

	School		Total
	Govt.	Private	
13 yrs	2.6%	6.3%	4.2%
14 yrs	33.3%	59.6%	59.2%
15 yrs	30.8%	3.1%	18.3%
16 yrs	17.9%		9.9%
17 yrs	15.4%		8.5%
Total	100.0%	100.0%	100.0%

**Education of Father**

	School		Total
	Govt.	Private	
Illiterate	17.9%		9.9%
5 to 9	30.8%		16.9%
10	25.6%		14.1%
11	5.1%		2.8%
12	12.8%		7.0%
14	2.6%		1.4%
15	5.1%	31.3%	16.9%
17 & above		68.8%	31.0%
Total	100.0%	100.0%	100.0%

**Education of Mother**

	School		Total
	Govt.	Private	
0	82.1%	3.1%	46.5%
5 to 9	15.4%		8.5%
12	2.6%	3.1%	2.8%
15		25.0%	11.3%
17 & above		68.8%	31.0%
Total	100.0%	100.0%	100.0%

**Occupation of Father**

	School		Total
	Govt.	Private	
N Reported	17.9%	3.1%	11.3%
Service	48.7%	46.9%	47.9%
Business	20.5%	21.9%	21.1%
Labour	10.3%		5.6%
Self Emp	2.6%	6.3%	4.2%
Professional		21.9%	9.9%
Total	100.0%	100.0%	100.0%

**Occupation of Mother**

	School		Total
	Govt.	Private	
Service	2.6%	37.5%	18.3%
Housewife	94.9%	34.4%	67.6%
Business		3.1%	1.4%
Labour	2.6%		1.4%
Self Emp.		12.5%	5.6%
Professional		12.5%	5.6%
Total	100.0%	100.0%	100.0%

**Family Structure**

	School		Total
	Govt.	Private	
Joint	25.6%	28.1%	26.8%
Nuclear	74.4%	71.9%	73.2%
Total	100.0%	100.0%	100.0%

**Family Size**

	School		Total
	Govt.	Private	
3		3.1%	1.4%
4	2.6%	53.1%	25.4%
5	20.5%	9.4%	15.5%
6	35.9%	21.9%	29.6%
7 & above	41.0%	12.5%	28.2%
Total	100.0%	100.0%	100.0%

**T2 Which channels are your favourites?**

Channels	School	
	Govt.	Private
Star World		53.0
Discovery	34.0	60.0
Star Plus	78.0	12.0
Sony	47.0	6.0
Zee	56.0	18.0
HBO		31.0
National Geographic		38.0
AXN		31.0
Aaj Tak	24.0	6.0

**T3 Why is it your favourite?**

	School		Total
	Govt.	Private	
Missing	17.9%		9.9%
Entertaining	2.6%	59.4%	28.2%
Educative	48.7%	15.6%	33.8%
Both		21.9%	9.9%
Others	30.8%	3.1%	18.3%
Total	100.0%	100.0%	100.0%

**T4 Which are your favourite programmes?**

Programmes	School	
	Govt.	Private
Full House		25.0
Ripley's Believe it or not		34.0
Friends		28.0
Guinness World Record		12.0
Sonpari	26.0	
News	26.0	

**T5 Which are your most favourite programme?**

	School		Total
	Govt	Private	
Missing	5.1%	3.1%	4.2%
News	30.8%		16.9%
Others	64.1%	96.9%	78.9%
Total	100.0%	100.0%	100.0%

**T6. Why do you like this programme?**

	School		Total
	Govt	Private	
Missing	12.8%	9.4%	11.3%
Informative	12.8%	31.3%	21.1%
Others	74.4%	59.4%	67.6%
Total	100.0%	100.0%	100.0%

**T7 Definitions of Science**

It is a branch of knowledge based on systematic study of humans, mankind, life and nature (16) (9)  
 It is organised body of knowledge that analyses universe in simple terms (2) (6)  
 Science is knowledge of the world based on facts  
 It is an art with definite methodology and logical thinking  
 It is study of things around us  
 It is that branch of knowledge which deals with why and how of (things around us)  
 It is (human) curiosity to know more and more  
 It knowledge that involves mathematical, logical and analytical thinking  
 Science leads to development (10)  
 Science leads to discovery (8)

**T8 How does science help us?**

It helps us in understanding processes, phenomena and laws of nature (16) (13)  
 Science makes life easy, replaces manual labour and civilises us (12) (14)  
 Prevents disasters  
 Helps in understanding how and why of things  
 Eradicates superstitions and inculcates rational thinking  
 Helps us to do what we do  
 Helps in logical thinking and gathering facts  
 Helps fighting diseases (4)

**T9 What is the easiest way to understand science?**

By performing experiments and by using it in daily life (20) (19)  
 By learning it through books (5)  
 By enjoying it, by taking keen interest  
 By analysing, questioning and observing  
 By learning through friends, parents and teachers (3) (7)  
 It should be taught in story format (3)

**T10 If you don't understand a particular science problem whom do you go to?**

	School		Total
	Govt	Private	
Missing	23.1%		12.7%
Parents	2.6%	28.1%	14.1%
Teacher	43.6%	37.5%	40.8%
Both	7.7%	28.1%	16.9%
Others	23.1%	6.3%	15.5%
Total	100.0%	100.0%	100.0%

**T11 Can you tell us about any question whose answer was difficult to find?**

	School		Total
	Govt	Private	
Missing	53.8%	56.3%	54.9%
Science	12.8%	40.6%	25.4%
Social Sts	5.1%		2.8%
Others	28.2%	3.1%	16.9%
Total	100.0%	100.0%	100.0%

**T12 Watching a related programme on TV could you understand the question better?**

	School		Total
	Govt	Private	
Missing	2.6%	6.3%	4.2%
Yes	71.8%	46.9%	60.6%
No	25.6%	46.9%	35.2%
Total	100.0%	100.0%	100.0%

**T13 Example cited.**

	School		Total
	Govt	Private	
Missing	46.2%	53.1%	49.3%
Science	17.9%	46.9%	31.0%
Environment	25.6%		14.1%
Others	10.3%		5.6%
Total	100.0%	100.0%	100.0%

**T14 Compared to books does watching TV enhance your understanding of current issues?**

	School		Total
	Govt	Private	
Yes	89.7%	87.5%	88.7%
No	10.3%	12.5%	11.3%
Total	100.0%	100.0%	100.0%

**T15. Can you think of any such programmes that you have seen recently?**

	School		Total
	Govt	Private	
Missing	25.6%	62.5%	42.3%
Krishidarshan	43.6%		23.9%
Others	30.8%	37.5%	33.8%
Total	100.0%	100.0%	100.0%

**T16. Has any such program encouraged you to take remedial actions?**

	School		Total
	Govt	Private	
Missing	2.6%		1.4%
Yes	94.9%	78.1%	87.3%
No	2.6%	21.9%	11.3%
Total	100.0%	100.0%	100.0%

**T17. What kind of programs do you watch during the course of the week?**

	School		Total
	Govt	Private	
Missing	15.4%	6.3%	11.3%
Film	15.4%	50.0%	31.0%
Others	69.2%	43.8%	57.7%
Total	100.0%	100.0%	100.0%

**T18. What formats do you like?**

	School		Total
	Govt	Private	
1 Film	10.3%	18.8%	14.1%
2 Serial	82.1%	15.6%	52.1%
3 Docudrama	7.7%		4.2%
4 Documentary		3.1%	1.4%
5 Interview		6.3%	2.8%
6 Otheras		6.3%	2.8%
1&2		21.9%	9.9%
1&3		3.1%	1.4%
1&4		6.3%	2.8%
1&5		6.3%	2.8%
2&4		3.1%	1.4%
2&5		9.4%	4.2%
Total	100.0%	100.0%	100.0%

**T19. Can you give examples of programmes using such formats?**

	School		Total
	Govt	Private	
Missing	33.3%	28.1%	31.0%
English Progs.		62.5%	28.2%
Hindi Progs.	66.7%	9.4%	40.8%
Total	100.0%	100.0%	100.0%

**T20. Which is your favorite educational programme?**

	School		Total
	Govt	Private	
Missing	12.8%	15.6%	14.1%
English Progs.		81.3%	36.6%
Don't watch		3.1%	1.4%
Hindi Progs.	87.2%		47.9%
Total	100.0%	100.0%	100.0%

**T21. Attitude towards educational programmes?**

	School		Total
	Govt	Private	
Missing	33.3%	15.6%	25.4%
Positive	66.7%	62.5%	64.8%
Negative		21.9%	9.9%
Total	100.0%	100.0%	100.0%

**T22. If TV programmes were to be made based on your syllabus, what topics would you suggest? That is which are the subjects which you have difficulty with, and need more material on?**

	School	
	Govt.	Private
Missing	23.1	
Literature	17.9	
Social Sciences	7.7	37.5
Science	51.3	62.5

**T23. If TV programmes were to be made based on your syllabus, what formats would you suggest?**

	School		Total
	Govt.	Private	
Missing	12.8%		7.0%
Film	2.6%	6.3%	4.2%
Serial	61.5%	43.8%	53.5%
Docudrama	20.5%	3.1%	12.7%
Documentary	2.6%	18.8%	9.9%
Others		28.1%	12.7%
Total	100.0%	100.0%	100.0%

**T24. Do you think some programmes help you enhance your GK?**

	School		Total
	Govt.	Private	
Missing	12.8%	3.1%	8.5%
Yes	64.1%	87.5%	74.6%
No	23.1%	9.4%	16.9%
Total	100.0%	100.0%	100.0%

**T25. Which programmes/channel help you to enhance your GK?**

	School	
	Govt.	Private
Discovery	38.0	25.0
Bournvita Quiz Contest		60.0

**T26. Are you familiar with the Internet?**

	School		Total
	Govt.	Private	
Missing	25.6%	3.1%	15.5%
Yes	10.3%	96.9%	49.3%
No	64.1%		35.2%
Total	100.0%	100.0%	100.0%

**T27. What websites do you visit?**

	School	
	Govt.	Private
Google		81.0
MSN		9.0
Hotmail		15.0
Yahoo		63.0
Altavista		15.0
ESPNStar		12.0
All Others		86.0

**T28. Where do you go for information regarding courses of higher studies?**

	School		Total
	Govt.	Private	
Missing	20.5%	31.3%	25.4%
Internet		40.6%	18.3%
Parents	28.2%	3.1%	16.9%
Teacher	30.8%		16.9%
Others	20.5%	25.0%	22.5%
Total	100.0%	100.0%	100.0%

**T29. What kind of a person would you go to for personal career advice?**

	School		Total
	Govt.	Private	
Missing	2.6%	12.5%	7.0%
Parents	56.4%	34.4%	46.5%
Teacher	30.8%	25.0%	28.2%
Others	10.3%	28.1%	18.3%
Total	100.0%	100.0%	100.0%

**T30 What qualities, does that person have that you like?**

	School	
	Govt.	Private
Kind		38.0
Intelligent	28.0	15.0
Experienced	6.0	40.0
Knowledgeable	9.0	43.0
Educated	21.0	
Smart	15.0	
Good Behaviour	18.0	

**T31 If you were to make a TV programme, or a series of them, for yourself and your friends what subject would you choose?**

	School	
	Govt.	Private
Science related	16.0	81.0
Others	84.0	19.0

**T32. How would you make it interesting?**

	School		Total
	Govt.	Private	
Missing	53.8%	9.4%	33.8%
Comedy	5.1%	28.1%	15.5%
Simple		25.0%	11.3%
Educative	17.9%		9.9%
Others	23.1%	37.5%	29.6%
Total	100.0%	100.0%	100.0%

**T31 If you were to make a TV programme, or a series of them, for yourself and your friends what subject would you choose?**

S No	Reported viewership	Govt School	Private School	Union	Intersection
1	Channels	21	24	31	13
2	Programmes	27	74	96	5
3	Websites	0	41	41	0

The choice of programmes and channels available on television is very large and viewership is quite dispersed. Children studying in Govt. and Private schools constitute two different universes and their intersection forms a very small set.

**Conclusions**

No firm conclusion could be drawn based on this preliminary study. A study of this nature needs to be administered at national level.

**Hypotheses for further study:**

- Factors that determine the choice of programmes seen by children are: socio economic conditions, nature of schooling, mother tongue, family sizes, education level and occupation of the parents
- None of the respondents mentioned Gyan Darshan as an educational channel.
- Most favourite channels of those who study in private schools are Star World and Discovery. Govt. schools students prefer to watch Star TV and Zee TV.

Though most children perceive teachers and parents as their guides, yet in Govt. schools, a large number of children did not see teacher or parents as problem-solvers.

More than half the respondents in both sorts of schools could not identify the subject where they face problems. About 40% children from the private school reported that they face problems in science subjects.

### Last session: detailed notes of group presentations

These are the full notes of the recommendations made by the four groups in the closing discussions. They are presented group-wise.

#### Group A

Gauhar Raza (NISTADS, Delhi), Gayatri Ayyangar (DECU, Ahmedabad), Gopi Desai (Film maker, Mumbai), Mohan Kumar (C-DIT, Thiruvananthapuram), Patricia Mascarenhas (Comet Media Foundation, Mumbai), R. G. Gade (DECU, Ahmedabad), Sagarika Golder (Researcher, Mumbai).

Group A proposed a system characterised by:

- a central authority for implementation and operations
- backed by a consultative structure composed of national, regional and local levels
- decentralised production with local stories in local languages and dialects
- qualified content experts to work on all programmes

The primary target audiences they saw for the channel were:

- Primary school students
- Secondary school students
- Higher secondary school students
- College students
- Artisans
- General audience

#### Content and Approach

- Interleaving of social science and hardcore science subjects
- History of science, health, environment, social sciences etc.
- Social awareness programmes
- Syllabus-oriented programmes as a substitute for private tuitions
- Emphasis on practical science
- Blasting misconceptions
- Biographies of eminent scientists
- Programmes on cutting-edge science
- Visits to science museums, laboratories, factories and other places

associated with science

#### Possible formats

- Docudrama
- Popular folk formats
- Animation and graphics
- Presentations by celebrities
- Demos and practical activities
- Quizzes
- Science news
- Outdoor location based programmes
- Career guidance programmes

#### Software generation strategy

- Large network of several channels should be established
- Each channel would have a local and regional language character
- Exchange of materials between these regional channels to allow language re-versioning of ready materials, so each channel has a large variety of materials at low cost
- Proper representation of all communities should be ensured
- Norms and guidelines for programmes should be stated clearly
- Quality control should be strict and transparent

#### Management

The group proposed the formation of a National Science Consortium (NSC)

This body would:

- appoint a CEO
- prepare the guidelines for the channel
- recommend a core committee of experts
- appoint a team of resource persons
- appoint producers
- appoint researchers
- appoint engineers and technical experts

#### Receiving end management

- DRS and PC at district level
- Formation of a monitoring and audience research cell
- Continuous feedback system

- Toll-free telephone lines
- Distribution through cable
- Off-line access and storage of data
- Resource persons at the receiving end to do audience studies

#### Multiple media strategy

- Interactivity through computers connected to television
- Scope for e-governance and e-literacy
- Transfer of programmes to various audiences through different media

#### Sources of funding for self sufficiency

- Government funding
- Private funding
- International agencies
- National agencies
- Media organisations
- NGOs
- Public service organisations
- Corporate houses

#### **Group B**

Deepak Verma (Mindarc Media, Delhi), Dharmesh Bhatt (DECU, Ahmedabad), Jeroo Mulla (Sophia Polytechnic, Mumbai), Meher Engineer (Paschim Banga Vigyan Manch, Kolkata), Mrunalini Jog (Comet Media Foundation, Mumbai), Nitin Bhavsar (DECU, Ahmedabad), Venkatesh Chakravarthy (Tamil Nadu Science Forum, Chennai), Vivek Monteiro (Navnirmitti, Mumbai).

Group B would like the primary emphasis of the Science Channel to be on basic needs, the uses of technology to facilitate these needs, and the science behind this. Television hitherto has been a medium that induces passivity, but they would like the Channel to reverse this by instigating viewers to ask questions and act.

They listed the qualities they would like the channel to have as:

- Scepticism, plurality and openness

- Concerned with meeting of basic needs against the potential of science and technology
- Questions must start from people, not channel
- Must emphasise doing rather than viewing—experiments, exercises and practice.

In addition, Group B said they endorse 4.3, 4.5 and 4.6 of the vision statement:

4.3 In more specific terms, the Science Channel will cater to both the formal as well as the non-formal sectors. Science taught in schools, colleges and professional institutes will definitely form a part of the Channel. Science happens in day to day life, in agriculture, in medicine, in nursing, in child care, in fighting disasters and so on will also form a very important part of the channel.

4.5 The National Science Channel will have a very broad canvas as the target population. The complex combination of languages, cultures geo-cultural specialities and lifestyles that is India will be the audience. Urban and rural; educated and otherwise; working and un-employed; men and women; young and old - all will be catered through some programming or other.

4.6 In addition to some programming of this pan-Indian nature, there will be section-specific programming targeting one or selected audience segments, and aired at time slots most suited to those specific segments like home-makers, senior citizens, students, physically or mentally challenged persons etc.

They also endorse 3, 4, 5, 6, 8 and 9 of Venkatesh Chakravarthy's paper, namely:

3. Science should not be addressed as, the be all and end all of all human travails. In effect, care should be taken not to fetishise science and technology or promote a scientific mode of thinking.

4. Science should be addressed as something that attempts to solve empirical problems and conceptual problems. In this, its failures must be given equal emphasis along with its successes.

5. A historical perspective must dictate the content of programmes but with emphasis on multiple histories and not some linear history of scientific progress.

6. Local knowledge, alternative research traditions and technologies must be given adequate space but in doing that care should be taken not to baptise some arcane method as science.

8. Scientific research never takes place as a dispassionate pursuit of truth even if that is what it is supposed to inspire; once it has been institutionalised in some form. Considerable amount of money and energy is spent rightfully no doubt in solving problems related to diseases like cancer and aids. However, a great deal of public funds is pumped into defence technologies in the name of science. Specific space must be therefore given for programmes to highlight the ethical and political aspects or consequences of scientific research.

9. Last but not the least, the Channel should not shy away from addressing the ecological damage produced by the disasters created by monumental aspirations connected with science and technology.

Keeping these in mind, they broadly endorsed the range of content identified in the background document, and their recommendations were as follows:

#### Content

- Science, culture and philosophy have to be linked and compared.
- Frontiers of science must be explored
- Science behind daily news or issues brought up by contemporary events must be examined

- Typical day to day rural practices that show understanding of the way materials behave, and what people have designed for their own convenience
- Women scientists, engineers and discoverers should be featured
- Place should be kept for school programmes, specially structured to enrich the formal curriculum, not to repeat the textbook content.

#### Approach

- There should be emphasis on the active participation of viewers, and programming must be designed accordingly:
- Centres where children can be brought to do experiments and other activities should be identified and equipped with low cost digital cameras so that they can be linked to the studio.
- There must also be provision for engaging with viewers through e-mail, postcards, and phone-in feedback facilities.
- One of the objectives of the channel should be to work with science clubs, ham radio clubs, astronomy clubs, trekking and adventure clubs and other activity-based groups, both to gain ideas from them and to strengthen them by projecting their activities and enthusiasms to wide audiences.

#### Format

- There could be an annual cycle called the science calendar, with special features pegged to various anniversaries like Ramanujam's birthday, or the day that Madame Curie discovered radium
- Humour, trivia, absurdities and paradoxes in science
- Outdoor expeditions and adventures
- Games and interactive experiments

#### Software generation strategy

- Build an elaborate virtual archive with references to existing stock materials from EMRCs, CIET, IGNOU etc. wherever they may be kept
- Engage independent producers on a massive scale, place copyrights with them, not the channel, and let them build up and maintain archives which get added to the virtual archive
- Encourage incorporation of amateur software into programmes, by putting out calls on different subjects.
- Encourage curiosity and activity by encouraging outdoor explorations e.g. study local environment, map your village etc. and create programme formats that show such things actually taking place.

#### Receiving end management

- Direct reception systems (DRS) interacting with specialists and facilitators in education institutions
- DRS to science clubs in urban and rural areas
- Different servers drawing from a state wide database
- Awards to science clubs where prizes are adventure trips
- Separate audience research teams have to be allotted for pre-telecast, during-telecast and post telecast feedback

#### Multiple media strategy

- Video on demand: through state-wise servers, where already telecast programmes can be viewed
- Website
- Linking to radio by way of FM channels
- Low cost booklets, science kits, audio cassettes and CD-ROMs should be published by the channel.

#### Self sufficiency

- Develop a corpus fund
- Solicit financial inputs from both

public and private corporate sectors

- Permit advertisements without compromising on the channel's freedom to comment on the consequences of a product
- Programmes can create their own merchandise like CD-ROMS, audio cassettes and kits.

#### Group C

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This group felt that the objectives of the channel must be:

- To demystify science
- To dispel the idea that science is the prerogative of a few
- To assert that every individual can practice science in everyday life
- To consciously treat technology as the visible face of science
- Not to overlook failures or the negative impacts of science

#### Content and approach

- A participative and collaborative approach of shared learning
- Enjoyable content, relating to everyday life & contemporary concerns
- Encouraging observation & analysis, rationality
- All experiments or processes demonstrated should be actually tried out, and shown in such a way that they can be done in practice
- Historical perspective to narratives
- Multidimensional, holistic and inclusive

#### Software generation strategies

- Create data bank of existing video material by surveying likely sources,

develop criteria to select appropriate material, identify agencies to undertake this study

- Make partnerships with individuals and institutions for content development and production
- Outsource productions, work out a transparent commissioning process, request for proposals through advertisements
- Take audience feedback for developing programme ideas and establish mechanisms for ongoing feedback once those are made

#### Receiving end management

- Time segmentation for different target audiences keeping primary target audience in mind
- Target groups identified: Students: primary, middle, high schools and University
- Non-students: out of school children and youth
- Adults: Home-makers, S & T professionals, senior citizens, farmers
- Synergise activities with people and institutions working for educational reforms
- Create mechanisms for participation of schools, NGOs, teachers for distribution and effective use, especially in rural areas
- Develop effective cable and satellite distribution in urban areas

#### Multiple media strategies

- Develop potential of non-broadcast media—bring out supplementary materials such as experiment kits, booklets, short reports etc.
- Package videos and CDs attractively with self-instructional material in print or via internet
- Make special websites, do video conferences, mail-in and phone-in programmes
- Do special programmes for teacher training, and then make programmes for children related to those contents

#### Self sufficiency

- Develop a brand identity
- Look at corporate sector for partnerships, not depending solely on government funds
- Make infrastructure available to different institutes and NGO centres to cut costs
- In return take ideas and material from them without research cost

#### Group D

Akhila Shivadas (CFAR, Delhi), Chandita Mukherjee (Comet Media Foundation, Mumbai), E.V. Chitnis (scientist, satellite communications expert, Pune), Hansa Joshi (DECU, Ahmedabad), Jayashree Ramadas (Homi Bhabha Centre for Science Education, Mumbai), M.L. Hasija (SAC, Delhi), Mira Desai (SNDT Women's University, Mumbai), P.V. Satheesh (Deccan Development Society, Hyderabad), Surojit Sarkar (film maker, Delhi), Tushar Kulkarni (Abhivyakti, Nashik).

At the outset the group decided that the channel should not be known as the *Science Education Channel* or *Shiksha Channel* or something similar as it would create an idea of bookishness and dullness. The subject is *Science for the People*, and the channel has to be projected as something of interest for everyone—dealing with the latest developments in science and technology and their implications for society, and looking at the processes through which these things came to be the way they are today.

#### Content

- Multiple perspectives on natural and social sciences, for science can't be isolated from social-political and cultural contexts
- Addressing contemporary concerns by linking with similar trends in the past
- Redefining traditions by examining parts of traditions/sciences/practices

which unite people & harmonise them with nature

#### Approach

Science is an integral part of society, but it gets trapped in other issues and becomes ineffective. To make sense to people, science must have a socio-economic context, for example, can we make schoolchildren in the rural areas more aware about the economic issues around them through an exploration of the relevant science and technology?

The suggestions included:

- Address specific audiences instead of being generic. What is specific in one situation can be understood by analogy by all others, but by trying to address all you address no-one.
- The auditory aspect of television has to be kept in mind. Not everything is watched, but the sound of it is on all the time.
- Empower audiences by dealing with problems of day-to-day existence such as water, environment, etc.
- Pre-test all pilot programmes and build procedures so that there is constant evaluation of the work, gauging of audience response and responding to it.
- Build mechanisms of immediate, continuous feedback to producers like market research organisations do for products.

#### Software generation strategies

The audience today is much more critical of the programmes as compared to the SITE days, 30 years ago. They have an array of channels to choose from, they have been well-exposed to varied formats and know what they like. The obvious path is to encourage the audience to decide the content of the channel and styling of the channel for themselves. To make this idea really work as a policy, the people behind the channel have to be oriented that way. This is possible today because of technological advancements, and there

are several ways this interactive and responsive channel could be built:

- By creating a large number of interactive programmes where the viewers themselves come on air, in phone-in, email-in and make on-camera appearances. Here, the programme acts as a facilitator of live discussions with the agenda being largely set by the viewers. In such programmes the viewers can talk directly to each other, and the anchor person becomes a hub, not the leader of the dialogue. This format is comparatively easy on the studio's budget.
- By having programmes so designed that audience members are invited to take part—quizzes, games, experiments and so on.
- By constantly inviting feedback, and responding to it seriously by altering programmes in response to the feedback, and publicly thanking viewers for their letters, creating a viewers' forum slot where channel policy could even be shared and referendums taken with audiences.
- By linking up with institutions and organisations having networks of contacts with a special shared interest, such as sky-watchers clubs or scouts and guides.

#### Channel profile/identity

- Participatory and interactive
- Actively re-position idea of science as academic pursuit into science as an aspect of daily living
- Create profiles of identified audiences for producers and constantly update them
- Current science news—as soon as any science and technology issue comes to public attention, there should be a prompt response from our producers, looking at the various implications of that issue
- Utilise local networks and resources, and become known for them. New suggestions will keep on coming from

such sources, giving the channel a unique character.

- Manage the channel to ensure democracy and participation in planning, management and execution stages.

#### Receiving-end management

There cannot be any universal prime-time slot in such a channel. Each member of the family may have his/her own TV viewing time, which could be catered to by the channel. For example:

- pre-schoolers love to watch TV early in the morning
- elderly people switch on TV sets in the mid-morning, after the active members of the family have left
- housewives watch TV in the early afternoon
- while children watch TV after school, in the late afternoon.

So, the channel could build the programming around a number of slots which would work as prime-time to people of different age groups and interests.

We could begin with special flagship programmes directed at the prime times of such specific audiences to define the channel. Gradually these time slots would develop identities of their own, and from these we could spin off entire channels later. Such as a children's science channel, a health channel directed at women, an environment channel for high school students, one for S&T professionals, and so on.

#### Multiple media strategy

In the climate of convergence of communications technologies, the channel could actively promote convergence, to its own advantage. It could maintain a website with programme information, facilities for viewing missed programmes, behind-the-scenes stories of productions, solicit feedback from viewers and recommend resources for further study, etc.

#### Self-sufficiency and management

While initial funding may come from ISRO and DST, the channel will have to look out for funding right from the outset, at a possible ratio of 50:50, government to non-government sources.

- They should try and generate their own funds and build a corpus with the help of the private sector and their own promotional activities and subsidiary activities such as publications, CDs, scientific toys and games.
- The channel should be known for its independent and autonomous structure and its integrity. It should be known as the only channel not obliged to please anybody—be it a government department, or a company or an NGO.
- It should have an alternate management structure to ensure democracy and participation in planning, management and implementation, and open-ness in the search for resources.
- There could be a structure that pulls in the constituents of a large consortium into a situation of rotating responsibility for implementation and day-to-day functioning.

#### Credo

The group had not formulated a credo as such, but they wanted the personality of the channel to include something which brings science and tradition together without being falling into obscurantism, divisiveness or endorsing superstition.

They would like to highlight the science in tradition and the way it creates a concordance between human beings and nature. They wanted us to seek out instances of practices which demonstrate harmony between people, and between people and nature and to create appreciation among young people for such traditions.