PGJMC S4 02

Science Communication (Optional)

SEMESTER IV

JOURNALISM AND MASS COMMUNICATION

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

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CONTENTS

Pages

UNIT- 1: INTRODUCTION TO SCIENCE COMMUNICATION (7-18)

Concept of Science Communication, Definition of Science Communication , Importance of Science Communication, Need of Science Communication

UNIT- 2: BEGINNING OF SCIENCE COMMUNICATION IN INDIA (19-27)

Beginning of science communication in India, Contribution of Print Media, Contribution of Radio, Contribution of Television, The science communication movement in India

UNIT- 3: SCIENCE COMMUNICATION IN ASSAM (28-35)

Science Communication in Assam, Pre Orunodoi era, Orunodoi era, Post Orunodoi era, Post independence era, Science Magazines in Assam

UNIT- 4: WRITING AND REPORTING ON SCIENCE (36-55)

Writing Science News, Writing of Feature and Articles on Science

UNIT- 5: PREPARING BROADCAST MATERIAL ON SCIENCE (56-65)

Various formats of Radio Programmes, Various formats of TV Programmes, Writing for Radio and TV on Science

UNIT- 6: HEALTH & ENVIRONMENTAL COMMUNICATION (66-77)

Health Communication, Environmental Communication, Meaning and Definition, Areas of Environmental Communication

UNIT- 7: LAWS, ETHICS & AWARDS FOR SCIENCE COMMUNICATION (78-94)

Media Laws & Ethics, Laws related to Science, Awards for Science Communication

COURSE INTRODUCTION

In this course we are going to discuss the basic concepts on science communication. This is an optional paper of the course. A good and clear concept about science communication is necessary for inculcating scientific temperament among the common people as a journalist or communicator. Once you complete this course, you will have developed a clear idea about the science communication.

The course is divided into seven units, which are as follows –

UNIT- 1: INTRODUCTION TO SCIENCE COMMUNICATION

In this first unit of this course we will concentrate on the concept of Science Communication. The need and significance of science communication will also be discussed here.

UNIT- 2: BEGINNING OF SCIENCE COMMUNICATION IN INDIA

This unit is going to cover such important topics as the beginning of science communication in India and the contribution of print and electronic media in carrying science to the masses. Besides science communication movement in India has been given particular emphasis since efforts to popularise science among the masses have been undertaken at the level of the Government and non- governmental sector.

UNIT- 3: SCIENCE COMMUNICATION IN ASSAM

In this unit we will discuss the beginning of science communication in Assam. Science Communication was not an alien concept in Assam where it has passed through various stages of growth from the pre Orunodoi era to the present time. Right from the translation of a popular book on Mathematics in 1434 by Bakul Kayastha Science Communication has come a long way to claim for itself a respectable place as a medium for popularation of science. This unit will chart the steady growth with particular attention to the popularity of science magazines being written at different points of time.

UNIT- 4: WRITING AND REPORTING ON SCIENCE

After introducing Science Communication in the previous units we are going to discuss in this unit the method of writing in science communication. There are various ways of presenting science communication and a detailed account of the methods of writing science news and reports is given in this

unit. Writing of science news and writing of features and articles have been discussed here to offer a comprehensive description of the essentials about science reporting.

UNIT- 5: PREPARING BROADCAST MATERIAL ON SCIENCE

In this unit we are going to discuss thevarious formats of radio and television programmes. The writing style in broadcast media will be given a special focus in this unit which will also give you an insight into the format of writing for broadcast media. This will help you to know and understand what should be the style of writing for the media with special reference to science.

UNIT- 6: HEALTH & ENVIRONMENTAL COMMUNICATION

In this unit of this course we will concentrate on the concept of Health Communication. The need and significance of health communication will also be described here. By health communication we generally mean the use of communication strategies for enlightening the masses about the issues of health. Therefore health communication is a broad term that embraces various aspects and types of communication channels that address the health concerns in relation to individuals and the public at large. The following sections of the unit deal with the important aspects of health communication with an added emphasis of strengething it as an invaluable tool of heath management.

UNIT- 7: LAWS, ETHICS & AWARDS FOR SCIENCE COMMUNICATION

In this unit we will concentrate on the laws and ethics of Science Communication. The need and role of ethics in science communication will also be given particular attention here. In science communication laws and ethics are of particular significance as the entire concept is a broad one and needs elaboration. The following sections of the unit deal with such vital issues as freedom of speech and expression, media freedom and defamation and above all, the Official Secrets act of 1923 and the Right to Information Act.

UNIT- 1: INTRODUCTION TO SCIENCE COMMUNICATION

UNIT STRUCTURE

1.1 Learning objectives
1.2 Introduction
1.3 Concept of Science Communication
1.4 Definition of Science Communication
1.5 Importance of Science Communication
1.6 Need of Science Communication
1.7 Let us Sum Up
1.8 Further Reading
1.9 Answers to Check Your Progress
1.10 Possible Questions

1.1 LEARNING OBJECTIVES

After going through this unit you will be able to –

- explain the concept of science communication
- discuss the definition of science communication
- elucidate the need and significance of science communication

1.2 INTRODUCTION

We have discussed various issues and aspects of mass communication and journalism in the previous courses of this programme of mass communication. This course is dedicated to an emerging concept- i.e. science communication.

In this first unit of this course we will concentrate on the concept of Science Communication. The need and significance of science communication will also be discussed here.

In the next unit the history of science communication in India will be summarized.

1.3 CONCEPT OF SCIENCE COMMUNICATION

Already you have studied different aspects of mass communication and journalism. Science communication is an emerging concept of mass communication. In a developing society like India, we cannot ignore the importance of science communication. Because, we are still a part of the society where age old social beliefs and superstitions are still alive. So, science communication is not only important for development of a society but also it is the need of the hour.

Before going to discuss at the concept of science communication, we may have a look at the concept of the terms - science and communication.

The word science has been derived from a Latin word *scientia*, meaning "knowledge". In its broadest sense, science is any systematic knowledge that is capable of resulting in a correct prediction or reliable outcome. In this sense, *science* may refer to a highly skilled technique, technology, or practice. Science is a field of study seeking to understand natural phenomena through repeated observations and experiments.

According to Webster's New Collegiate Dictionary, science is "knowledge attained through study or practice," or "knowledge covering general truths of the operation of general laws, esp. as obtained and tested through scientific method and concerned with the physical world." Science refers to a system of acquiring knowledge. This system uses observation and experimentation to describe and explain natural phenomena. The term science also refers to the organized body of knowledge people have gained using that system. Less formally, the word science often describes any systematic field of study or the knowledge gained from it. The purpose of science is to produce useful models of reality. Fields of science are commonly classified along two major lines:

- Basic sciences, the study of the natural world,
- Applied Sciences/ Engineering Sciences and
- Social sciences, the systematic study of human behaviour and social dynamics.

Science seeks to comprehend the nature and explanation of scientific knowledge and its ethical implications. It is a logical analysis of impression

upon our awareness. As such, scientific method cannot infer anything about the area of actuality that is ahead of what is visible by existing or theoretical means. When an expression of our reality earlier considered as supernatural is understood, in the terms of cause and consequences, it obtains a scientific justification. The fundamental goal or intention of science to society and individuals is to create useful models of reality. Thus, science is an emerging sector of understanding that permits us to compete more effectively with our environment, which in turn, will help us to develop holistically.

On the other hand, communication is a process whereby information is enclosed in a package and is channelled and imparted by a sender to a receiver via some medium. The receiver then decodes the message and gives the sender a feedback. All forms of communication require a sender, a message, and an intended recipient; however the receiver need not be present or aware of the sender's intent to communicate at the time of communication for the act of communication to occur.



Modus operandi : way of doing something

Communication is the *modus operandi* of dissemination of information or messages from oneself to another individual through mutual understanding. It is deeply rooted in human behavior and this constructs the society. In a communication process, information is first enfolded and the sender sends this information to a receiver with the help of some medium. Once the message is received, the receiver decodes it and gives the sender a feedback. In any form of communication there is always a sender, a message and a receiver. There are a few kinds of communication forms such as – (a) oral which includes speech, song, and tone of voice, (b) nonverbal which includes body language, sign language, paralanguage, touch, eye contact, and (c) writing. This and many other things about communication you must have come to know from our previous blocks. This block particularly concerns Science Communication.

In the first course of the MA in Jounalism and Mass Communicaton programme we have discussed in detail the concept of communication. You may remember that we have discussed a definition of communication which says it is what changes the human behaviour. So, when communication is used to inculcate scientific temperament among the general masses, then it is known as science communication.



Infotainment : Broadcast programmes which present news and serious subjects in an entertaining way



Edutainment : Products, such as books, TV programmes and particularly computer software that both educate and entertain.

From time immemorial man has always been trying to explore the reality. In fact, to make life wonderful, man has to constantly tackle the challenges from nature, which is the basic cause of the origin of science. Now we are living in a hi-tech age. *Infotainment* and *edutainment* are two known words. We have been successful in reaching to the Mars. We can dream about having a house on Moon. We have *Chandrayan*. We have nuclear power. But it is still a ridiculous irony when we somehow believe in the powers of the stones on fingers and blindly support all kinds of superstition. We usually stop the car whenever a cat crosses the road. The society mirrors the fact that people are intellectually bound to certain dogmas, myths, blind faiths and superstitions. These blind faiths cannot bring financial growth and economic empowerment to us but rather blindness to social, political and cultural slavery. An intellectually clogged brain can neither bring independence nor can defend his accessible economic, social, political or cultural liberty. In a country like India it is rare to find the common masses being imbued with a scientific temperament because science is not understood by them even though they may be aware of or inquisitive about the latest scientific and technological development. Science has remained a subject of academic discourse confined to the class room and has maintained a wide gulf from the common people.

The reality is that science is not reaching to the general people and denies its basic purpose to inculcate the spirit of rationality in the common people for whom science still remains an unfamiliar and alien area as the presentation of science by the experts to the non experts in an attractive, lucid and popular manner has not yet taken place the way it should.

In this context Michel Serres, a philosopher and member of the French Academy has emphasized the creation of a democracy of science. To increase societal knowledge on the role of science and to bridge the gap between science and society is extremely necessary. The media that calls itself the *vox populi*, decides on what to report or not to report but skips science broadcasts in the interest of attracting higher audiences. Science does not figure much in the current media rat race targeted for large audiences.

On the other hand, it won't be untrue to say that nobody enjoys science unless it is linked with the journalistic stuff of cuts and curls, covered with surprising and genuine facts, and flavoured with *piquant* instance through vivacious presentation. So there is an immense necessity of dissemination of science through media. Science communication means to acquaint the masses with scientific knowledge for inculcating scientific temper.



Piquant : Exciting and interesting.

1.4 DEFINITION OF SCIENCE COMMUNICATION

So, in the last section we have discussed that science communication means to acquaint the masses with scientific knowledge for inculcating scientific temper. Now let us turn to the definition of scientific communication.

T. W. Burns, D. J. O'Connor, S. M. Stocklmayer define the term science communication in their paper titled '*Science Communication: A Contemporary Definition*' in the journal '*Public Understanding of Science*' in their words : 'Science communication is a growing area of practice and research. During the past two decades, the number of activities, courses, and practitioners has steadily increased. But what actually is science communication? In what ways is it different to public awareness of science, public understanding of science, scientific culture, and scientific literacy? Science communication (SciCom) is defined as the use of appropriate skills, media, activities, and dialogue to produce one or more of the following personal responses to science (the AEIOU vowel analogy): Awareness, Enjoyment, Interest, Opinion-forming, and Understanding. The definition provides an outcomes-type view of science communication, and provides the foundations for further research and evaluation.'

According to Wikipedia, Science communication generally refers to media aiming to talk about science with non-scientists but those who make it are not necessarily scientists. They can have different backgrounds. Scientists communicating to one another, for example through scholarly journal articles is a form of science communication, but the term is usually applied to more 'public-facing' work. It includes science exhibitions, science journalism, science policy and science media production etc. It is sometimes done by professional scientists, but has evolved into a professional field in its own right.

Partly due to a market for professional training, science communication is also an academic discipline. The two key journals are *the Public Understanding of Science* and *Science Communication*. Researchers in this field are often closely linked to Science and Technology Studies, but they may also come from the history of science as well as mainstream media studies, psychology, sociology or literature studies. Agricultural is considered a subset of science communication from an academic and professional standpoint. Dr. Manoj Kr Patairiya has defined science communication in Indian context as "Science communication is the key to the real treasure of scientific knowledge, only by which the benefits of science and scientific temper could be carried to the common man, and thus the common man is benefited with the new advancements in various fields of science and technology and is able to fight against hunger, diseases, drought and social evils, like superstitions, disparity and illiteracy, with courage and self confidence."



CHECK YOUR PROGRESS

Q.1: Define Science Communication.

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1.5 IMPORTANCE OF SCIENCE COMMUNICATION

However, it is already felt that science is for the development of the society. But science should be communicated to the society, other wise the existence of science in the society will be meaningless. Here comes the role of science communication. Our society is swallowed up by various social evils like witchcraft, superstitions, misbelieves etc. One of the main reasons behind the prevalence of such evils in this twenty first century is the failure to analyse the society, especially the rural society in a scientific way. The responsibility lie not only with the elite and the intellectual and as educated class but also with the various media of our society. Here we need science communication

which can play an important role in building scientific temperament and thinking among the common people. It can uplift the people from the age-old superstitions and prejudices.

We are living in an age of unparalleled scientific advancement. The march of technology has brought science more closely into our daily lives. Without being aware of science and the positive reception of scientific progress in the public, it is not possible to balance science and the all-encompassing influences of beliefs. The role of science communication is very important here in bringing the achievements of science into the public notice as well as to the attention of important stakeholders such as politicians and industry. Science communication allows people to learn about exciting developments that can affect everybody. Information about science is necessary for taking educated decisions in a world dominated more and more by technological progress which directly influences the quality of people's lives. Popular science communication provides a bridge between the scientific community and the wider world, providing examples of the scientific method and success stories to the society at large and supporting the educational use of scientific products. Science communicators are preparing an instant meal of science results that can be easily digested by journalists, saving them the labuor of scanning hundreds of scientific formulas and they can easily feed such information to the common people. Science communication acts in the modern market place and competes with large commercial communication players such as the entertainment industry for space in the science and technical headlines. Science communication is also a political tool and consequently the pressure on the communicators is felt to be greater now than ever before.

1.6 NEED OF SCIENCE COMMUNICATION

We have already got some clear idea about the concept of science communication. Now, the question is why do we need science communication? Science communication is related to the change of common man's attitude towards science. Unless and until science is taken to the very root, that is the common masses, it is hardly of any practical value. But it will not be possible until and unless science is presented in a

simple and easily comprehensible manner, devoid of jargous and difficult scientific terms. The prevalent attitude to science is rather reverential taking it as something that an ordinary man cannot understand. It is necessary to change this attitude and to create a scientific attitude because of the following reasons.

- Science is woven into decisions that are made at every level of our lives. Knowingly or unknowingly, we rely upon science to make every choice. Unless approached scientifically, it will be very difficult for us to reach any conclusion. Scientific approach needs rational thinking.
- Science is also a part of our curiosity driven culture. Human beings are by nature curious. And they don't stop until and unless the curiosity is answered satisfactorily. And this curiosity can be answered satisfactorily only when we approach scientifically. On the other hand, this kind of curiosity also led to many landmark inventions and discoveries. But, in the absence of scientific attitude, curiosity doesn't arise at all.
- Science that both promotes development is for the use of the common people and it is scarcely of any value unless it is used for the benefit of the common man. Science limited to the four walls of a laboratory has no practical value unless it is utilized for a common goal.

But it will be impossible to fulfil any of the above purposes without bridging the gap between science and common masses with a proper effective and relevant science communication system.

In India, communicating science through various media is rather a neglected area. The field of journalism is also not an exception. In comparison to the western media, the slots and spaces dedicated to science related subjects in Indian media are much less. This can be owing to the following reasons.

- **Lack of necessary infrastructure:** It is a well known fact that that science journalism is not the one and the same with other forms of journalism. It required detailed study, technical establishments and technical equipment. But due to financial constraints or some other reasons, media houses or journalists can't afford to have such infrastructures.

- **Lack of necessary manpower:** Even if the said establishments and equipment are available in certain rare instances, the journalists are not competent enough to handle them. The lack of necessary manpower is one of the major barriers for science journalism.
- **Indifference of media persons to science:** It is the main reason behind the negligence of science in Indian media. Neither the journalists regard science as a subject comprehensible by the common people, nor do they think of science as something saleable. Fear of science as a complex matter may be a significant attention given to science by the media.

Let us discuss these points, in detail. Most physicists are not embarrassed to admit that they know nothing about biology. When it comes to biology, physicists are lay people. The same can be said about different fields within physics: a nuclear physicist may not know about electronics in detail. Even though it may not be possible to describe the scientific method to the public, it is certainly possible to describe what a particular scientist did in a particular field of work and this can offer some insight into the nature and value of scientific knowledge. Within science the dividing line between expert and layman is flexible and dynamic. The same goes for the rest of society. Looking at people in general, we can say that everyone is an expert in a few fields and there are infinite number of laypersons.

We can hardly to disagree with the enlightenment notion that more knowledge about anything is a good thing. However, many scholars have asked in what way, if at all, better understanding of science might help the public. Nevertheless, science is only one of the many ways that have been developed in order to help us, understand ourselves and our place in the world. One reply to this question has been the idea of scientific literacy, which is derived from the idea of basic literacy- a minimum level of reading and writing skills that people need in order to cope effectively with everyday life. Scientific literacy, by analogy, is the basic level of understanding of science and technology that citizens of a scientific and technological society need to know inorder to survive in and benefit from their social, cultural and physical environment. There are many arguments in favor of improved scientific literacy. For example, science is part of our culture and heritage and every one, therefore, has a right to have scientific knowledge.

Understanding nature can be a source of great pleasure. This is, after all, one of the reasons why people make decisions about scientific and technological policy matters every time they vote. However, some sociologists of science who study the way in which the scientific community functions as a producer of knowledge have said about which what can be given the status of science. The status of science is given not because of any quality intrinsic to knowledge itself or because of the way it is produced; but because of the way the scientific community subsequently tests and endorses or rejects it.

The role of the community in the drawing of scientific conclusions, replication and peer review, gives scientific knowledge its authority. Thus the structure and workings of the scientific community play a large part in the task of separating that information called scientific from the information that doesn't. If the public are to understand scientific information, and if they are to be able to distinguish the genuinely scientific from the only apparently scientific, then they need to understand not only the methods of science, but also the workings of the scientific community. Scientific literacy, then, has three aspects: (i) it consists of an understanding and knowledge of the facts of science and technology, (ii) of the way in which knowledge is produced, and (iii) of the way in which the scientific community decides what is and isn't science.

Many of the choices people make every day on a personal level require some scientific knowledge: what to eat, how to travel, how to heat their homes, how to safeguard their health. Without scientific and technological information it can be difficult to make even these comparatively simple decisions. The public as taxpayers and consumers pay for the products of science and technology. In this regard, the eminent science writer Issac Asimov said : 'without an informed public, scientists will be no longer supported financially, but also they will be actively persecuted'. Wider scientific knowledge might also assist to decrease the huge expenditure of treating preventable diseases, cleaning up pollution and providing crash public education programmes in times of crisis. Any nation that relies for its prosperity and security on science and technology based industry and services needs both an abundant contribution of the scientists and the public who hold the science based industries.



CHECK YOUR PROGRESS

Q.2: Why does media not give emphasis to science related issues in India?

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1.7 LET US SUM UP

In this unit you have been introduced to the concept of science communication. The definition of the concept is defined in the unit. The concept and the importance of this type of communication for the masses is also discussed here which will help you to understand the use and benefit of science communication in media.



1.8 FURTHER READING

- Handbook of Science Communication by Wilson, Overseas Press.



1.9 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q. No. 1: T. W. Burns, D. J. O'Connor, S. M. Stocklmayer defined the term science communication as- 'Science communication is a growing area of practice and research'.

Ans to Q. No. 2: In comparison to western media, the slots and spaces dedicated to science related subject in Indian media are very less. The following reasons are responsible for this;

- **Lack of necessary infrastructure:** It is a well known fact that that science journalism is not the one and the same with other forms of journalism. It required detailed study, technical

establishments and technical equipments. But due to financial constraints or some other reasons, media houses or journalists can't afford to have these infrastructures.

- **Lack of necessary manpower:** Even if the said establishments and equipments are available in certain rare instances, the journalists are not competent enough to handle them. This lack of necessary manpower is one of the major barriers for science journalism.
- **Indifference of media persons to science:** It is the main reason behind the negligence of science in Indian media. Neither the journalists regard science as a subject comprehensible by the common man, nor do they think of science as something saleable. Fear of science as complex matter becomes sometimes becomes a very significant reason in this regard.



1.10 POSSIBLE QUESTIONS

Q.1: What do you understand by science communication? What is the importance of science communication? Explain citing examples.

Q.2: What is the role of media towards the concept of 'science communication'? Explain in your own words.

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