UNIT 7 : SCIENCE COMMUNICATION MEDIA

UNIT STRUCTURE

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7.1 LEARNING OBJECTIVES

Following a thorough and comprehensive study of this unit, you shall be able to ---

- effectively understand the significance of various media used for science communication
- know the advantages and disadvantages of different media employed for this purpose
- analyse which particular medium should be or can be used for a specific cause
- comprehend whether a combination of different media may prove to be more suitable for addressing a particular problem
- know how to prepare a suitable Media Plan for launching a science communication campaign
- design messages and communicate various science-related matters

7.2 INTRODUCTION

Selection of the right type of media for spreading various aspects of science and technology is a highly important exercise. This is because many a times an important and potentially-effective message may lose its relevance if it is portrayed in the not so relevant media. Like in many other areas of life, here also media can't be chosen like a one size fits all categories of population. That is why there is an important concept termed 'media planning' that is so significant in this field also. This concept is a detailed and comprehensive plan to utilize various media in a combined manner to publicise something. The goal is to get the maximum benefits garnered from the activity. This plan is based on prior experiences in those fields by persons concerned. So that an almost full-proof plan can be prepared successfully delivering the messages to the right segment of the population or the Target Audience. Further, it is needless to say that without media the whole exercisewould prove meaningless as the messages will not be able to reach humanity. It is worth mentioning here that the society possesses huge repositories or stocks of knowledge in basic and applied sciences and technological areas over the centuries and decades. These are being developed in the different laboratories belonging to independent research and development organizations, universities etc. Some of these basic knowledge sources may not be directly applicable or beneficial to human beings. Yet a vast majority of them can definitely 'uplift' the standard of living of the society if applied properly and they reach the right target audience. But this highly important task of 'delivering' those messages have to be properly carried out by media only. Thus, it is obvious that a judicious selection of a media combine is the only answer to this question. In this unit, we shall discuss in details about various media which can be used for communicating relevant messages at different points of time by the people concerned. The aim is to reach out to the people with some specific ideas for benefitting their lives.

7.3 PRINT MEDIA

Print is the oldest mass media of communication and it is still highly relevant for our specific purpose even today. This media embraces a wide range of individual entities like newspapers, magazines, books, pamphlets, monographs etc. These are used at different points of time by researchers, communicators to reach out to the targeted audience. In our country, according to the Registrar of Newspapers, Delhi, there are more than 1,00,000 registered titles disseminating news as well as other messages to the population on an average every passing day. This is apart from the lakhs of books published by different publishers in a year including textbooks of course.

There is no doubt that it is one of the most important media for communicating science messages to the people in a highly cost-effective and convenient manner as it is a cheap medium. There are advantages and disadvantages of this media. Such as ---

- As it needs to be delivered to the people at their doorsteps, it is time-consuming,
- For the same reason as above, it is difficult to repeatedly deliver the newspapers more than once in a day,

- For remote areas, it may take two to three days for delivering the newspaper to the people
- As it is a written media, many a times it is difficult to demonstrate not so simple ideas to the readers in a simple language
- While photographs speak a thousand words and thereby help a lot in making people understand a concept, yet a certain amount of limitation remains in this regard
- For these factors, readers my also interpret news items in their own ways which is not a desirable development or expectation from such a presentation
- Being a black and white media, many a times there is a problem of a section of the people not being able to access it because of lack of general literacy

7.3.1 Newspapers

A newspaper normally aims at catering to a large audience of lakhs of readers everyday making conscious efforts in trying to present news items on a wide variety of themes and areas. And science and technology (S&T) issues may be just one of them. Nowadays we have many newspapers including dailies or non-dailies which are published in a particular area of life such as sports, business etc., But launching a full newspaper just for science and technology news items may not seem viable at all for various reasons. However, it is a good sign that some of the newspapers, mainly dailies devote at least a full page or half page usually once a week for S&T or health-related issues. The Hindu is a good example which publishes a full page once a week dedicated to this field for the benefit of the readers and people concerned. Many others do give a coverage of science and technology or health-related happenings, events etc, in their papers. But these are usually about the event rather than the actual and relevant messages and facts and figures which should have been covered in reality. However, it is also a reality that coverage of S&T related issues is a very rare happening for a usual newspaper.

7.3.2 Magazines and Journals

Magazines

These are another class of the Print Media which are also highly relevant for our discussion. A magazine may be of monthly or fortnightly duration mostly covering general day-to-day issues of human society. But many of them may also be dedicated to a particular cause or area like fashion, cinema, sports etc. Yet, a few organizations or institutions also do publish magazines devoted wholly to our cause – science and technology issues.

For example, National Geographic is a relevant one and highly-revered in the circles concerned. From India, National Institute of Science Communication and Information Resources (NISCAIR), a CSIR institution under Government of India has been publishing Science Reporter regularly for many years now. This magazine aims at informing the readers about various newer developments in this field in a simple language. It has been reasonably successful in its objectives over the years. Similarly, the Frontline (The Hindu Group of Publications) has been publishing recent S&T developments with

simple language written by experts in each of its issues. Also, the popular Assamese general-purpose fortnightly magazine Prantik regularly carries two full page news items about latest developments in science and technology and one or two interesting anecdotes about famous scientists.

Journals :

These are periodical publications which are fully dedicated to S&T issues either in a general way or in a specific area out of it. A very prominent example is Nature which is a multidisciplinary journal in the field of science and reputed as one of the best in this field. Similarly, in the field of medical and health areas, there are – Lancet, the British Medical Journal etc. Also known as academic journals they operate in a specific way so that only the best and high quality research findings are actually published in them. Such as, a scientist or researcher arrives at a definite result after a long and rigorous process of research study. Then the person or the research team submits an article or research paper with necessary proof to the journal in a format of their own. Following this, there are several levels of high quality review or refereeing of the article. That is, in the first instance, the editor or senior editor of the journal would decide whether it is worth sending for further scrutiny or not. If found worth, it will be sent to established and reputed experts in that particular area of study for their comments and observations. Usually, it is sent to three experts from a panel. If these experts give a positive report then only the article or paper would be finally accepted for publication. This is a major recognition of the research team's efforts and subsequent success. But, here is a twist. That is – when the article shall be sent to the experts for review, it shall be forwarded in a manner in which the experts would not know who is the writer of the paper so that no bias develops in the process. Also, most of the times, some or other serious counter observations come from the experts. It may be like – the findings are wholly rejected as not properly done, there may be major or minor revisions suggested before acceptance. Sometimes, after major review is suggested, the revised article is required to be submitted again for reviewing whether the corrections have been carried out properly or not. Many a times, it is common to see papers or articles being sent back for further revision more than twice also. This system is called 'blind peer review' as the experts really do not know who has written or prepared those articles to minimize any personal bias or favouritism.

A journal is a major way of authentication of research findings in in different fields by various researchers. Only thing is that they are meant for circulation among the scientific or researchers' communities beyond which it may be quite difficult or impossible for general readers to understand the implications. That is why, the challenge is to write for popular magazines where complex findings or developments are expected to be delivered to the people in a language that they do understand in a proper way.

Again, there is this journal Indian Journal of Science Communication published by the Indian Science Communication Society, Lucknow. This is a popular science journal for almost two decades now which is published four times a year. In Assam, Binjan Jeuti is also an example of such a venture which

has been in existence for about five decades now. It is published by Assam Science Society – a pioneer in this field.

7.3.3 Books

A book is another important media for science communication. It is a store house of knowledge in the form of articles, lessons, chapters etc. written by more either one person or more on a particular topic or others. There can be more than two types of such books in circulation. For example, some of them may be published aimed at the scientific and researchers' community only. The others may be meant for understanding by common persons for following the ideas given in them in our day-to-day life. Textbooks for various levels of academic programmes in this field can also be included here. A monograph is one example of this media. Books are really a highly popular media for our purpose as it allows adequate space for discussing various concepts and ideas about science and technology.

LET US KNOW

- Media is a highly dynamic system.
- With the passage of time newer formats and combined forms of various media do evolve which become popular among the audience
- Each medium has its own characteristics which distinguish it from others
- Media is always a neutral system. We have to utilize it according to our goals and objectives
- While an Academic journal is for knowledgeable circles for that particular area of study, magazine and books are usually for the common people to have a basic understanding of a complex issue

CHECK YOUR PROGRESS

Q.1 : Why is media so important in science communication ?

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Q.2 : What are the major characteristics of Print Media ?

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Q.3 : What is a 'blind peer review system' ?

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Q.4 : What is a monograph ?

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7.4 AUDIO-VISUAL MEDIA

Like Print media, we can also sub categorize Audio-Visual media into a few segments. While these two types of media are powerful and effective on their own, yet a combination of both makes it far more impactful with a long lasting effect.

A few characteristics of this media are ---

- Unlike print, here the media need not be physically delivered. If a person possesses the required equipment like a Radio or TV set, one can access the contents either by paying a fees for the programme or mostly free of cost or at a very nominal cost.
- Programmes or contents can be played or broadcast repeatedly at any point of time whenever necessary
- As it can show a visual demonstration accompanied by the anchor or presenters' voice, it is much more effective in making people understand what is being sought to be communicated.
- Contents in the form of programmes or pure demonstration can be shown right from the place of happening like studios, laboratories, open fields where experiments might be carried out
- Contents once produced can be improvised whenever it may be necessary

7.4.1 Radio

Radio is a highly popular media as it has been communicating with the people for a long time as a trusted supportive agent. Its most important advantage is that a person can be engaged in doing something even while listening to its contents. Soon after our country acquired Independence, there were hardly a few thousand newspapers with a low percentage of literacy among the people. And Television was not even in the scene. So the newly-formed governments of the country deemed this media – Radio to be a very significantly-potential medium for this purpose. That is - disseminating meaningful messages to the masses at grassroots level across the length and breadth of the nation. And soon when the Green Revolution was launched which is a major success story. Then, radio – specially All India Radio (AIR) – the only convenient and cheaply available media was taken into confidence for publicising the messages. These media have proved its true worth at that period by carrying out its responsibilities in this regard to the fullest possible extent. That too with more than adequate satisfaction and success. In the process many of the seed varieties or processes of agriculture even came to be known as 'Radio Seeds'. Even later on, programmes on agricultural issues, health and hygiene etc. were the mainstay of this media. This has made it a highly reliable and effective medium for science communication which is still continuing today. It has a very rich legacy of contents in this field. Nowadays, community radio is another very helpful and convenient media for spreading messages of science for the people.

7.4.2 Television

This is one powerful medium for spreading science-related messages to the people of all categories. As it can offer visuals its impact seems to be better than any other media. There are thousands of TV channels all over the world. Among these, quite a few like National Geographic, Planet Earth etc. are dedicated fully to science and technology aspects. Many other general TV channels also feature S&T-related programme. In our country, Doordarshan (DD) has long been broadcasting Krishi Darshan programme for the benefit of the farmers. Besides, in the 1990s, the great scientist philosopher (late) Prof. Yash Pal visualized a serial programme termed Turning Point for DD. This programme had focussed on a particular science issue for each episode and went in-depth about its various aspects to enlighten the people about it. Some of the issues were anchored by popular actor Nasiruddin Shah while Prof. Yash pal also took part in a few of the episodes making it far more effective and impactful. Then, in the 2000s, a very successful programme on Health issues named Kalyani was launched which went on for a long time providing benefits to lakhs of people. This programme, conceived centrally by DD was televised in regional languages of the states with their own programme formats while keeping the basic structure same.

LET US KNOW

- All India Radio covers almost 95 % of the country's geographical areas
- It possesses a rich legacy of various programmes on science and technology-related issues for the benefit of the audience
- It played a major role in dissemination of messages during the Green Revolution
- Krishi Darshan in Doordarshan has been continuing almost since its inception
- Turning point was an interesting and successful educational programme focussing on one specific issue of human life
- Kalyani was a highly popular health-based programme which benefitted lahs of people across the country.

CHECK YOUR PROGRESS

Q.5 : What are the advantages of an audio-visual media for disseminating science-related messages

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Q.6 : What role was played by AIR in Green Revolution ?

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Q.7 : Mention a few specific science-related programme of high popularity and benefit to the people in Doordarshan and AIR.

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7.5 FOLK MEDIA

Folk and traditional media of any society are usually very effective media entities. People identify with these performances and activities and thereby acquire messages from the contents used by the performers. Presently, it is the age of latest developments in mass media and new media. Mass media are also termed as conventional media. But the importance and relevance of folk and traditional media would remain intact forever without any doubt. As they are normally performed in close groups with a 'personal' appeal, they are much more effective in disseminating any intended message to the community. It may be mentioned that there are no specific creators identified with these performances and renderings. But from time-to-time every passing age, communities modify them to suit the real life situation of the current age and thereby keep them relevant for all ages and periods alike. For example, in Bihu and Oja Pali performances of Assam, we can see reflections of the current day happenings in the songs and performances. In Manipur's Sumang Leela and Sumang Kumai, contemporary issues of society are highlighted in an effective manner so that the status of the society is reflected in a proper way.

So, if these performances can be utilized for spreading basic nuances of living a rational standard of life, it would be an ideal development.

Few characteristics of this media ---

- It is inclusive with participation of the audiences or the community
- As they are of the people, by the people and for the people, their importance in any society is always intact despite the aggressive existence of mass media and new media
- Being people-oriented without a rigid structure, performances and functions can be improvised and oriented with localised issues and contents as and when felt necessary
- The performances and the media get enriched by these improvisations which is a perennial process
- At one point of time, there was an apprehension that mass media and new media would cause a major disturbance to them. However, this turned out to be blessing in disguise rather. Because modern media also facilitated the worldwide spread of the folk and traditional media performances
- One disadvantage is that at one pint of time of performance it can communicate effectively to a limited number of people unlike mass media which caters to lakhs of audiences at the same time

7.6 INTERACTIVE MEDIA

Being students of communication, you must already be conversant with particular fact. That is, the communication process needed to be a 'dialogue' with participation of at least two or more sides in it to be more successful. Of course, in case of intrapersonal communication, this does not apply. The media that we have discussed above are not interactive or participatory except folk and traditional media. Hence, the aspect of interactive nature is a major condition for success in the communication activity. It also makes it 'personal' unlike mass media. Nowadays, with advancement in technology, many of the media are going the 'interactive' way in different ways. For example, in internet platform-based-contents or programmes, a person can ask questions, or tap on a term or word to know more about it or get an explanation about it. If not instantly, at least at a sooner time the content provider shall get back to the inquisitive audience with more details about the aspect. The hyperlinks in many of the news items, blogs, articles, explanations etc. are a way of interactive nature of the contents. It is not that mass media was completely 'non-interactive'. For various programmes like songs on request, more specifically agriculture programmes and those like Kalyani (health programme) interactivity was visualized in different forms. In case of Kalyani, a specific theme of health problem was announced much before the programme was to be broadcast and publicity was made about it. On the day of the progrmme, usually two prominent and experienced medical practitioners would be invited who would discuss some basic ideas about it. An anchor in the form of a simple person would carry over the discussions. And phone calls from interested persons would be received instantly for discussion on that person's particular medical problem with the doctors prescribing solutions to the possible extent. Or asking the person concerned to consult a relevant expert in this regard. For Turning Point, peoples' opinions and problems were requested to be forwarded for possible discussion and focusing at an opportune time. Science museums also can be dubbed as interactive media to a big extent as majority of them have provisions for display of science-related machineries and experiments which are 'do-it-yourself' kind of activities and exercises.

Interactivity helps us is several ways. More so for S&T-related matters. Such as –

- It helps us in getting a better idea or review of what is already being disseminated
- Helps us clarifying our doubts, confusions, hesitations
- In case of health-related issues, the identity of the caller or audience need not be revealed
- This also enhances the enthusiasm of the audiences as one enjoys or feels the excitement of participation and identifies oneself with it

7.7 MEDIA ON WHEELS

This is one media that we should know about as it is highly effective, interesting and convenient specially for the young generation audience. Being an unusual one from the regular media as described above, so we should know about it. This unique concept is called Science Express Climate Action Special (SECAS) launched in 2007 by Department of Science and Technology, GoI. This has been an

interesting 'mobile science and technology' exhibition mounted on a full train from Indian Railways. And most of the coaches of it are fitted with various machines, laboratories, posters, book stall etc. There was a group of volunteers who were experts in different fields of S&T dedicated to serving as guides to enthusiastic people. More so for children who would be visiting the train at designated places. There have been a total of seven phases of this endeavour and one of the trains visited Assam and stayed at Rangapara station near Tezpur town apart from a few other places in the state a few years ago. This author had an opportunity to visit this train and was highly impressed by the wide range of subjects and aspects presented in it. Thousands of schoolchildren and also adults visited it and were benefitted by it.

"This unique mobile exhibition was first launched in October 2007 by DST. It has since then made eight tours of the country, travelling about 142,000 km and exhibiting at 455 locations. Over its 1602 exhibition days, Science Express received an overwhelming response from 1.56 crore visitors. It has become the largest, the longest running and the most visited mobile science exhibition. Science Express Phases I to IV showcased cutting-edge research in Science and Technology being carried out worldwide. Phase V to VII were based on the theme of biodiversity and known as 'Science Express Biodiversity Special (SEBS)'. It showcased the rich biodiversity of India and its conservation measures. Phase VIII as was designed as 'Science Express Climate Action Special (SECAS)' which was initiated highlight the global challenge of climate change and effective mitigation measures."
(http://www.wiienvis.nic.in › SECAS_2017_8567)

Also, in addition to the contents on the train, the volunteers organized quizes, innovative ideas contests etc. among the visiting students' groups which made it a unique lifetime learning opportunity for the participants. This kind of innovative media should be encouraged more in future by the authorities concerned in this direction.

LET US SUM UP

- Folk media is more participation-oriented and attached with the immediate community of which it is a part of
- Normally there is no known creators or writers of the folk renderings and performances and people contribute to it in every passing age by adding to the experiences
- It is very dynamic as it keeps up with changing times and the upcoming issues or the society in every age
- Over the years, the arts get improvised with localized contents and performances
- The fear that mass media would spell doom for it has gone away as it is actually facilitated by the latter
- It is considered as a 'personal' medium rather than being n 'impersonal' one like mass media
- Interactive media is more lively as it allows participation from audiences

- Though interactivity is more prominent in internet-based media, even the mass media has this aspect in different ways
- SECAM has been a unique experiment on science communication on wheels concept and a highly successful one

Check your progress : C

1. What is the utility of folk media in science communication ?
2. Can we term folk media as interactive media ? How ?
3. How does folk media enhance its acceptance in society ?
4. Why is interactivity more effective in impacting people ?
5. What is the concept of Science Communication on wheels as demonstrated by SECAM ?

7.8 FEW OBSERVATIONS

Though we have discussed about just a few media here, the scope is not limited only to these ones. Media is a dynamic and flexible entity and it always evolves with new systems or format in every age and time period. It is to be noted that one particular media may not be completely convenient for a specific purpose. Thus, we may have to combine more than one of them for achieving our purpose in a proper manner. Further, every media has its own characteristics. This aspect allows us to know which one would be better for a specific issue and society under any given circumstance. Media planning is an important concept as mentioned at the outset which needs to be mastered properly if science communication has to be successful. Also, proper and adequate identification of the target audience, its profile, designing of messages based on these aspects etc. are equally important to make the programme a success.

7.9 LET US SUM UP

- Folk media is more participation-oriented and attached with the immediate community of which it is a part of
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7.10FURTHER READING

Important documents -

Social media science communication is a nonstop academic retrieved from https://www.nature.com/articles/s41562-021-01138-0

Audio-visual Science Communication on TV and YouTube. How Recipients Understand and Evaluate Science Videos retrieved from https://www.frontiersin.org/articles/10.3389/fcomm.2020.608620/full

The communication of scientific research in news media: Contemporary challenges and opportunities Comment retrieved from https://jcom.sissa.it/archive/19/03/JCOM_1903_2020_C01/JCOM_1903_2020_C06

Science communication media for scientists and the public retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2002562/

Gap between science and media revisited: Scientists as public communicators retrieved from https://www.pnas.org/doi/10.1073/pnas.1212745110

7.11 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1 : Because it is the media which can only help us in reaching out to the targeted audience with our messages. This is because there may very wonderful research findings which may have huge potential for enhancing the standard of living of human beings. But, if these findings can't be acquired by people they would not be able to utilize them and that would be a waste. Here, media can play a decisive role in disseminating those contents to the masses.

Ans to Q No 2 : As Print media has to be delivered physically it is time-consuming and difficult to repeatedly deliver the newspapers more than once in a day. This may lead to delay of more than one day in delivering it in remote areas. Being printed media, it may be difficult to express some concepts in a clear manner leading the readers to interpret in their own ways which is not a desirable prospect. One needs to be literate to go through it.

Ans to Q No 3 : This is a concept used in academic research journals where all submitted articles to the journal are sent for rigorous reviews (evaluation) by subject experts. That is, if the editor of the journal at first finds that it is worth sending for review. It is called blind peer review because it is

communicated to the experts in such a way that they do not the identity of the writers or scientists of that article. If only the experts approve of the article, it is published after revising the same if needed.

Ans to Q No 4 : It is like a book only but written on a particular theme or subject in a highly-specialized way with adequate research studies dedicated for the purpose. It is usually written by a single person or a research group.

Ans to Q No 5 : Audio-visual media can show a live demonstration of any experiment, exercise or activity which makes it much more convenient to understand. Also, the contents can be stored for future viewing whenever needed. Besides, the audio-visual effect makes messages much more impactful compared to other media.

Ans to Q No 6 : In absence of any other prominent media like TV and very low presence of print media, AIR was instrumental in spreading messages of Green Revolution. Even many of the agricultural innovative systems and seeds used to be known as Radio Seeds because of this effort of All India Radio (AIR).

Ans to Q No 7 : A few vey successful and popular science and health-related programmes in Doordarshan are – Krishi Darshan, Turning Point and Kalyani (health programme). The first one is dedicated to agriculture-related issues. The second one dealt with one particular problem of science with experts delivering in-depth analysis and knowledge for benefit of audience. The third one has been a health-based programme in which medical experts would discuss the issue with online consultation with interested persons over telephone calls. AIR also had somewhat similar programmes primarily in agriculture,health and hygiene-related matters.

Ans to Q No 8 : Folk media by virtue of its being interactive and participatory is still relevant for disseminating science-related matters and shall remain so forever. As it allows real time participation, people feel themselves a part of it thereby its messages are more effective and carries a lot of impact.

Ans to Q No 9 : Yes. It is much more interactive than any other media. It is performed among the people or communities. So, any member of the latter can participate inspired by its performances. This aspect enhances the sense of belonginess for the audience and the impact is more than any other media.

Ans to Q No 10 : Being highly inclusive and participatory with simple ways of functioning, it endears itself to the people and thereby raise its acceptance in society. That sense of belongingness is so important in this regard.

Ans to Q No 11 : Because a person accepts a message by wholeheartedly participating in the performances which makes one sensitized towards a particular issue. The same opportunity is almost non existence in case of mass media as this is primarily an 'impersonal' media with much-delayed responsiveness or feedback registering system.

Ans to Q No 12 : It has been a fully-dedicated science-theme-based train that travelled around the country for popularizing science-related concepts particularly for children but also to others interested. Promoted by Department of Science and Technology, Government of India, its seven phases focussed on different areas of science and technology based on real life issues. It has been a highly popular experiment that should be repeated again in future.

7.12 POSSIBLE QUESTIONS

A. Short Questions

1. Discuss the necessity of media for science communication.
2. What is media planning ? Describe various media for science communication along with their advantages and disadvantages.
3. Why is it believed that folk media is more effective and impactful than other media ?
4. What is your understanding of the concept of Interactivity ? How can a media be interactive ?
5. How can mass media and folk media play a complementary role with each other ?
6. Is there any scope for using media in a flexible and participatory manner for science communication ?

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