

Indian Journal of Science Communication

Communicating Science of Science Communication

**Climate change coverage in newspapers:
A comparative study**

**An evaluation of public communication
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**Public understanding and public engagement with
science, technology and innovation**

Children's perception about television programmes

Indian Journal of Science Communication

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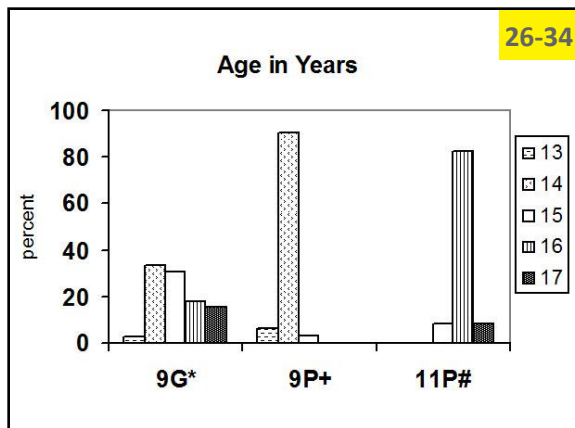
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Lycopene is a pigment that gives vegetables and fruits, viz. tomatoes, pink grapefruit and watermelon, their red color. It also appears to have strong antioxidant capabilities. Consumption of foods rich in lycopene is associated with a lower risk of prostate cancer and cardiovascular disease.

In a 1995 Harvard University study conducted with 47,894 men, researchers found that eating 10 or more servings a week of tomato products was associated with a reduced risk of prostate cancer by as much as 34 percent.



Sciencetoon

"You are from science back ground. Can you help me? My fiancée says I have black hairs, charming face, and my lips- he says they are just like Lycopene.....what's that?"

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Diverse Perspectives in Science Communication



Public communication of science, research and development is not the job of scientists only, it requires a common ground to be developed by experts from diverse fields to evolve it truly as an interdisciplinary area of knowledge. Equal participation and contribution of scientists, technologists, communicators, and specialists from socio-cultural sectors will ensure the overall and inclusive growth of the area to serve the very purpose of science communication. The field is growing so as the challenges, and therefore the field of public communication of science and technology has to be examined and looked at from diverse perspectives, i.e., scientific, technological, mass communication, socio-cultural, and political.

Science and technology have no territorial boundaries and similarly science communication is being benefitted largely by enhanced interaction and sharing of knowledge and experiences at global forums as well. India is one of the fast emerging economies of the world on move. Science and technology interventions are instruments of accelerating the pace of growth and if it deeper percolates into the society can get more edges to strengthen and build capacities amongst citizens to be able to contribute to the mainstream of development. The plurality and commonality of needs, concerns and challenges offer opportunities for emerging nations to joining hands and synergizing efforts in the area of public communication of science and technology to benefit the people at large.

Science communication in emerging nations, i.e. India, Brazil, South Africa, and China, is developing fast may be because of the fact that it keeps pace with the developments taking place in different sectors, such as research and development in leading edge science and technology, agriculture, environment, industry, computers, education, social welfare, mass media, service sectors, and so on. These states have remained the centres for science and its propagation for a long time in the modern world as well. The urge for scientific explorations as well as sharing its excitement with the public has been very common throughout. Similarly, a combination of creativity driven science and media has been able to lay down the foundations of rich science communication cultures. They are poised with many challenges that offer opportunities and possibilities in science communication.

A comparative assessment suggests that Brazil and South Africa are following the western model of public communication by and large involving 'the science museums, planetariums, exhibitions, lectures, audio-video media and high-end technological application' approach. Whereas, in India and China, 'folk forms, print and visual media, road-shows, and people's involvement' approach, proves to be cost effective and fits into social milieu of these countries.

Another observation has revealed a strong research base and shows encouraging trends for undertaking innovative research projects in diverse areas of public communication by scholars and researchers, as evident from the presentations at the PCST conferences; it offers fabulous opportunity for scholars to learn and share, amongst others, the innovative ideas and best practices from experts from different countries and diverse disciplines. The 13th Public Communication of Science & Technology Conference (PCST-2014) on focal theme "Science communication for social inclusion and political engagement" was organized in Salvador, Brazil during May 05-08, 2014, which is yet another encouraging addition towards this direction.

If scientific literacy implies disseminating knowledge of science, its wonders, its scope, and its applications, etc., then perhaps in the context of these emerging nations, the scientific and technological temper has more meaning and relevance to add value. What we would like to see is that our populations at large develop a scientific outlook rather than being told about facets of science alone that allows informed and logical application of science and technology and elimination of superstitions and ignorance. Therefore, more organic approach has taken shape and making inroads.

There is a need of building knowledge networks through collective wisdom and mutual dialogues on science, technology, culture, and society for promoting a diverse approach in public appreciation of science. All those who are willing for a better and fair world and to overcome ignorance can join this movement of construction of knowledge networks, by involving people through hands, minds, hearts and souls in the direction of sustainability and enlightenment! It is going to be immensely resourceful for researchers and practitioners of science communication and will pave the way for scholarly discourses to help bring further insights and advancements for addressing science- society issues especially amongst emerging economies of the world!

Dr. Manoj Kumar Patairiya

Climate change coverage in newspapers: A comparative study of *The Hindu* and *The Times of India*

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Communicating climate change is one of the important functions of the mass media because it plays role in not only creating awareness among the public but it may also influence people take necessary actions to mitigate problems or to adopt to extreme conditions. Journalists have a special responsibility in communicating such a global issue. Climate change coverage in newspapers has to be done in both global and local context. Such an environmental issue needs to be communicated in a simplified manner for the better appreciation of the public. The study was conducted to understand the effectiveness of print medium in covering climate change news in Chennai with special reference to two English newspapers, The Hindu and The Times of India. Content analyses of these newspapers were done for a period of three months from November 2009 to January 2010 to study the number of articles being published and the importance given to climate change. The analysis of the climate change articles gave a clear insight into the coverage of climate change.

Keywords: Climate change communication, content analysis, print media coverage

Introduction

Climate includes patterns of temperature, precipitation, humidity, wind and seasons. ‘Climate change’ affects more than just a change in weather; it refers to seasonal changes over a long period of time. These climate patterns play a fundamental role in shaping natural ecosystems, and the human economies and cultures that depend upon them. Because so many systems are tied to climate, a change in climate can affect many related aspects of people,

plants and animals, such as food production, availability and use of water, and health risks. Effective communication is necessary to generate a positive response and solution to this issue.

Climate change in India

Climatologists describe climate change as the biggest challenge humans have ever faced, and warn that the issue needs to be addressed immediately to avert its consequences. Climate change is already happening and it represents one of the greatest en-

vironmental, social and economic threats facing the earth. Climate change refers to any significant change in measures of climate (such as temperature, precipitation or wind) lasting for an extended period (decades or longer).

We should be concerned in India about climate change since this phenomenon might have substantial adverse impacts. Not all possible consequences of climate change are yet fully understood, but the three main 'categories' of impacts are those on agriculture, sea level rise leading to submergence of coastal areas, and increased frequency of extreme events, posing serious threats to India. However, these are long term issues. The overriding immediate concern for India should be the fast pace at which negotiations are taking place on the climate front. India's main energy resource is coal. With the threat of climate change, India is called upon to change its energy strategy based on coal, its most abundant resource, and to use other energy sources (e.g. oil, gas, renewable and nuclear energy) instead, which may turn out to be expensive. Thus, an immediate issue is to come up with a better negotiation strategy such that we have more freedom to decide which type of energy we use, how we generate power, how to reduce methane emissions by agricultural practices or forestry and so on. Negotiations are important for us as a means to reduce or postpone future vulnerability by getting the developed countries to reduce their emissions.

Precisely at a time when India is confronted with development imperatives, India will also be severely impacted by climate change. Like other developing countries, several sections of the Indian populace will not be able to buffer themselves from impacts of global warming. With close economic ties to natural resources and climate-sensitive sectors such as agriculture, water and forestry, India may face a major threat, and require serious adaptive capacity to combat climate change consequences. As a developing country, India can little afford the risks and economic backlashes that industrialized nations can. With 27.5% of the population still below the poverty line, reducing vulnerability to the impacts of climate change is essential.

The future impacts of climate change, identified by the Government of India's National Communications (NATCOM) included the following:

- Decreased snow cover, affecting snow-fed and glacial systems such as the Ganges and Brah-

maputra. 70% of the summer flow of the Ganges comes from melt water.

- Erratic monsoon with serious effects on rain-fed agriculture, peninsular rivers, water and power supply.
- Drop in wheat production by 4-5 million tones, with even 1°C rise in temperature.
- Rising sea levels causing displacement along one of the most densely populated coastlines in the world, threatened freshwater sources and mangrove ecosystems.
- Increased frequency and intensity of floods. Increased vulnerability of people in coastal, arid and semi-arid zones of the country.
- 50% of India's forests are likely to experience shift in forest types, adversely impacting associated biodiversity, regional climate dynamics as well as livelihoods based on forest products.

Role of media in communicating climate change

Communicating the importance of climate change has always been difficult, given that it is a slow process that doesn't have any particularly tangible thing on which to hang the message. Informing the public about the urgency of the issue, and educating them about the policy options and personal and commercial means for responding is a challenging task for communicators given the following barriers:

- Public understanding of the causes and consequences of climate change is low, as is awareness of the methods that can mitigate with its effects;
- Action has been hampered by political partisanship and industry disinformation campaigns;
- Principles of fairness in news coverage have given a far greater voice to the handful of skeptics than is merited by either their numbers or their evidence; and publication of their views has fostered a widespread perception in the public of scientific controversy, where none actually exists;
- The issue remains a low policy priority, and is likely to remain so until the perception of controversy is overcome and people clearly understand both the dangers we face and the actions we must take to avert the dangers.

The extensive coverage can provide farmers and ru-

ral communities with a scientific explanation for the dramatic weather changes that they had been witnessing in recent years. But while such high-profile occurrences captured the public imagination and generated intense debates on the impacts of environmental degradation on people's day-to-day lives, the momentum generated was not sustained. The media has continued to focus on the 'big' stories such as deaths from drought, or the destruction caused by floods, with little information being provided on how to cope with the effects of climate-related changes. Few journalists - or even editors, who are the gatekeepers of stories that go on air or into print - have a clear grasp of the science behind this phenomenon. On many occasions, science-oriented stories, as well as those covering forestry, agriculture, and climate change, get 'spiked'. Publishers prefer stories about crime, violence and political scandal because this is what sells.

Objectives of the study

- To analyze the print media coverage of climate change in *The Hindu* and *The Times of India* from October 2009 to January 2010.
- To compare the climate change coverage in *The Hindu* and *The Times of India*.

Environmental issues like climate change have to be reported with utmost care as they often require background research. Climate change is reported in most of the newspapers around the world.

Environmental reporting

Environmental reporting is different from general forms of reporting. *The Reporters Environmental handbook* consists of chapters for environmental issues like pollution, soil, land resources, climate change, ozone depletion, etc. Under each category, the author describes the following: background information about the topic, how to address the issues, important point for researching a story, avoiding pitfalls and also a list of information sources related to the issue.

Avoiding pitfalls

- Avoid equating global climate change solely with carbon dioxide emissions. The issue is

much broader.

- The issues of global climate change and stratospheric ozone depletion are often confined. Ozone and CFCs are involved in both issues.
- There remains a wide range of opinion about the science of global climate change, especially in the United States. Avoid taking a single point of view.
- Temporary extremes in temperature and weather cannot necessarily be used as direct evidence of global climate change. The widespread reporting of the presence of open water at the North Pole in August 2000 is a case in point. The observations of two scientists who had crossed the pole while on a tourist cruise were widely reported as evidence of global warming. Ten days after the story first appeared, it was retracted. Further investigation indicated that, while measurable increase in arctic temperature have occurred over the past 30 years, the presence of open water at the pole was neither a news event nor was it particularly alarming to scientists who study climate change.
- Avoid focusing on solely technical solutions without acknowledging that many are untried. They too, may cause climatic or other problem.

Many editors and newsrooms find it particularly difficult to deal with the environmental beat (or assignment) for two reasons. First, as the unobtrusive nature of many environmental problems makes it hard for reporters to fit these stories into conventional news formats. Second, environmental news can be difficult to report because few reporters have training in science and knowledge of complex environmental problems such as groundwater pollution, animal waste, urban sprawl, genetically modified crops or cancer and disease clusters (Cox 2006).

One of the most important gatekeeper practices that affect environmental news reporting is what editors describe as the news value, or newsworthiness of a story. Newsworthiness is the ability of a news story to attract readers or viewers. Cox explains that reporters and editors are likely to draw one or more of these criteria for selecting, framing and reporting environmental news:

- Timeliness
- Proximity
- Impact
- Magnitude

- Conflict
- Oddity
- Emotional impact

Uncertainty in reporting climate change

Climate Change, an important environmental issue also suffers high competition from other news to find a place in the newspapers. There is also enough confusion which exists in reporting such a complicated issue. Stephen C. Zehr (2000) addresses the representation of scientific uncertainty about global warming and climate change in the U.S. popular press. A study of US newspaper and magazine coverage from 1986 through 1995 – in *The New York Times*, *The Wall Street Journal*, *The Chicago Tribune*, and *The Los Angeles Times* and unspecified magazines from the popular press – found that uncertainty was consistently prominent theme in reporting.

An examination of popular press articles about global warming from 1986 to 1995 revealed that scientific uncertainty was a salient theme. The paper describes several forms of uncertainty construction and means through which it was managed. It is argued that scientific uncertainty was used to help construct an exclusionary boundary between “the public” and climate change scientists.

Anabela Carvalho, and Jacquelin Burgess (2005) conducted an empirical study which identifies three distinct circuits of climate change—1985–1990, 1991–1996, 1997–2003—which are characterized by different framings of risks associated with climate change. A critical discourse analysis of climate change based on a database of newspaper reports from three U.K. broadsheet papers over the period 1985–2003 was presented. The article concludes that there is evidence of social learning as actors build on their experiences in relation to climate change science and policy making. Two important factors in shaping the U.K.’s broadsheet newspapers’ discourse on ‘dangerous’ climate change emerge as the agency of top political figures and the dominant ideological standpoints in different newspapers.

The analysis presented focuses on *The Guardian* (and the Sunday broadsheet *The Observer*), *The Independent* (including *The Independent on Sunday*), and *The Times* (including *The Sunday Times*). The choice of newspapers results from interest in examining, as fully as possible, developments in the arguments and perspectives of various social actors

on climate change. Debate is excessively simplified or excluded in other media. Furthermore, the selected newspapers have an important power of ‘agenda-setting’ for decision makers, politicians, the public, and the other media in the United Kingdom.

Problems in reporting climate change

Mike Shanahan (2009) conducted a study on 111 Journalists from 35 nations of Africa, Asia, Latin America, the Caribbean, and the Middle East barriers they faced in reporting climate change. All reported on climate change (with varying frequency) but only 35 (31%) had received any formal training about the subject, usually in the form of short workshops.

Beyond the lack of training, the main problems they reported were:

- A lack of local research and news and of local experts who are prepared to talk to journalists (35%);
- Difficulties accessing information and understanding the subject (35%);
- Difficulty persuading editors that climate change stories matter (29%);
- Insufficient resources for travel to remote areas or to relevant conferences (21%).

The media are important sources of information. It is also said that reporters who work on environmental beat have accurate knowledge on climate change. But, it is not the same in all the cases. Reporters who primarily use scientists as sources and who work in the environmental beat full-time have the most accurate climate change knowledge (Wilson, 2000).

Frequency of climate change coverage in newspapers

Luisa Massarani in the *SciDev.Net* has written that “Brazilian newspapers are covering climate change more frequently”, according to a study published. The study carried out by the News Agency for Children’s Rights and supported by the Climate Change Communication Programme at the British Embassy in Brazil, evaluated a sample of 997 articles, comprising news articles, editorials, features, columns and interviews from 50 publications published between 1 July 2005 and 30 June 2007.

The authors found that one article was published on the theme every two days in the last quarter of 2006 onwards, while one article was published every five days at the beginning of the time period. According to the study, the environmental perspective is the main angle from which the media cover the issue (35.8 per cent), followed by looking at the economic impact (19.7%). Only two per cent of texts highlight the specific impacts of climate change on low-income populations.

Newspapers also prioritize reporting the impacts of climate change over understanding what is causing it and ways to address the problem. Around half of the stories that mention a specific location deal with the international scenario alone or its relation to the Brazilian context; the rest focus on climate change in Brazil.

In general, journalists consulted a variety of sources. The most popular were public authorities, experts, technical and academic institutions, private companies and foreign governments. But only 9.5 per cent of articles presented contrasting opinions, and 28.5% didn't mention the sources of information they used.

The authors of the study write that the results should contribute directly to advances in the strategy used by the media to cover climate change. "They are, at the same time, relevant for expanding the dialogue between different sources of information and media outlets on this issue," they add.

Claudio Angelo Monteiro, science editor of one of Brazil's national newspapers, *Folha de São Paulo*, highlights a limitation of the study. He told *SciDev.Net* that analyzing large national newspapers in the same 'bag' as small local newspapers means that it is hard to see specific trends in national newspapers such as *Folha de São Paulo* and *O Estado de São Paulo*, which have impact on the political agenda.

Difficulties in science reporting

Reporting climate issues is complicated because of the other issues like Green House effect, Global Warming which are closely linked with climate change. The business of journalism has been seen to have an impact on how science information is delivered to the public; the inherent business focus on profits trumps the notion of public welfare. Fewer reporters are available to provide in-depth coverage of scientific and environmental issues. The reports

are having a difficult time making it into newspapers, since science news is not seen to attract as much attention or sell as much advertising as other kinds of stories. Finally, in an effort to get attention, the stories that are told risk being sensationalized.

Despite the rise of electronic media, the print news media continue to provide an important source of science news to the lay public. In fact, because the news media influence public opinion, the press is often used strategically by researchers seeking attention and funding, and by advocates seeking policy change. The lay press is also an important source of information on new research for the scientific community.

Print media coverage of Green House Effect

Global warming alone does not explain global climate change if looked at without recognising the dimming effect of black carbon emissions on global climate change. Following brief reviews of (a) the decisive role of the media in American politics and (b) earlier studies of media partiality and superficiality, Moti Nissani (1999) examines media coverage of the greenhouse effect. It does so by comparing two pictures. The first picture emerges from reading all 100 greenhouse-related articles published over a five-month period (May–September 1997) in *The Christian Science Monitor*, *New York Times*, *The San Francisco Chronicle*, and *The Washington Post*. The second picture emerges from the mainstream scientific literature. This comparison shows that media coverage of environmental issues suffers from both shallowness and pro-corporate bias. The biospheric implications of these two flaws are touched upon.

Reporting climate change

In addition to media ownership, issue characteristics also affect media reporting. S. Ungar (2000) conducted a comparative study looking into the framing of climate change versus the framing of the ozone layer hole. His main conclusion is that climate change lacks a marketability component, which the ozone layer problem had. More specifically, it is complicated to use a single metaphor to describe climate change because of the complexity of the issue and the number of problems attached to it. On the other hand, the ozone layer hole was easy to describe by using metaphors related to the penetration of an outside force into our planet that

is bringing catastrophic consequences, especially to humans. This issue has big implications to agenda setting research because under a social constructivist lens, it suggests that not only frames and issue characteristics matter, but also a more abstract level of analysis is needed, one that includes the ability of an issue to use collective metaphors that appeal to the public and policy makers.

The ozone threat encouraged the acquisition of knowledge because it was allied and resonated with easy-to-understand bridging metaphors derived from the popular culture. It also engendered a “hot crisis.” That is, it provided a sense of immediate and concrete risk with everyday relevance. Climate change fails at both of these criteria and remains in a public limbo.

Methodology

Content analysis is a research technique for making replicable and valid references from data to their context (Krippendorff, 1980). This methodology was chosen for conducting the study. Content analysis consists of analyzing the contents of documentary materials such as books, magazines, newspapers and the contents of all other verbal materials which can be spoken or printed. Content analysis involves identifying coherent and important examples, themes, and patterns in the data. An analysis of relevant media content is necessary in order to determine the importance of news topics. Content analysis prior to 1940’s was mostly quantitative analysis of documentary materials concerning certain characteristics that can be identified and counted.

Population

Newspaper articles on climate change from November 2009 to January 2010 were analysed for the study. The time period is crucial because newspapers were engaged in reporting about the events related to the climate summit. It also covered each nation’s stand regarding climate change and their reactions after the summit.

Parameters for analysis

An analysis of the content of climate change news, published by *The Hindu* and *The Times of India* was conducted from November 2009 to January 2010. The climate change content in the newspapers was

analyzed. The parameters used for qualitative analysis are Placement/Position, Special Report/Full Page, Timing, Source, Space, Style, Type of Climate Change Content, Climate Change news with pictures, Human subjects in picture, Use of Graphics/Illustrations, and Research findings in news item. The following parameters are to be analysed qualitatively: Type of news, Issue, Sources or reference, Technical terms or acronyms used, and Themes.

Analysis and interpretation

Content analysis of climate change news:

The total climate change news in *The Hindu* and *The Times of India* from November 2009 to December 2010 are as follows:

	<i>The Hindu</i>	<i>The Times of India</i>
Climate Change news	1.42 %	1.62 %

Table 1. Total climate change news in *The Hindu* and *The Times of India*

Timing: The month wise climate change coverage in the newspapers *The Hindu* and *The Times of India* from November 2009 to December 2010 are as follows:

Climate change news	November’09	December’09	January’10
<i>The Hindu</i>	24.21 %	64.84 %	10.15 %
<i>The Times of India</i>	9.58 %	78.08 %	12.32 %

Table 2. Month-wise climate change coverage

Placement/ Position: Climate change news appeared in different pages of the newspaper. They can be classified as follows:

Placement/Position	<i>The Hindu</i>	<i>The Times of India</i>
Front page	14.84 %	13.01 %
Editorial	17.18 %	6.84 %
Supplementary	3.90 %	0.68 %
Cartoons	-	0.68 %

Regional/National/Times Nation	42.18 %	55.47 %
International/Times Global	9.37 %	15.06 %
Science & Technology/Times Trends	8.59 %	7.53 %
Letters to the Editor	3.90 %	0.68 %

Table 3. Placement/ position of climate change news

Special Column/ Full Page: It is found that climate change news is presented in a special column or as a separate full page article. For example, the respective news articles are classified under a special column named as ‘Copenhagen calling’ or ‘Countdown to Copenhagen’.

Special Column/Full Page	Yes	No
<i>The Hindu</i>	1.56 %	98.43 %
<i>The Times of India</i>	44.52 %	55.47 %

Table 4. Climate change news as special column/ full page

Style: Both newspapers use different style of presentation like using bullets points or presenting news story inside a box. For example, in the article titled, “Copenhagen Finally Throws up Deal.” in the newspaper *The Times of India* published on 20 December, 2009 describes the pluses and the minuses of the climate accord in bulletins.

Style	Yes	No
<i>The Hindu</i>	21.09 %	78.90 %
<i>The Times of India</i>	28.08 %	71.91 %

Table 5. Total articles where different style adopted for climate change coverage

Source: The source of the news is either the reporter or the agency. Apart from reporters and agencies reporting the news stories or events related to climate change many scientists; nobel laureates comments on the issue did find a place in the newspapers like Elinor Olstorm (one of the nobel prize winner for economics), Ravi chellam (Country Director, Wildlife Conservation Society-India Program), etc. The same is followed in the newspaper, *The Times of India*,

for example, the article titled, “Developed Nations are the Reluctant Party at Copenhagen Meet.” published on December 7, 2009 in *The Times of India* was written by Sunita Narain, Director, Centre for Science and Environment.

Source	<i>The Hindu</i>	<i>The Times of India</i>
Reporter	29.68 %	69.17 %
Agency	16.40 %	15.06 %
Others	53.90 %	15.75 %

Table 6. Sources of climate change news

Space: Column centimeters occupied by occupied by text in the newspapers *The Hindu* and *The Times of India* is as follows:

Text Space	<i>The Hindu</i>	<i>The Times of India</i>
0 - 25%		
25 - 50%	11	4
50 - 75%	29	17
75 - 100%	102	104

Table 7. Total space occupied by text

Column centimeters occupied by pictures in the newspapers, *The Hindu* and *The Times of India*.

Picture Space	<i>The Hindu</i>	<i>The Times of India</i>
0 – 25%	18	73
25 - 50%	17	23
Picture Space	<i>The Hindu</i>	<i>The Times of India</i>
50 - 75%	1	3
75 - 100%	1	4

Table 8. Total space occupied by picture

Type of climate change content: Climate change content in the newspapers *The Hindu* and *The Times of India* can be classified into three divisions like:

- Copenhagen/Emission cuts
- Glaciers/Global warming/Green House Effect
- Others – Campaign/Programs/Inauguration

Type of Climate Change Content	<i>The Hindu</i>	<i>The Times of India</i>
Copenhagen/Emission cuts	68.75 %	69.86 %
Glaciers/GW/GHE	20.31 %	25.34 %
Others	10.93 %	4.79 %

Table 9. Type of climate change content

Climate Change News with Pictures: Climate change news is accompanied with photographs or without photos. They can be classified as follows:

Climate Change News With Pictures	<i>The Hindu</i>	<i>The Times of India</i>
Colour	64.06 %	70.54 %
Black and white	6.25 %	2.05 %
No photos	29.68 %	27.39 %

Table 10. Climate change news with pictures

Human subjects in the picture: Climate change news is accompanied with human subjects in the picture like the photos of the affected people or important personalities.

Human Subjects in the Picture	Yes	No
<i>The Hindu</i>	20.31 %	79.68 %
<i>The Times of India</i>	51.36 %	48.63 %

Table 11. Human subjects in the picture

Use of Graphics/ illustration: Climate change news is also found to be presented with graphical image or illustrations in the news item. They can be classified as follows:

Use of Graphics/Illustrations	Yes	No
<i>The Hindu</i>	0.78 %	99.21 %
<i>The Times of India</i>	6.84 %	93.15 %

Table 12. Total use of graphics/ illustrations

Research/Study/Findings in the News Item: Climate change news is also accompanied with study by different authors published in journals or research findings. Such news items can be classified

as follows:

Research/Study in the News item	Yes	No
<i>The Hindu</i>	17.18 %	82.03 %
<i>The Times of India</i>	12.32 %	87.67 %

Table 13. Total use of research findings/ study in the news item

Issues

Religion: The campaign on climate change also got dash of religious stardust when the representatives of the Hindu, Muslim, Sikh, Christian and Buddhist faiths gathered at Windsor castle to discuss the role of religion in protecting the planet and to press politicians to work harder to ensure that a deal on climate change takes place at Copenhagen. The article “Al Gore turns to God to Help Spread Climate Message.” published in *The Hindu* on 4 November 2009, it is explained that Al Gore, the Nobel peace prize winner gave a religious angle to the issue (climate change). It was reported that Al Gore has said that, ‘to appeal to those who believe there is a moral or religious duty to protect the planet.’

Politics: Politics always finds a place in all the issues. Climate change is no different. India’s climate change stand was also criticized by many. For example, the article published in *The Hindu* on December 6, 2009 explains the debate in detail. It was reported that, ‘the government’s decision to offer a reduction in carbon intensity by 20-25% by 2020 over 2005 levels sparked off a sharp exchange of heated arguments. *The Times of India* on December 8, 2009 reported that the event Climate Change Summit also had its part in international politics.

Health: Climate change and health are often related. A lecture by U.S based professor Kirk R. Smith reported in *The Hindu* on January 21, 2010 it was told that climate change actions should address the health issues. The report published in *The Hindu* on January 8, 2010 explains that the climate change and health are interconnected. It was reported that emerging infectious diseases would be a great cause for concern for healthcare providers and policy makers.

Agriculture: Review of the book, *Global Warming and Agriculture* was published in *The Hindu* highlights the issues concerning climate change and its agricultural impacts. Impact of climate change in agriculture was also related to the regional context. The article titled, “Climate Chamber to Study Impact TN Rice Bowl.” published in *The Times of India* it is reported that, ‘with the cultivation area shrinking because of labour shortage, a further dip in yield could lead to a serious food crunch in Tamil Nadu.’ The article titled, “No Climate Mitigation With Expanding Agriculture Trade.” published in *The Times of India* on 18 December, 2009 written by Devinder Sharma, food and trade policy analyst, it is reported that, ‘trade in rice requires 5,000 liters of water to produce one kg of grain, is like exporting scarce water resources. And yet, the Copenhagen summit simply refuses to even acknowledge the environmental disaster waiting to happen from an increased push to global trade in agriculture’.

Gender issues: Climate change has serious impacts on the vulnerable group like women of coastal communities. The article, “Facing a Changing World.” explains the impact of climate change on women belonging to fishing and farming communities. Seasonal changes also results in decrease in the number of fish which will directly result in poor economic condition of the coastal groups. The article titled, “Message for Copenhagen.” which was published in *The Hindu* explained the intelligence of women in Ladakh. It was reported that the women in this region of Jammu & Kashmir use smokeless chulhas to cook food which will reduce the individual carbon emission.

Resources

In the article “Climate: sceptics must be resisted.” published in *The Hindu*, it was explained with relevant points from the paper by the biologist Janis L. Dickinson published in the *Journal Ecology and Society* was also explained to substantiate the article. However, the source of the above particular article is Guardian Newspapers Limited. Some of the photos also find their sources from agency like Reuters, AP, etc. For example, the photo titled “Mission Copenhagen.” which appeared on December 6 in the newspaper *The Hindu* is presented with the source (agency) as AP. William Patterson, a geological sciences professor at the University of Saskatchewan

in Saskatoon, Canada research findings suggesting that the earth’s climate is highly unstable and can flip between warm and cold very rapidly with the right trigger was reported in the newspaper *The Times of India* on November 17, 2009.

The article in *The Hindu* titled, “Climate: sceptics must be resisted.” it is explained that a paper published in the journal proposes that constant news and discussion about global warming makes it difficult to repress thoughts of death, and that people might respond to the terrifying prospect of climate breakdown in ways that strengthen their character armour but diminish our chances of survival. In this article the author concludes with a suggestion for future study like it is fanciful to suppose that those who are closer to the end of their lives might react more strongly against reminders of death? But such an important issue is presented in a dull manner without any pictures or graphical image.

Types of news: Reporting climate change with expert interviews is an obvious extra effort from the side of the newspaper. Both newspapers, *The Hindu* and *The Times of India* reported on the myth behind the Himalayan glaciers. A draft of Intergovernmental Panel on Climate Change’s (IPCC’s) report, published in 2007 and circulated to governments across the world, says: “Its (Himalayan glaciers’) total area will shrink from the present 500,000 sq. Km to 100,000 sq. Km by the year 2035.” The report is said to have borrowed from a 1996 Russian study by V. M. Kotlyakov and put on the glacier melt deadline predicted by it- the study set the deadline at 2350, while the IPCC made it 2035, perhaps due to a small typographical error. The article titled, “There was an Error but we stand by Report” published in the newspaper *The Times of India* on January 21, 2009 is an interview with IPCC chairman.

Acronyms/ Abbreviations: The article, “India for Emission cut Target with Equitable Burden-Sharing.” There are number of acronyms used like CHOGM summit, APEC conference, UNFCCC, which are left unabbreviated in the report. For example, in the article titled, “EU commits \$3.6bn to climate fund.” published in the *The Times of India* on December 12, 2009, in the headline there is an abbreviation used and it is not expanded even in the lead of the article but it is later done in the second paragraph of the article.

Themes: Newspapers around the world not only reported climate change also the issue did find place in the editorial of 56 newspapers around the world. Climate change is also reported positively in some (exceptional) cases. For example, the article titled “As the Glaciers recede..” which appeared in the magazine section of *The Hindu* on December 6 has explained that glaciers melting in Ladakh region is welcoming climate change since it has resulted in warmer winters and emergence of new vegetables in this region. Statistics about climate change given in an attractive manner like using coloured headlines and good pictures may trigger readership. Such presentations also find place in the newspaper supplements. For example, the article, “Footprints on the Sands of Time.” included some relevant statistics made by Dr. Mike Hulme, Professor of Climate Change, U.K. The headline of the article was blue coloured and it appeared in the supplement – young world.

Vulnerable population: Farmers, coastal communities and women are vulnerable to climate change. The article titled, “Climate Change: Farmers Call for Long-term Measures.” published in *The Hindu* explains that farmers, peasants, labourers and civil society representatives from 12 rain-fed states attended a public meeting regarding climate change.

International relations: India also sent the all party team to Copenhagen. The four major developing countries, India, Brazil, China and South Africa prepared for a 10 page draft ahead of the Copenhagen summit. Climate change summit however has paved the way for better relationship between different countries.

Scientific concepts: It is very important to be aware of the different concepts involved in climate change. For example, in the article titled, “Not-so-cold War.” published in *The Times of India* on December 7, 2009 defined phrases like, ‘climate change’, ‘global warming’, ‘green house effect’, ‘carbon intensity’ and other similar elements related to climate change. Suggestions given to mitigate climate change given in newspapers can initiate a positive response to an environmental conflict. In the article which appeared in *The Hindu* on November 24 explains what is called the carbon footprint. The article published in *The Hindu* on November 4, 2009, “Climate: Sceptics Must be Resisted”. It is reported that the survey

conducted by a research centre suggests that there are increasing number of climate skeptics. It was reported in the article titled, “The Climate Denial Industry Seeks to Dupe the Public” published on December 9, 2009 that handful of climate change deniers with a qualification in climate science, has were compromised by companies seeking to protect their profits from burning coal.

Protests: Copenhagen summit has led to increasing conflicts between the developing countries and the developed world. The same was reported in both the newspapers, *The Hindu* and *The Times of India*. For example, in *The Times of India* in the article titled, “Developing World Fumes at ‘Flawed’ Draft.” published on December 12, 2009 a photo of the protesters with banners and masks representing developed nations was included as part of the news item. The photo with the caption, ‘Protesters at the Copenhagen summit on climate change have grabbed the headlines nearly as much as the world leaders gathered there.’ published in *The Times of India*, along with the article titled, “The Other Summit.” on December 13, 2009 explains that the protesters also gain attention in the world newspapers.

Statistical analysis

- The newspapers, *The Hindu* and *The Times of India* carried highest climate change news during the month of December 2009 (64.84 % and 78.08 % respectively).
- Major portion of climate change news was carried in the national news column. The newspaper *The Hindu* covered 42.18% and the newspaper *The Times of India* covered 55.47% respectively.
- About 1.56% of the news articles in the newspaper *The Hindu* were included as special column or as a full page article and about 44.52% of the news articles in the newspaper *The Times of India* were included as special column or as a full page article.
- It was found that 21.09% of the news articles in *The Hindu* adopted either box or bullet points style and about 28.08% of the news articles in *The Times of India* adopted either box or bullet points style.
- The source of 69.17% of news article in *The Times of India* was a reporter and the majority (53.90%) source in the newspaper *The Hindu*

- was an experts or a foreign source.
- Majority of the articles in *The Hindu* and *The Times of India* used about 75-100% space for text and majority of the news articles in *The Hindu* and *The Times of India* used 0-25% of the total space for pictures.
- Copenhagen and the emission cuts featured as majority content in both the newspapers. About 68.75% of the news articles in *The Hindu* and 69.86% of the news item in *The Times of India* were identified as Copenhagen/ emission cuts.
- About 64.06% and 70.54% of the news items were found with colour pictures and about 6.25% and 2.05% in black and white in the newspaper *The Hindu* and *The Times of India* respectively.
- Both the newspapers use human subjects in the picture along with the news articles. It was found out that about 20.31% of the pictures in the newspaper *The Hindu* and 51.36% in *The Times of India* use human subjects.
- Graphics or illustrations are included in a news items in both the newspapers. 0.78% of the news articles in *The Hindu* and about 6.84% of the news articles in *The Times of India* use graphics or illustrations.
- About 17.18% of the news articles in *The Hindu* and about 12.32% of the news articles in *The Times of India* have included research findings or study.

Interpretation of results

Climate change news were covered to the maximum during the month of December because of the Copenhagen Summit. It was found that climate change news were reported more in the national/ regional news section in the newspapers, *The Hindu* and *The Times of India*. The newspaper *The Times of India* uses more human subjects in the news item than *The Hindu*. Research findings or study by different authors are included more as part of the news item in the newspaper, *The Hindu* than *The Times of India*. The content of most of the stories in *The Hindu* is quoted from foreign sources like *Guardian* newspaper Limited, *New York Times*, etc.

Important section of the newspaper like editorial is also devoted to scientists or specialists related to climate change. For example, the editorial page in *Hindu* on 13 October 2009 was written by Dr. Jayaraman, Chairperson of the Centre for Sci-

ence, Technology and Society, Tata Institute of Social Sciences, Mumbai. *The Times of India* also use the pictures of the source (scientists). For example, in the article titled, "India Virtually Isolated at Copenhagen." published on December 14, 2009 the news article is accompanied with the photo of author (Sunita Narain). The majority origin of the climate change news was found to be the reporter. The newspaper '*The Hindu*' practices the use of black and white pictures of important personalities including the prime ministers of different states, minister for environment, etc.

Important climate change issues like Copenhagen and emission cuts finding a place in supplementary issues is a welcome change as supplements usually have huge readership than other sections of the newspaper. In some reports, the news article is accompanied with cartoons instead of pictures. For example, the article titled, "Rich Nations Have to Cut Emissions." appeared in the newspaper *The Times of India* on December 12, 2009 a cartoon was published along with the news report.

In the article titled "Message for Copenhagen." published in *the Hindu* on November 15, 2009 it is quoted in a different coloured font in the middle of the text as, 'It is the most vulnerable, the poorest, who will be hit the hardest if the earth continues to grow warmer.' Fishermen will be most affected by climate change because of ocean acidification, coral bleaching, etc. But such an issue is given least importance in the article published in *The Times of India* on December 24, 2009 as it appears as a small news item at the side. Climate change also had some positive impacts on earth though it is little. Such issues did find a place in the newspapers. Impacts of climate change in the future elaborated may initiate positive response among the readers.

The vulnerable species and places which are threatened by climate change given in the newspaper was obviously an extra effort from the side of the newspaper. Climate change despite having an adverse effect on human beings, it also results in the disappearance of some rare species of plants and animals. It is reported that the scientists stress it is difficult to predict what the impact would be on individual trees, insects and other animals. The usage of acronym BASIC is found to be common in both the newspapers. It appears that it is expected from the readers to be updated of the previous day report to understand the news of the next day since abbreviated forms were not found the next day. Integrating

climate change with topics like food production and health will enable the audience to take mitigation measures or to adapt to emerging conditions.

Findings and conclusions

The methodology of the study helped in finding the prevailing conditions of climate change news coverage with respect to the newspapers *The Hindu* and *The Times of India*. The following are the implications of the study:

- The total climate change news covered by *The Times of India* was found to be higher when it is compared to the coverage by *The Hindu*.
- Both the newspapers, *The Hindu* and *The Times of India* covered more climate change news during the month of December 2009 because of the Copenhagen Summit.
- Climate change news has found to occur more in the regional and national news section in the newspaper, *The Hindu* and in Times nation section in the newspaper, *The Times of India*.
- Some of the climate change news was also reported box style or important points of the news item in bullets. The same style was found to be adopted in both the newspapers. It was found that such news was covered more in the newspaper, *The Times of India*.
- Climate change news found to have its source as reporter, agency or the experts, foreign newspapers, etc. In the newspaper, *The Times of India* the maximum source of the newspaper articles was found by the reporter and in *The Hindu* it was found by the experts and the foreign newspapers.
- Both the newspapers were found to use more space for text (75-100%) and less space for pictures (0-25%).
- It was found that the majority of climate change content of the newspapers was found to be either regarding Copenhagen or Emission cuts.
- Climate change news was accompanied with pictures either colour or black and white photos or without any pictures. The newspapers *The Hindu* and *The Times of India* use more number of colour pictures than black and white pictures.
- Pictures of important personalities were also present among the news item. The newspaper *The Times of India* uses more human subjects in the picture than the newspaper *The Hindu*.

- Graphics or illustrations were also used little while covering climate change. But such coverage was found to be less in the newspaper *The Hindu* when compared to the newspaper, *The Times of India*.
- Climate change news item was also found accompanied with any article published in the journal or a study pursued by any scientists, etc. Such news was found to occur more in the newspaper *The Hindu* than in *The Times of India*.

Reporting climate change as news and explaining the cause and effects of climate change is different. Newspapers explaining the phenomenon of climate change is important as it may influence the people to take necessary actions to mitigate climate change consequences. Climate change news appears more in the newspapers during the Copenhagen summit but otherwise it is reported less. Acronyms whenever used can be abbreviated because if the reader misses it one day can know it the other day. Media plays an important role in public perception of global issues like climate change. Besides the number of articles, the quality of coverage also plays a crucial role in presenting an environmental problem like climate change.

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An evaluation of public communication of aesthetic surgery

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We live in a society where beauty and sensations are important. Advances in medical technologies have brought on waves of new notions of beauty where commercial interests both in the media and the health industry spurred by fashion, advertising and celebrity promotion have tended to popularize body modifications and enhancements. In recent times, through offerings on cable television channels and glossy consumer magazines, medical procedures hitherto only in the precincts of medical schools, gynecological clinics and medical journals have now pervaded the population. More seriously, on the internet particularly, medical experts now offer services and graphic details of such surgeries. Here, we examine the public communication of the phenomenon of aesthetic genital surgery and interrogate thus; is it decent, honest, balanced and ethical? Relying on textual analysis, personal observation and literature review for data gathering, we observe that besides tending to commercialize and medicalise the female organs, a coalescence of medical, advertising and fashion interests as played out in the media sensationalizes the benign science of plastic surgery and robs it of its truthfulness, genuineness, and purposefulness. The conclusion is that in Africa, where the effect of the development crises is telling, the hype surrounding cosmetic or aesthetic genital surgery is a damaging distraction particularly when the continent is waging a battle against female mutilation. The recommendations are that media and medical regulatory bodies should impress upon media and medical industry operators that glaring commercial promotions of cosmetic surgery in public media be checked, and that such communication should bear equal weight of facts related to risks, shortcomings, complications, and threats; in physical, social, and psychological terms.

Keywords: Aesthetic, cosmetic and plastic surgery, Media sensationalism, Cyberspace communication.

Introduction

Generally speaking, the term sensationalism is used to depict all aspects of media messages that are capable of attracting attention, exciting or inflaming emotions. It is related to terms such as commercialization and tabloidization (McQuail, 2005). Aesthetic genital surgery refers to surgical (plastic) procedures performed on the female for cosmetic reasons, i.e. to improve appearance. From the time immemorial, humans have always been concerned about their physical appearance. Batta (2011) writing on feminine aesthetics notes that women as well as men through the ages have modified, altered, adorned or enhanced their appearance by paying special attention to hair, face, lips, ear, nose, eyes, neck, arms, abdomen, nails, skin, calf and intimate parts. These were and are still done as seen in arts, through the clarification, intensification, and interpretation, i.e. manipulation of shape, texture, smell, and somatic speech or body language.

In recent years, the modification, adornment, alteration and enhancement of intimate parts through plastic surgery especially for cosmetic or aesthetic as opposed to medical reasons have been on the increase. The globalization of mass communication, international trade, tourism, satellite broadcasting, mobile telephony not only continues to shrink the world but tends to create, foster, and spread a synchronous culture. To this effect, x-rated (pornographic) magazines depicting images of the females published in Euro-America become available to all parts of the world, though such publications are illegal in some countries. Similarly, satellite broadcast programmes illustrating such surgery using laser technology in sophisticated plastic surgery clinics are viewed in homes even in remote parts of Africa. Also, thousands of websites and millions of web pages offered by the internet and the web containing graphic images of “before and after” photographs of cosmetic surgeries, the surgeons who perform them, the cost of the surgeries, etc., are available for browsing by anyone in any corner of the world with access to a laptop, a personal computer, a cyber-café or a hand-held i-pad, palmtop or mobile phone.

The major concern over the issue is because the ideas, facts, data, and pictures concerning aesthetic female surgery are available in abundance in the public domain. Significantly, the narratives, dis-

courses, and controversies surrounding the subject matter - against cultural and or religious practices - are common amongst Africans, Middle Eastern and some Asian countries. Indeed, in scholarly writing, popular literature, and electronic broadcasting, the general theme in practice represents violence to female, damage to their health, and acts against human rights of women. In fact, recently, the BBC World Service Radio as well as the Aljazeera satellite television have drawn attention to another related but dangerous practice among women in the Cameroons and the Congo - breast ironing. This involves massaging to flatten the breast with hot metal or wooden pestle in order to make the mammary organs less sensitive to touch and less attractive to men.

In this study, the authors' preoccupation is to highlight the trend towards sensationalizing or commercializing through medicine, the female aesthetic surgeries. The study examines public communication of aesthetic female surgery particularly in the internet. The study poses the following questions and finds answers:

- i) What is the nature and quality of aesthetic female surgery in the cyberspace?
- ii) How honest or truthful is public communication of aesthetic female genital surgery?
- iii) What is the motive of communicating it in the cyberspace?
- iv) How safe, fair, balanced and ethical is the communication of aesthetic surgery in the cyberspace?
- v) How suggestions or recommendations can improve communication of aesthetic surgery in the cyberspace?

Rationale

Several reasons account for the choice of the internet as the focus of this discourse. As noted earlier, aesthetic surgery narratives occur in various media of communication – books, journals, magazines, newspapers, radio, television, cable and satellite broadcasting. We choose to preoccupy ourselves with its occurrence in the new medium – the internet or the web for the following reasons: The Internet according to McQuail (2005, p. 138) citing Poster (1999) integrates radio, film, and television and distributes them by means of “push” technology thus:

It transgresses the limits of the print and broadcasting models by (1) enabling many-to-many conversations; (2) enabling the simultaneous reception, alteration, and redistribution of cultural objects; (3) dislocating communicative action from the posts of the nation, from the territorialized spatial relations of modernity; (4) inserting the modern/ late modern subject into a machine apparatus that is networked.

Other new and key medium attributes according to McQuail that make the internet an attractive medium for study include: digitization of all aspects, convergence of different media, internet divergence from mass communication, adaptation of publication roles, greater “interiority” of the audience role, fragmentation and blurring of the “media institution” and reduced social control. Others are: interactivity, sociability, media richness, autonomy, playfulness, privacy, and personalization.

Theoretical framework

To the extent that the communication of aesthetic female surgery in the cyberspace bears marks of persuasion, i.e. presenting information with a view to educating the audience on the facts and figures of cosmetic genital surgery and convincing people of its viability, such communication can be said to approximate advertising. After all, the perquisites of advertising are present, namely: product, place, promotion, and price. Baran and Davis (1995) citing Shally (1987), and Hay (1989) view advertising as the ultimate cultural commodity. They add that,

advertising packages promotional messages so that they will be attended to and acted upon by people who often have little interest in and no real need for most of the advertised products or services. Consumption of specific products is routinely portrayed as the best way to construct a worthwhile identity... or solve problems (often ones you never knew you had (p.333).

Scholars have criticized the tendency of depicting a fixed (normal) image of female aesthetic and to drive the need to alter, modify, or enhance the females’ look through surgery to fit with this image. Two theories can be said to be at work concerning

the public communication of aesthetic female surgery: (a) value-expectancy theory and, (b) elaboration likelihood theory. Infante, Rancer, and Womack (1997) explain that value-expectancy theory as an approach to persuasion is based on the idea that the value we expect from something controls our attitude. What this means is that, if we value youthful looks, comfort, and increased satisfaction as the consequences of aesthetic surgery, then we are likely to have a positive attitude to both the communicated message and the procedure. This is said to work at two levels: Affective – cognitive consistency operates thus: we have affect (attitude, feelings) and cognitions (beliefs, knowledge) regarding a topic and we try to make the two consistent. In other words, if we believe that good consequences will result from aesthetic surgery, we’ll favour (accept) it. The second level is learning theory where we learn to associate consequences with proposals. If a woman conditions herself to the knowledge of the options available for various shapes, sizes, and colour and that every option is normal for her then she would not be persuaded to “improve” appearance with cosmetic surgery. On the other hand, if a woman learns the knowledge associated to pregnancy, childbirth, and old age, she may likely find aesthetic surgery communication acceptable and aesthetic surgery a solution to the “problem.”

The elaboration likelihood theory first explained by social psychologists Petty and Cacioppo (1986) recognizes that persuasion can result mainly from the attributes of the persuasion message or from the nature of the persuasion situation. Infante, Rancer, and Womack (1997, p. 171) note that, “when a persuasion message attempts to influence an attitude which the receiver realizes is significant to his or her life, the likelihood increases that the receiver will cognitively elaborate on the content of the message”. What can be inferred from this is that, the more someone is personally involved in the subject of aesthetic female surgery, the more likely he or she will elaborate on the message on aesthetic surgery.

Methodology

This discourse is hinged on ideas, facts, and data gleaned from the textual examination of aesthetic surgery websites and a review of scholarly literature in books, academic journals, and internet sources. The purpose of the analysis is to determine the inten-

tion, language, quality, honesty, and ethics of communicating aesthetic surgery information through the internet. Printouts from the top 20 websites obtained between January - March 2012 formed the basis for the discourse.

Between the lines

Writing on “Bodies of flesh, bodies of knowledge,” Maureen Whitcomb (2010) demonstrates that existing representations stress the differences and ignore the potential similarities that exist between female mutilation and female cosmetic surgery. Based on World Health Organization (WHO) (2008) definition of female mutilation as, all the procedures involving partial or total removal of the external female organs or other injury to female organs for non-medical reasons. The prevalence of these in the United States and the United Kingdom has risen to 30%, according to Whitcomb. She adds that for labiaplasty, the most popular procedure has an age range from adolescence, as young as ten-years old through to women in their 50s and 60s. Women in their 20s and 30s however are most predominant. She states further that there is insufficient documentation of both the safety and effectiveness of these procedures. Potential complications are said to include infection, altered sensation, and adhesion.

In attempting to trace the origins of female genital cutting, Whitcomb writes that the practice dates back to antiquity and was viewed as a sign of distinction, or a mark of enslavement or subjugation. It is also said to have resulted from the primitive man’s desire to gain mastery over the subject. Some believe that the practice has religious roots while others see it as playing a part in the patriarchal family system by ensuring and preserving male lineage. In framing female surgeries as a functioning social and cultural convention, in some cultures, shame for the family may result from a woman’s refusal for the same. In other societies, it becomes a means of connecting women with men through marriage as well as a means of protection from both aggressive men and from a woman’s own risk. Besides, in some cultures it is seen as a beautification technique that enhances feminine aesthetics.

Looking at female cosmetic surgery as a functioning social convention, Whitcomb states that it is performed for aesthetic, functional and psychological reasons. Female cosmetic surgeons tend to justify aesthetic surgery by describing females of some

somatic abnormality. For these reasons women’s feelings towards them are said to sometime cause” “embarrassment, loss of self esteem, lack of confidence, and self-consciousness”. Finally, Whitcomb believes that female cosmetic surgery derives from social and cultural pressures to conform to ideals of beauty and femininity.

The reasons for the recent mainstreaming of female cosmetic surgery include: marketing as seen in surgical reality shows, internet which offers a very narrow aesthetic of female, appearance in public discourse through more clinical reports and media coverage in women’s magazines, and increasing use of skimpy dress materials, waxing, laser hair removal, fashion advertising and doctors who publicize techniques for beautification. These sorts of concerns according to Whitcomb prompted the New View Campaign to:

actively protest against it because the practice is fairly unregulated and unmonitored ... they exemplify the medicalisation of women and the ways in which it creates new risks, negative norms, and insecurities. The campaign... emphasizes the diversity of normal female and scrutinizes it for the pathologicalisation of females. This campaign, unlike what is presented by female cosmetic surgeons does not represent it as an empowering, liberating practice that provides women with knowledge, choice, and alternatives. Instead, it depicts the practice as one that provides women with false information about the normality of diverse health (p.13).

Writing on “the politics of genital modifications,” Johnsdotter and Essén (2010) state that, “genital modifications take place in a sphere where biology, medicine and cultures are intertwined” (p.29). They add that, “it has been discussed by westerners for centuries, often as a bizarre and cruel practice far away in Africa,” but that, “there is a growing occurrence of procedures wherein western women are having their genitals altered through surgery.” The authors lament that little research has been carried out to map the prevalence and consequences of these procedures whereas there is a growing demand in the United States and British population. The rise of cosmetic surgery is said to show similarities to other trends where market forces and culturally

based views intertwine. In medical circles, it is observed that cosmetic surgery is often done without therapeutic necessity. Johnsdotter and Essén note that women who choose to modify, in several ways may be seen as victims of patriarchy, beauty industry, and the pressuring ideals of today or their inner insecurities. For the reason seen above, they suggest that, “scrutiny of the laws prohibiting female genital surgeries in various western countries makes it obvious that it is difficult to ban it while condoning cosmetic surgery” (p. 32).

Delving into self-regulated cosmetic surgery in the United Kingdom: a poor prognosis for autonomy, Latham (2010) observes that cosmetic surgery is increasingly popular in the UK – moving up from 10,738 surgeries in 2003 to 34,453 in 2007. These operations are done in private clinics in response to patients’ request for aesthetic enhancement of their bodies and not for medical reasons. Latham notes that, “female patients still outnumber male patients by a ratio of 9 to 1 and that women are, “oppressed by the growing culture of cosmetic surgery than men” and that because these procedures involve invasive surgery, “patients run the risks of blood loss, bruising, infection, deep vein thrombosis, wound healing problems, scarring, even death” (p. 48).

Private sector advertising and marketing, Latham (2010) writes, may also increase false expectations amongst patients. Also, patients are unlikely to have been referred by their general practitioners, self referred people may not disclose important contraindications, are not on waiting lists, and this leaves no time to reflect on the treatment or even reconsider it. These may lead to disfigurement and injury. It is important that patients seek adequate information on cosmetic surgery because there is a risk that the patient might fail to achieve her physical aspirations. She may also have psychological needs that are not investigated by the surgeons and thus place her mental health at risk if she becomes dissatisfied or requires more corrective treatment. For these reasons, it is necessary for patients electing to go for cosmetic surgery to note that their care could be less than adequate, there could be lack of written guidance on clinic procedure, misleading advertisements about the potential success of treatment, lack of information about practitioners’ qualification and inadequate medical record and clinical governance (Latham 2010).

Concerning activism on the medicalisation of cosmetic surgery, Tiefer (2010) x-rays the ac-

tivities of the New View Campaign in the United States, which is a grass root initiative challenges the over-medicalisation of it and offers alternative clinical formulations to deal with the issue. According to Tiefer (2010, p. 57), the Nchic has equally looked into how contemporary cosmetic surgery has a special market. To Tiefer, “it obviously offers great financial opportunities, but poor education about it and less moral contests involved in public communication have created an ignorant and vulnerable public”.

Writing on “Norms and bodies; findings from field research on cosmetic surgery in Rio de Janeiro, Brazil, Dorneles de Andrade (2010) observes that cosmetic surgery among others are forms of body modification that have parallels with the discourse on female mutilation and should be considered to have an analogous function of social and gendered objects. The author comments that, “while some authors see it as a manifestation of the abuse of women in a male-dominated system of ideals and norms of beauty, they criticize the rejection by those who at the same time accept cosmetic surgery in western countries. Others do not disagree that it can have negative consequences for women’s health but argue that social customs should not be treated as pathologies because the people whose customs are under attack will not share such an analysis” (p.75). She sees the decision of the individual to use cosmetic surgery as an expression of agency or autonomy and self-determination regarding a person’s own body. Dornele’s de Andrade reports that Brazil has the highest number of cases of cosmetic surgery per capita in the world, 63% of Brazilian women were reported to have said they would like to have cosmetic surgery (the largest of any national group), that the profile of the “natural” vs. the “perfect” represents the role-model and comes from depictions of female that the construction of “normality” vs. “deviance” or “normal”, vs. “abnormal” regarding female and their surgical alteration is culturally shaped in the discourses of aesthetic medicine and the media. In Brazil, Dorneles de Andrade reports that three different types of female cosmetic surgery were being conducted, on the reason for this practice, de Andrade (2010, p.78) states:

psychological problems such as an “inferiority complex” gave cosmetic surgery a therapeutic rationale. The idea of striving for happiness by recreating oneself, which

emerged in 19th century philosophy of enlightenment (still) represents the justification for cosmetic surgery.

She lamented her inability to find published scientific research conducted in Brazil on female surgery but found a large number of advertisements in magazines and newspapers claiming the advantages of “intimate” surgery and comments thus:

the cult of body has become a mass phenomenon and taken on an important social dimension in an information society where norms and images are broadcast worldwide by the media. Self-realization of the individual through body-modification... proceeds, and for a growing number of people, the body is becoming the locus of self-expression and self-determination (p. 81).

The author notes that there is a great need for further studies of the consequences of cosmetic surgery for physical and mental health and that the belief that both female mutilation and female cosmetic surgery are harmful practices for women’s psychological and physical health is a step towards a process of rethinking and re-conceptualizing individual, societal, and cultural ideals and norms. Echoing the view of cosmetic surgery as deeply reductive as it speaks directly to the fantasy of reinventing the self, Andrades is saddened by what is happening to medical ethics in relation to cosmetic surgery because with the growth in a consumer culture, ethics in medicine is becoming more bendable and subject to the law of the market. This view tallies with that Plowman (2010, p. 113) who echoes the argument that, “much of the success of female cosmetic surgery is because its promoters created the problem – that the privacy of this part of the body can foster anxiety, playing on the long standing cultural taboo – which was then sold to women alongside the solution of surgery”. It also means that the creation of a market for female cosmetic surgery, Plowman agrees, is for providers’ financial gain rather than a solution to a pre-existing unresolved problem. This is very suggestive of why Berer (2010) calls for the regulation of cosmetic surgery:

...cosmetic surgery is not well regulated and much has been left to self-regulation. Cosmetic surgery requires... oversight and

regulation. Thorough investigation is needed of many aspects and other types of modification surgery; including who is carrying it out and where, the quality of care in these facilities and level of fees charged, how and where the practitioners are being educated and trained, what if any benefits the procedures have for physical or mental health and for quality of life and relationships and whether the procedures are being promoted in an unethical manner by playing on women’s poor self-image and lack of confidence about their looks, and fears of not being able to find a partner... The views of (young) men and the role they play in their partners seeking cosmetic surgery, as well as the role of the media, are equally important to investigate. On the basis of this evidence, policy and regulation should be developed.

Characteristics of aesthetic surgery communication

The internet contains a plethora of information on cosmetic surgery. For example, Google search for “top cosmetic surgery sites” we conducted on the 4th of October, 2011 yield 8,870,000 results. However, for the purpose of this study, only 11 such sites were purposively selected. Additionally, several aesthetic female surgery websites bear testimonials from satisfied clients. Hardly do we find testimonies of unsatisfied ones, may be because it impacts the marketability of these clinics. In summary then, from the examination of the communication of aesthetic female surgery on the internet, the following can be said to characterize the public communication:

- 1) With regard to decency, it can be said that the public communication of aesthetic surgery on the internet is characterized by graphic details to the extent that a few websites warn visitors that the images could offend their sensibilities. Most websites offer no such caution.
- 2) In terms of ethics, most of the websites bear characteristics that tend towards unethical practices. There is evidence of soliciting for clients, offering of loans and freebies, giving incomplete information, fueling insecurities about normal aesthetics, and advertising of physicians’ credentials, skills, and services. Moreover, the service is largely unregulated or self-regulated.

- 3) Concerning the quality of information, accuracy is sacrificed. The impression the websites give is that aesthetic surgery is desirable even if there are no medical indications. Again, one set the impression from the websites, that there is an analogous relationship between the much despised female mutilation common in third world countries and female cosmetic surgery common in the developed world.
- 4) A focus on honesty indicates that it may not be the welfare of the women folk that drives the female aesthetic surgery industry but financial fortunes for plastic surgeons, the fashion and modeling industry, the pornographic magazine and film sectors as well as the new age view of the pseudo feminine aesthetic.
- 5) In examining balance, it is apparent that there is a lot of lopsidedness in the communication of aesthetic female surgery. The testimonials are more often than not positive – praising the virtues and benefits of genital surgery to the woman, applauding the skills and services of genital surgery experts and down playing on the risks, complications, and potential harm that aesthetic surgery may cause.
- 6) Furthermore, the public communication of aesthetic female surgery is characterized by sensationalism. A lot of hype surrounds the issue not only on the internet but in the press, the broadcast media, and the cable and satellite systems as well as in public conversation. The media tend to offer cosmetic female surgery as entertainment.
- 7) In relation to **cost**, the communication of aesthetic surgery on the internet loudly indicates that though the procedures are touted as simple, requiring local anesthesia, and an outpatient treatment, the cost seems too high, prohibitive and tends towards financial exploitation. The websites show that aesthetic female surgery ranges from US \$ 1850 to 10500. That might be seen as a waste on a needless surgery.
- 8) On the positive side, considering language, it could be said that the communication of aesthetic female surgery is characterized by simple-to-understand diction though some difficult terms are used. Generally speaking, a person of average education can read and understand the language.
- 9) Similarly, in terms of website/ webpage aesthetic, it can be said that the postings use good aes-

thetic. The colours are inviting, the photographs (apart from those that show graphic anatomical details) are attractive and beautiful and the typography is appropriate. However, some of the websites carry too much information as to make the pages cluttered.

Discussion

The observations that we have made above following the textual examination of the communication of aesthetic female surgery have been corroborated by several other scholars. Writing on the medicalisation of women in the era of globalization, Arroba (2003) states that, “one third of women’s lives are marked by aging, one-third of our bodies are fatty tissues, and both... have been transformed into surgically – correctable problems.” She concludes that, “behind it all is profit – it’s all about money in the end. The cosmetic surgery industry is a billion dollar industry. In order to guarantee their income, plastic surgeons distort women’s self-perception and magnify their self-hatred and rejection. We see it every day in the media, the magazines, medical brochures, television, the movie industry, the newspaper, and advertising” (p. 2).

In the same vein, Blanchard (2010) reviewing Marge Berer’s article notes that, surgery has penetrated the beauty industry and has become a high earner with a powerful and growing influence. She laments that whereas there are laws in Europe and Africa against female mutilation surgery, none exist against female cosmetic surgery. She adds her voice to the fact that few women really understand the risks, complications and outcomes of these surgeries and that cosmetic surgery deserves a close look, better regulation and that the whole notion is profit driven and manufactured.

Still on ethics, Bates (2010, p.1) states that cosmetic surgery has been at the centre of escalating controversy critics against proponents in a battle of words over ethics, evidence-based medicine, and philosophical questions of free choice and societal pressure and concludes that, “doing such procedures and advertising them with photographs of purportedly “attractive” versus “unattractive” constitute a violation of the ethical relationship gynecologists have with their patients... To Bates, women should be educated about the wide range of normal anatomy and it is not right for gynecologists to exploit patients’ psychological vulnerabilities merely by

offering aesthetic procedures since the decision implies an endorsement of aesthetic deficiencies among normal women.

Conclusions and recommendations

There is no better way to end this discourse than doing so in the words of Goodman (2009, p. 154):

Genital plastic surgery for women has come under scrutiny and been the topic of discussion in the news media, online, and in medical editorials. In the absence of measurable standards of care, lack of evidence-based outcome norms and little standardization either in nomenclature or training requirements, concern has been raised in both ethicists and specialty organizations. Some women request alteration for reasons of cosmetics, increasing self-esteem. Patients must be assured their surgeon is properly trained and should understand that few validated long term safety or outcome data are presently available in this relatively new field, women also should be made aware that, although they may wish to cosmetically or physically alter, this does not mean that they are developmentally or structurally "abnormal". It is important that training guidelines for practitioners be established and that long term outcome, psychological and safety data be published. The plastic surgeon must have sufficient training in such medicine to withhold these procedures from women with mental impairment, or body dysmorphic disorder.

In addition, the code of medical ethics by the American Medical Association issued in June 2003 provides a befitting guide or recommendation with information that is helpful to mass communicators, online website and page hosts, health aestheticians, and the consuming public. For, in the words of Goodman (2009, p.159) patients and others need to know and take note of the ethical principles of autonomy (acting completely autonomously, free from outside influence, and devoid of mental impairment, depression, anxiety...), non malfeasance (any procedure that has a greater chance of causing harm than good is unethical), beneficence (ethical obligation of the physician to promote the health and welfare of the

patient), justice (the resources of society are used to the greater good of society), and veracity (truth telling, is important in surgical counseling and decision making). Therefore the AMA Code (4-5) relating to the Use of Health-Related Online sites is as follows:

- 4) *Physicians who establish or and involved in health-related online sites must minimize conflicts of interest and commercial biases. This can be achieved through safeguards for disclosure and honesty in funding and advertising. It also requires that physicians not place commercial interests ahead of patient health; therefore physicians must not use health-related online sites to promote unnecessary services, refer patients to entities in which they have ownership interests, or sell products outside of established ethical guidelines.*
- 5) *Physicians who establish or are involved in health-related online sites that use patient specific information must provide high level security protections, as well as privacy and confidentiality safeguards.*

In the light of the above and in view of the online sites examined in this study, it is clear that there is glaring non compliance. While it is true that the practice of aesthetic female genital surgery is not rampant in the developing world, it is true that people do take medical tours abroad for cosmetic surgery, and online agencies scout patients for western-based aesthetic surgeons. It is also true that there is a long standing practice of using herb-based products to purportedly do the needful. Whether they are efficacious or not is open to study. It is therefore important that public communicators in print, broadcast, film, and online media have adequate knowledge of these issues so that the public can be better informed and educated. Most importantly, it is desirable that the practice and communication of aesthetic surgery may be studied, investigated, monitored and regulated for encouraging good practices in cosmetic surgery and discouraging the bad communication that female mutilation is good, harmless, and beneficial. Therefore, media regulators must take a more than cursory look at the communication of aesthetic female surgery online to ensure that they conform to journalistic standards of honesty, truth, accuracy, fairness, balance, quality and decency. Similarly, medical regulatory authori-

ties should closely monitor the practice and communication of aesthetic female surgery to encourage it to operate in accordance with medical principles and ethics of autonomy, non-maleficence, beneficence, justice, and veracity. In doing so, the quality, honesty, and beauty in aesthetic surgery communication would become the ideal that we all desire.

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Children's perception about television programmes

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Introduction

The debate that generation of knowledge, scientific or otherwise, is a cultural process, has remained a never ending process. However, most experts would agree with the assertion that communication of science is essentially a cultural enterprise. The efficacy of communication largely depends upon the language, the proverbs, the idioms, the images and the locale in which target audience lives. Emphasising the role of these factors does not mean negation of dialectical relationship between communication and the elements that constitute the culture. After all, communication specially, science communication, is one of the most powerful instruments of change. We communicate science to bring about a change in cognitive worldview of the target populace with a hope that this will lead to a change in material conditions.

It is needless to say that television has entered into our cultural life and is going to stay as one of the most potent medium of communication. History of the television tells us that those first experiments with this technology had quite strong components of science communication. In fact science communication constituted the core of SITE programme. But when the television, christened as Doordarshan, was introduced at national level the focus was quite different. Chitrahaar, films and serials based on fiction occupied the largest chunk of tele-time and news and current affairs composed the other most important constituent. The only programme '*Krishi Darshan*' that communicated science to a certain extent was beamed at agrarian population.

'All-knowing' middle class of the country did

not consider it proper to use this new powerful medium for educating itself in the discipline called science. In the initial phase there was no niche reserved for science communication. Barring few, the programmes produced for educational slot set the highest standards of 'exceedingly incommunicable television programmes'. Later '*Turning Point*' showed that on television, like fiction and news science, when packaged properly, is also a sellable commodity. The programme, though elitist in nature, became very popular among the Indian viewers specially, among those middleclass children who were acquainted with English language. However due to lack of support the programme had to be discontinued.

Mid nineties saw the emergence and proliferation of cable television. Indian and foreign cable flooded the market. But when policy-makers were oblivion to the science communication needs of the nation it was expected that private channels would also not give it a priority. The only example of a science programme produced by the private sector, that one could site during this period, is '*Kasauti*' on TVI, a private channel, which produced a programme for about two years. Among all the programmes, which were telecast by this news and current affairs channel '*Kasauti*', produced in Hindi language, had the highest viewership. Once again it was proved that a programme well produced would catch the imagination of viewer.

Realising the potential of this market *National Geographic* and *Discovery* were launched. Both US based channels soon realised that the pasture was fairly green and there was no Indian channel to compete with them. *Discovery* quite soon real-

ised that communication is a cultural process and as a first step they started dubbing a large number of their programmes in colloquial 'Hinglish' i.e. Hindi mixed with a lot of technical words borrowed from English language. But television draws its efficacy and power from visuals and most programmes telecast on these channels represented an alien culture. Thus, of late, *Discovery* has also started beaming programmes that have been produced in India.

Though, in India, we, during the past 66 years have created enormous structures that deal with science and technology, bigger than those that most developing countries have. Council of Scientific and Industrial Research, Atomic Energy Commission, Indian Space Research Organisation, Indian Council of Agricultural Research with its extensions all over the country are a few that operate outside the university structure. These temples of modern India enclose varied and colossal amount of expertise. A fairly large number of university departments and institutes engage themselves in exciting science and technological work. Yet a good viable dedicated Indian science channel is not in sight. It seems as if we have left the job of communicating science to the masses through television to multinational companies and have reserved expertise in launching channels devoted to religion for the Indians.

The present study

A discussion on conceiving an Indian science channel prompted a few quick studies in Delhi and Mumbai. NISTADS carried out a survey on the perception of children about the educational programmes and if they are given an opportunity to make and telecast programmes what would they choose to do. The study was carried out in two schools of Metropolitan City of Delhi. To record the perceptions, two different sets of schools, one Private School (Springdale's School, Dhaula Kuan) and other, a Government School (Government Secondary School, Block C, Mangolpuri), were chosen.

An open-ended questionnaire, containing 32 questions, was administered among the students of ninth and eleventh standard in two schools. In addition to the questions on students' perception regarding various issues related to electronic media, a few questions were added to record the background of the students such as age, gender, parents' education, parents' occupation, nuclear or combined family and family size, etc. A comparative analysis based on

the two data sets i.e. government or private school students was carried out. It should be mentioned here that in government owned school we could interview students of only 9th standard whereas in Springdale's, we were able to interview students of 9th as well as 11th standard students.

The questionnaire contained questions related to:

- level of interest students have in TV channels,
- comparative interest level in various competing programmes that the children have access to,
- telecast on channels,
- the perception about various formats they used to watch,
- opinion about the formats they would like to adopt if they were to make a programme based on their syllabus.

Data was also collected to list the issues on which children want to make TV programmes. Information was also gathered about the most popular internet websites.

For analysis, three sets of students' population were constituted. The questionnaires were handed over to children during the class and they were instructed to fill in the information in the space provided below every question. The information filled in was coded and fed into the computer to construct a database. The analysis was done using SPSS software.

The following paragraphs give the detailed analysis of the data conducted for the purpose of the present report.

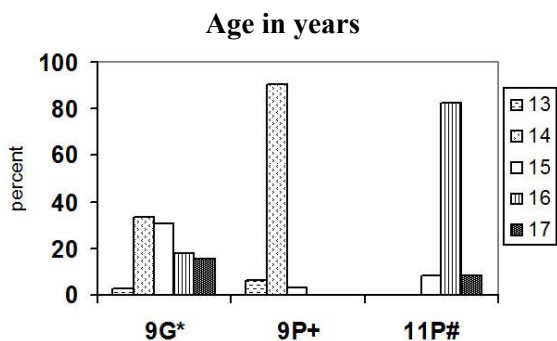
Sample characteristics

The demographic details such as, the type of school, age, gender, parents education, parents occupation, family structure and family size were used for constructing the independent variables termed here as 'sample characteristics'. The factors mentioned above affect the perception of the students and hence formed the control variable that characterised the sample.

Age-wise distribution of the students showed that out of total government school students that were interviewed, 2.6% were 13 years old, 33.3% were 14 years old, 30.8% were 15 years old and 17.9% and 15.4% were 16 and 17 years old respectively. Majority of the ninth standard students were in the age group of 14 years (90.6%). Eleventh

Children's perception about television programmes

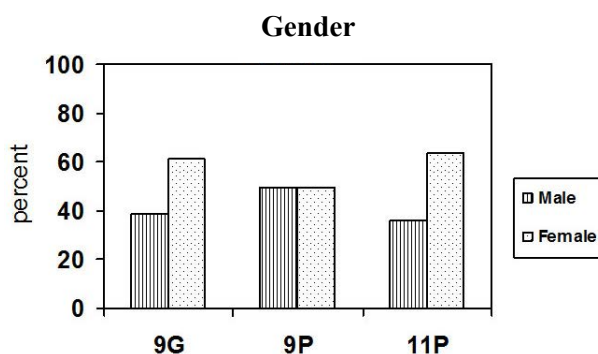
standard private school students being in the higher class, majority were in the age group of 16 years (83%). Rest of them were equally distributed in 15 years and 17 years of age group. The reason for such a vast difference in the age distribution pattern of students in government and private school is two-fold. On the one hand, kids in government schools are allowed to take admission even when they have crossed the minimum age of entry, and on the other since these schools cater to economically weaker sections the failure rate is high at various levels especially at 5th and 8th standard.



9G* Students studying in 9th standard in government school;

9P+ Students studying in 9th standard in private school; and

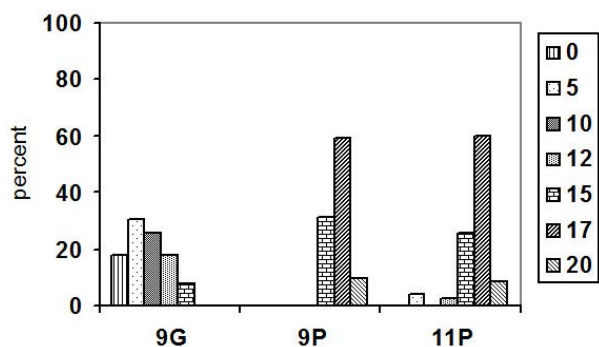
11P# Students of 11th standard in private school.



****9G*** Students studying in 9th standard in government school; **9P+** Students studying in 9th standard in private school; and **11P#** Students of 11th standard in private school.

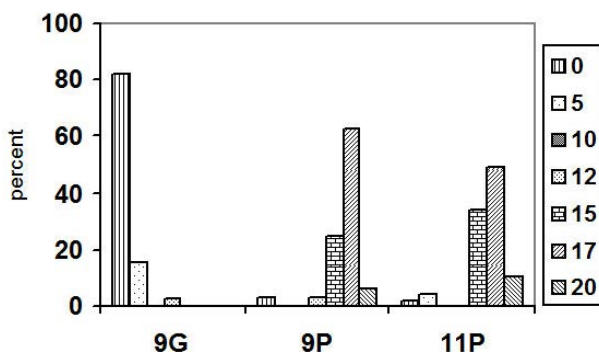
Gender-wise distribution of the sampled population revealed that percentages of girls for **9G** and **11P** samples was higher than the boys, whereas in **9P** group students were equally divided along the gender.

Education of father



There was marked difference between the educational standard of parents of children who were studying in government and private school. The Fathers of government school children were found to be far less educated when compared with the parents of private school children. A very high percentage of latter was post-graduates. The fathers' education in case of **9G** was found to be only 7.7% graduates and 17.9% had received no education. 30.8% were 5th standard pass, 25.6% were 10th standard, and 17.9% were 12th pass. But in case of **9P** and **11P** more than 59% fathers were post-graduate.

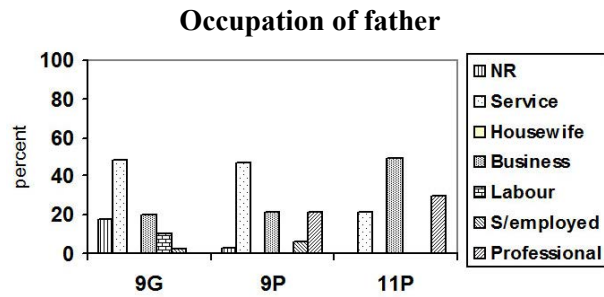
Education of mother



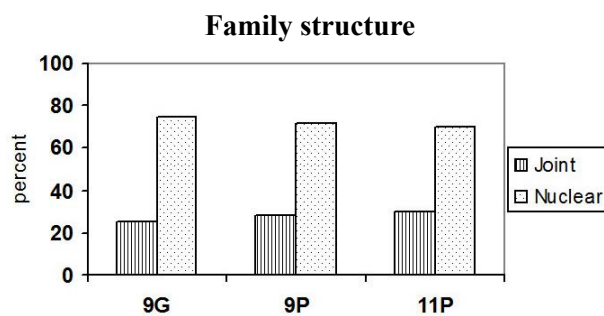
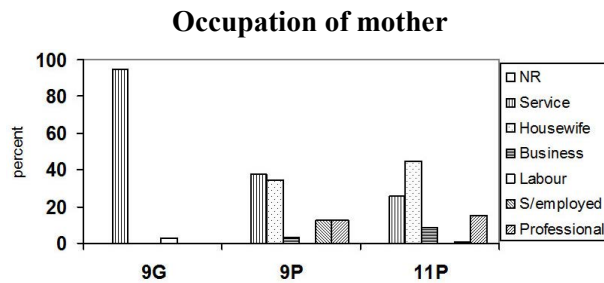
The students were also asked to list the occupation of mothers. 82% of **9G** students reported that their mothers were not educated through any formal schooling and 15.4 per cent had received primary education, rest 2.6% had passed 12 standard. As high as 62.5% of **9P** mothers were post-graduates, 25% were graduates, and 6.3% had received their doctorate degrees. Analysis revealed that in **11P** sample 34% mothers were graduates, 48.9% were post-graduates and 10.6 were Ph.D.s.

Occupation wise distribution showed that fathers of 48.7% of **9G** students, 46.9% of **9P** students and 21.3% of **11P** students were in service. Fathers of 20.5% of **9G** students were in small business or petty trading and 21.9% of **9P** students and 48.9%

of 11P students were in business. The marked difference between the sub-sets of students was that fathers of 10.3 of government school students were labourer and students of this class did not study in the private school. The analysis also revealed that fathers of 21.9% of 9P students and 29.8% of 11P students were professional such as advocates, doctors etc. this section did not send their ward to the government school under the scrutiny.

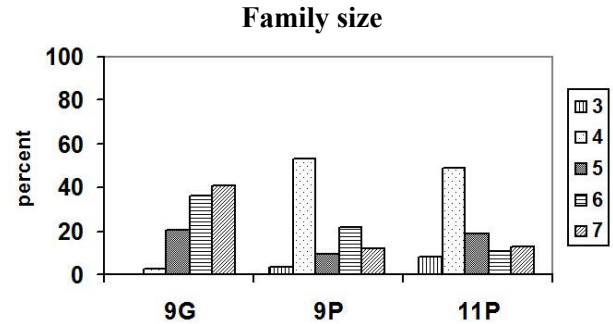


As high as 94.9% of 9G students reported that their mothers were housewives and the remaining 2.6% were working as labour. 37.5% of 9P students ticked service as their mother's occupation, 34.4% were housewives, 3.1% reported business, and 12.5% ticked self-employed and equal number reported doctor, lawyer, architect etc. Similarly, 25.5% of 11P students marked service, 44.7% were housewives, 8.5% reported business, 6.4% were self-employed and 14.9% ticked category 'professionals' as their mothers occupation.



Nuclear family has become the norm in urban set

up. It was clearly evident from the data collected that among all three sets of the students more than 70% of the families were nuclear families and the rest, i.e. less than 30% were reported as joint families of varying size.



The family size for the 41% of 9G students was seven members per family and 35.9% having six members per family. A very small percentage responded 'four members' as their family size (2.6%). However, those who reported five members as their family size (20.5%) significantly high in numbers. Students studying in private school reported a comparatively smaller family size. These were 53.1% for 9P group and 48.9% for 11P students reported four members family. 12.5% of 9P and 12.8% of 11P students stated that they had seven member in their families and most of these students live in a joint family.

The above factors in the opinion of authors have a significant bearing on the environment, the selection of programmes and extent and duration to which the television is accessible to a child. A number of studies have reported that the presence of a television initiates an unending power struggle for gaining supremacy in handling remote control panel or selection of programme to be watched, among the family members specially the battle lines are drawn between the young and the old.

Response analysis

The following paragraphs elaborate the analysis of the responses rendered by the children. The very first question posed to the students was whether they watch television or not. And the obvious response to the question was positive, however just two students out of the total sampled population (118 students) said that they do not have television at home but reported that they do watch TV programmes at friends' or relatives' places.

If you don't understand a particular science problem whom do you consult?

	9G	9P	11P
No response	23.1	----	6.4
Parents	2.6	28.1	10.6
Teachers	43.6	37.5	66.0
Intelligent person	23.1	----	----
Others	7.7	34.4	17.0

In response to the question 'If you don't understand a particular science problem whom do you consult?' a large number of students responded 'Teachers'. For solving problems related to science 43.6% of government school students, 37.5% of 9P group and 66.0% of 11P students said that they consult their school teachers. A very large percentage i.e. 34.4% of 9P students reported that they rely on others sources of information for solving science problems. The sources listed were internet, and coaching centres. It should also be noted that a large percentage of those who study in private school consult their parents which was not the case with the Govt. School children. The educational support system was available to only 2.6% among the latter group.

Could you tell us about any experience that you may have had with problem or question whose answers were difficult to find?

	9G	9P	11P
No response	53.8	56.3	68.1
Biology	7.7	3.1	2.1
Physics	5.1	21.9	10.6
Chemistry	----	12.5	4.3
Mathematics	----	3.1	2.1
Others	33.3	3.1	10.6

When asked to report a problem that was difficult to crack, more than 50% in each group were unable to recollect such an incident. However, for analysis, the reported problems that were categorised according to subjects. The data analysis showed only 12.8% government (9G) school children faced problems in science subjects. In the same category corresponding percentages among the other two groups were fairly high 33.3%). But students of public school are more in percentage facing problems in various fields of science, about 40 per cent of 9P and about 20 % of 11P.

Has it ever happened that you found a particular science topic difficult but after watching a related programme on TV you could understand it better, site example?

	9G	9P	11P
No response	46.2	53.1	44.7
Biology	7.7	21.9	2.1
Physics	2.6	18.8	23.4
Chemistry	5.1	3.1	4.3
S&T	2.6	----	4.3
Environment	25.6	----	4.3
Other	10.3	3.1	17.0

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

All the students were asked to report if ever, watching a television programme, solved a problem they were facing in science. The examples were categorised according to the subjects and the data fed was subjected to statistical analysis. In response to the query 25.6% of 9G students cited examples related environmental sciences and about 18% narrated incidents related to physics, chemistry and biology put together. And about 40% 9P students reported, incidents/problems related to biology and physics, were solved by watching a television programme. Among 11P students 23.4% said that they were facing problems in physics, which could be cracked after watching a TV programme.

Can you think of any programme that you have seen recently, which gives you more understanding than just reading about it?

	9G	9P	11P
No response	25.6	62.5	42.6
AIDS	----	9.4	12.8
Krishi Darshan	28.2	----	2.1
Discovery	15.4	28.1	10.6
Other	30.8	----	31.9

In order to probe the perceived efficacy of TV programmes over reading a question was included in the schedule. The question posed was *Can you think of any programme that you have seen recently, which gives you more understanding than just reading*

about it? In response 28.2% of students from 9G group cited *Krishi Darshan* and 15.4% listed programmes telecast on *Discovery* channel. Analysis further revealed that 9.4% of 9th standard students of private school (9P) reported that they acquired knowledge about AIDS through TV programmes and 28.1% watching *Discovery* helped them better than books. 12.8% in 11 P sub-sample for AIDS related programmes gave them a better understanding of the issue when compared with books.

What kind of programme/s do you watch during the course of the week?

	9G	9P	11P
No response	15.4	6.3	8.5
Comedy	12.8	31.3	----
More than one	59.0	----	80.9
Others	12.8	62.5	10.6

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

The students when asked to furnish information about the categories of programmes that they watch during the course of one week reported that they watch films and serial regularly and often documentaries as well. The analysis of the data showed that majority of children watch more than one type of TV programmes. 59% of 9G group and 80.9% of standard private school students watch more than one type of TV programmes. 12.8% of 9G and 31.3% of 9P group children watch only comedy programmes. And rest of the students watch other programmes such as serial, music, suspense, general knowledge and entertainment related.

What formats do you like?

	9G	9P	11P
1 Film	10.3	18.8	23.4
2 Serial	82.1	15.6	8.5
Both 1 & 2	----	21.9	21.3
Serial & Interview	----	9.4	4.3
Other	7.7	34.4	42.6

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

All the students were asked to choose their favourite formats of the TV programmes from a list provided to them below the question. The analysis revealed that television serial and films are the most favoured formats. However an overwhelming majority (82.1%) of private school ninth standard kids preferred serial over any other format. Analysis further revealed that a fairly large number of children who study in the private school chose other formats such as documentary, docudrama, drama, etc.

Which is your favourite educational programme?

	9G	9P	11P
No response	12.8	15.6	21.3
BQC	----	25.0	14.9
Science Files	----	6.3	6.4
Discovery	7.7	21.9	25.5
Shaktimaan	33.3	----	----
Health Care	20.5	----	2.1
Other	25.6	31.3	29.8

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

The students were also asked to furnish information about their favourite education programmes. The analysis showed those students who reside in a resettlement colony and study in a government school navigate in a 'virtual cosmos' that modestly intersects with the one which fascinates the students who come from affluent families and study in a private school. All put together public school students reported that they watch *Bournvita Quiz Contest*, *Science Files* and *Discovery* for augmenting their general knowledge. Those students who study in the government school identified *Shaktimaan*, *Health Care* and *Discovery* programmes (only 7.7% among 9G watch discovery).

What do you like or dislike about so-called educational programmes?

	9G	9P	11P
No response	33.3	15.6	23.4
Awareness	23.1	46.9	55.3
Boring	----	21.9	12.8
Fitness	20.5	----	----
Science based	15.4	----	----
Others	7.7	15.6	8.5

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

In response to the question as to ‘what do you like or dislike about the educational programmes telecast on television?’ 33.3% of those who study in government school abstained from answering the query. Off all 23.1 per cent from among 9G group thought that these programmes raise their awareness level. A fairly substantial number of students who go to the private school, i.e. 46.9% of 9P and 55.3% students of 11P said that the educational programmes enhance their awareness. Comparatively a significant percentage of ninth and tenth standard students of private school were quite frank and said educational programmes are boring. In the government school sample no one said so. Private school students did not show any interest in health care programme.

If TV programmes were to be based on your syllabus, what topics would you suggest, that is which are the subjects you have difficulty with and need more material on?

	9G	9P	11P
Science	94.9	93.9	40.3
Social Studies	38.5	56.4	31.9
Hindi	----	3.1	21.3
Others	35.9	31.2	36.1

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

The next question in the schedule was ‘If given an opportunity to produce a TV programme on your syllabus what topic would you choose?’ The responses were categorised subject wise. Science scored the highest. 94.9% of 9G and 93.9% of 9P focused on topic related to. Since it was a multiple-choice question analysis showed that 38.5% of 9G and 56.4% of 9P students chose topics related to social sciences. Among 11P students percentage of those who chose science topics was quite low i.e. 40.3%, 31.9% listed topics from social sciences, and 21.3% from languages such as Hindi.

Which programmes help you enhance your general knowledge?

	9G	9P	11P
BQC	----	56.3	36.2
Mastermind	----	6.3	21.3
Sonpari	15.4	18.4	----
News	----	3.1	14.8
Discovery	23.1	21.8	17.1
KBC	----	12.5	8.5
Others	43.6	75.1	17.1

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

In response to the question ‘identify those general knowledge programme/s which enhance your capability to get through a competitive exams, 23.1% of 9G students acknowledged this potential in programmes telecast on Discovery Channel and ironically 15.4% listed ‘Sonpari’ a programme i.e., can only be categorised as children fiction serial. Majority of 9P (56.3%) and 11P students (36.2%) responded that ‘Bournvita Quiz Contest’ and Discovery Channel programmes have benefited them. ‘Mastermind’ and ‘Kaun Banega Crorepati’ were other programmes also scored high.

What are the websites you visit?

	9G	9P	11P
Google	----	81.3	31.9
Hotmail	----	53.1	63.9
Yahoo	----	57.3	53.1

Altavista	----	15.6	6.4
Indiatimes	----	9.3	25.6
Rediff	----	----	29.9
Others	----	90.6	95.7

9G students studying in 9th standard in government school;

9P students studying in 9th standard in private school; and

11P students of 11th standard in private school.

None of the students from government school could name any internet website; they are unfamiliar to this part of the 'virtual world', whereas all the students from public school background could provide names of one or more websites. These sites they search/ visit quite often. Most favourite search engine was 'Google' followed by 'Altavista'. 'Hotmail' closely followed by 'Yahoo' scored very high on percentage scale. 'Rediff' was also found to be quite popular among the relatively older children. The compilation of the data showed that children surf 34 sites. Surprisingly, the two news sites 'Indiatimes' and 'hindustantimes' were quite popular among those children who were interviewed during the survey.

Where do you go for information regarding your courses of higher studies?

	9G	9P	11P
No response	20.5	31.3	17.0
Internet	----	40.6	74.5
Parents	28.2	3.1	4.3
Teacher	30.8	----	2.1
Newspaper	15.4	----	----
Others	5.1	25.0	2.1

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

Analysis revealed that there was a marked difference between the government and public school students lies in access to information regarding the higher studies. As government school (**9G**) students believe that teachers and parents are the best guides for deciding their higher studies, the private school

students (**9P** and **11P**) rely to a greater degree on modern technologies like internet for taking decisions related to higher studies.

How would you make the TV programme interesting?

	9G	9P	11P
No response	53.8	9.4	23.4
Interesting/humour	5.1	28.1	8.5
Simple	----	25.0	4.3
Educative	17.9	----	10.6
Realistic	----	----	17.0
Others	23.1	37.5	36.2

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

'How TV programme can be made interesting?' was the next question posed to the students. **9G** students said that programme should be educative and humours and **9P** students favoured simple and direct format. A high percentage among **11P** students were votaries of realistic or "real life incident" format for making a TV programme interesting for the viewers.

Which is your favourite channel?

	9G	9P	11P
Star World	----	55.4	46.8
Discovery	33.3	59.3	44.6
Star Plus	76.8	12.5	34.0
Zee TV	56.4	18.8	31.9
HBO	----	----	26.4
Channel [V]	----	----	38.3
Aaj Tak	23.1	6.2	4.3

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

All the children were asked to list their favourite channel. In response it was obvious from the data analysis that quite a large number of students prefer to watch *Star World*, *Zee TV*, *Star Plus* and *Dis-*

covery Channels. However, the cultural divide between the two sets of students was quite noticeable. No one from the sampled sub-set of government school ticked Star World as their favourite channel; they also did not watch *HBO* and *Channel V*. *Aaj Tak* scored the lowest among the top seven channels. Except, *Discovery* the channels that the government school students reported as their favourite, all are Hindi language channels. The private school students preferred to watch channels, which telecast programmes in English language. Large percentage of them reported *Discovery* and *Star Plus* as their favourite channels.

Why is the channel your favourite?

	9G	9P	11P
1 Entertaining	2.9	59.4	55.3
2 Informative	10.3	15.6	12.8
Both 1 & 2	----	21.9	2.1
Knowledge	33.3	----	----
Other	35.9	3.1	12.8

9G Students studying in 9th standard in government school;

9P Students studying in 9th standard in private school; and

11P Students of 11th standard in private school.

For majority of the students who were interviewed in private school the television was a source of entertainment. In response to the subsequent question as to why do you prefer the channel that you have reported as favourite more that fifty percent said that the channel they fine the channel most entertaining. The data analysis showed that for a significant number of all those students who study in a government school television is a source of information and knowledge as well. The reason could be attributed to low level of exposure of these students through other channels. For a large number of them television provides a link between their immediate environment and the larger world. Even through the entertainment channels they come to know of things that they are not exposed to.

Conclusion

The conclusions of the study are based on the data collected in Delhi. The sample collected was quite small and the conclusions drawn are only indicative and cannot be generalised. For confirmation or rejection of the following conclusions a large-level all India based study should be undertaken.

There surely is a need to launch a channel dedicated to dissemination of science. Besides, entertainment, the channel should also satisfy the felt need of the augmenting knowledge base students who are likely to constitute a large segment of viewership - what is known as edutainment.

In order to ensure greater efficacy of the channel, if launched, should ensure the participation of its target audience through an effective feedback system.

In India, an overwhelming majority of students study in government schools. Thus, this segment requires special attention. The policymakers, the management of the channel and the producers of programmes should take into account the special requirements of slot allocation during the day, placement of programme round the year and of issues that bother the minds of the young college and school going students.

All the students have reported that ‘the programmes’ that interest them are entertaining. This conversely also means that the didactic programmes that are beamed through TV channels do not satisfy the criteria of being entertaining, what is needed is a mix of these two elements - edutainment. On the basis of this observation the conclusion could be drawn that a shabbily produced programme which does not have an element of excitement will not cut the ice even if it scores high on information content graph.

The question that in what language the programme should be produced is of prime importance. The analysis suggests that if the government school children are the prime focus then the communication has to take place in local or regional language.

It is quite evident from the analysis that the students who study in government schools and private English schools live in two different socio-economic and cultural domains. The fact that they also inhibit two diverge ‘virtual worlds’ represented by the programme and channel selection beamed through electronic channels is also fairly apparent.



Public understanding and public engagement with science, technology and innovation



The inaugural function in progress

A national conference on ‘Public Understanding and Public Engagement with Science, Technology and Innovation’ was held on February 15-16, 2014 at the Homi Bhabha Centre for Science Education, Mumbai. The conference was jointly organised by Punjab State Council of Science & Technology (PSCST), Chandigarh and the National Centre for Science Communicators (NCSC), Mumbai.

Dr. Parul R. Sheth, Science Communicator, and Treasurer with the National Centre of Science Communicators, Mumbai, in her opening remarks mentioned that the aim of the conference was to focus on the various modes of science communication in order to engage the general public with science, technology and innovation.



Dr Suresh Mahajan, former Head, Molecular Biology and Agricultural Division, BARC, Gharda

Professor of Biotechnology, Institute of Science, Mumbai, inaugurated the conference and delivered keynote address and gave an exposition of the impact of innovation in developing countries in the age of globalization. He warned about the pressures of commercialized research results from outside. He cited examples of Bt brinjal, Bt cotton and bovine growth hormone. He exhorted science communicators to focus on innovation and keep a vigil.



Dr. Neelam Gulati Sharma, Director for Popularising science in the Punjab State Council for Science and Technology, Chandigarh presented an overview of multifarious activities in Punjab.

She gave highlights pertaining to the thrust areas of provision of safe potable water, campaigns to eradicate superstitions and expose fake miracles, social intervention against foeticide and creating awareness against substance abuse.

Convergence in divergence is the key to creativity in science and communication



In a session on communicating science through print and electronic media, Mrityunjay Bose, Assistant Editor, *Sakal* Media Group, Mumbai lamented the absence of dedicated science correspondents in media and the editorial disdain for science news.



He remarked that the government is doing better than the private sector, for instance *Science Reporter*. Doordarshan and AIR have been beaming scientific programmes. *Current Science* publishes scientific papers and often PTI or UNI release some interesting stories. He ended his presentation mentioning that the scientific community needs to start speaking the language of the common man.



Mr. Biman Basu, former editor, *Science Reporter*, while speaking on popular science magazines traced the growth trajectory of science magazines and outlined the history of *Science Reporter* and its sustenance. He mentioned that a popular science

magazine is one of the most effective media for dissemination of newest developments in science and technology. They are easily accessible and provide a broad platform for popular treatment of wide-ranging science disciplines not available through scholarly journals. Popular science magazines can present scientific issues in a way not possible through any other print media.



Mr. K.V.S. Seshasai, CEO, *Zee Learn*, Mumbai talked on science communication through television. He said one of the popular images associated with science in India is a scientist in a lab-coat. A technocratic image of science limits the communication about science to the field of discoveries and technological innovations. Despite many attempts of making science a 'way of life', it is often treated as a possession. A dedicated edutainment TV channel for children has a great scope of making science look less like a possession and more like a lifestyle experience. Communication through television is a powerful tool of shaping attitudes and preferences at an early age. He stressed the need to make science fun and to focus on every day science with a caution to not throw away classic textbooks.

Talking about radio programmes, A.S. Dhindsa, lecturer, District Institute of Education and Training (DIET) at Sangrur, Punjab, described the methodology and techniques for the production of science radio serials. Good radio programmes are a mix of inspiration, talent and craftsmanship. Radio drama or play used to be in mainstream but in recent times it is losing its edges with the spread of TV, mobile and Internet. He outlined protocols for radio storytelling with examples. He also explained how to get the listener inside the realm of your programme by creating curiosity about the subject.



Dr. Anil Sharma, Assistant Director, Centre for Communication and International Linkages, PAU, Ludhiana spoke in the second session on communicating science, technology and innovation through multimedia, traditional media, like plays and vernacular songs.

Prof. Rohini Chowgule, Professor and Head of the Department of Medicine at Bombay Hospital, Mumbai, talked about telemedicine. She described the rapid integration of technology into medical practice. She mentioned that 700 million Indians are outside the medical support umbrella and pointed out inadequate allotment to health care sector at 2.5 % of GDP. She stressed on different types of telemedicine and video conferencing, real-time, store and forward technology.



Dr. Balwinder Singh Sooch, Assistant Professor, Department of Biotechnology, Punjabi University, Patiala talked about innovation protection. He mentioned that intellectual property is the property of one's mind or intellect that leads to an innovation. Innovation is the driver for economic development and wealth creation in the 'knowledge based economy'. Further, the progress and prosperity of a na-

tion depends on the level of scientific, industrial and technological development.



Dr. Alok Thakor, Director, Font & Pixel Media Pvt. Ltd. focused on the inherent problems of language in communicating science. He emphasized the need for jargon free natural language and advised scientists to check on reality rather than on textbook sermons. He shared the difficulties of a creative artist collaborating with a scientist to make science comprehensible.



Ms Margie Sastry, former Associate Editor, *Tinkle* and *Amar Chitra Katha*, presently based in Baroda, talked in the session on enhancing science education and media networking. She narrated the colourful history of science communication by her creation of science characters of the popular features - *Anu Club* and *Tinkle* tell you why and the massive impact it created in the minds of children making science attractive and acceptable.

Dr. T.V. Venkateswaran from Vigyan Prasara, New Delhi briefed about EduSat. In his presentation he brought out Tele-education Mission Document, a report published in 2001 by the Gramsat Programme Unit of ISRO's Development and Education Communication Unit (DECU) identified the need for a satellite dedicated to education. He said EduSat was

Convergence in divergence is the key to creativity in science and communication

expected to fulfil several of the needs in education. He presented the objectives of EduSat for capacity building of quality teachers.



Ms. Saraswati Iyer, former Director, Jawahar Bal Bhavan, Mumbai demonstrated low cost high-impact educational aids that would help teachers deliver easy and effective science education with an object to kindle the curiosity of children by engaging them in various novel scientific activities involving innovative object based learning techniques.



Dr. Narottam Sahoo, Adviser of Gujarat Council of Science & Technology (GUJCOST) of Government of Gujarat, talked about the approach and methodology of the Gujarat Science City which is focused on informal community based learning, different from the formal mode of education. The programs are intended to enliven the imagination, foster creativity and develop a spirit of inquiry, especially in young minds. He mentioned about school children visiting Gujarat Science City who discover the wonders of science and technology and get access to the most exciting and contemporary forms of entertainment regardless the social stratum, education or age group and create a culture of learning. He shared the experience of planning, designing and executing a state

of the art Science city and making it economically sustainable.



Dr. Manasi Rajadhyaksha, former Secretary, Marathi Vidnyan Parishad, and Director, Concepts India Ltd., spoke in the last session pertaining to evaluation, impact and strategic monitoring of science communication. She presented the structure and dynamics of a social survey conducted by Marathi Vidnyan Parishad (MVP) to assess base line scientific literacy and post program status to produce evidence based metric for monitoring projects.



Dr. T.V. Venkateswaran said that evaluation of a project is not simple or straight forward as it may appear at the first sight. As a social science activity, it is embedded in many levels of contestations and hence requires conscious choices to be made. He also said that large number of activities aim broadly to generate public interest in science. Most TV shows, radio broadcast, panel discussions and so on are actually one-way information flow largely.

Prof. Chhaya Datar, former Professor of Tata Institute of Social Sciences (TISS), Mumbai expounded the concept of Jalswarajya as a tool for women empowerment. She presented a case study of demand and supply side of a water management

project with conflicts from privileged and under privileged communities.



Dr. Arnab Bhattacharya from Tata Institute of Fundamental Research, Mumbai talked about Chai-and-Why? A unique outreach initiative of TIFR to take science out to the public based on informal, accessible science-café-like platform. The programmes are conducted by professors, postgraduate students

from TIFR.

He said Chai-and-why was started in 2009 to bring TIFR's science into the public domain. It now runs twice a month with a remarkable range of topics such as science of colour during Holi, fireworks during Diwali, science behind topical news such as wireless networks, etc. He remarked that without being in formal science education, the programme excites children into the realm of science.



[Suhas B. Naik-Satam, Dr. Parul R. Sheth, and Dr. A.P. Jayaraman, National Centre for Science Communicators, Vidnyan Bhavan, V.N. Purav Marg, Sion-Chunabhatti, Mumbai 400022] ■

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Mass Spectrometry

technique is like breaking a cup in the dark and then reassembling it in the light, piece by piece to find out that:

Oh! So it was a CUP."

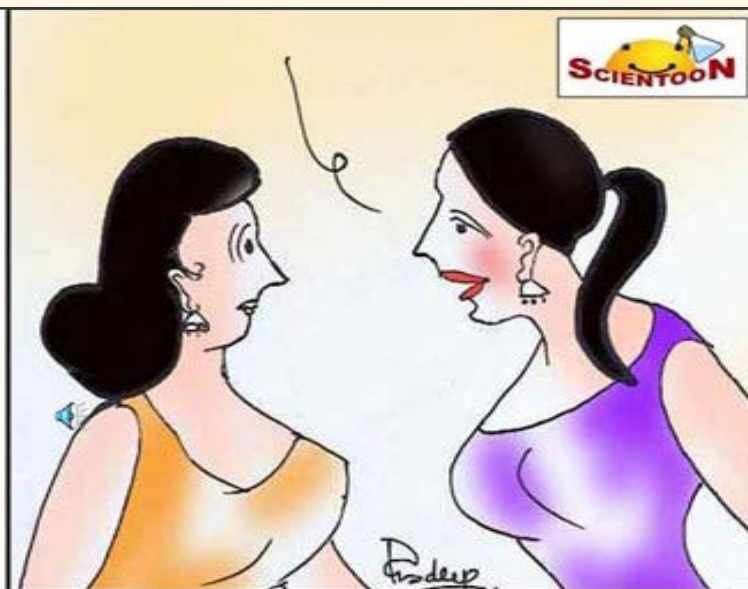


"It's not mass spectrometry but just your face reading, my friend!"



Lycopene is a pigment that gives vegetables and fruits, viz. tomatoes, pink grapefruit and watermelon, their red color. It also appears to have strong antioxidant capabilities. Consumption of foods rich in **lycopene is associated with a lower risk of prostate cancer and cardiovascular disease.**

In a 1995 Harvard University study conducted with 47,894 men, researchers found that eating 10 or more servings a week of tomato products was associated with a reduced risk of prostate cancer by as much as 34 percent.



"You are from science back ground. Can you help me? My fiancée says I have black hairs, charming face, and my lips- he says they are just like **Lycopene**.....what's that?"