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A STUDY OF SCIENTIFIC COMMUNICATION AND ITS ACADEMIC IMPORTANCE

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INTRODUCTION TO SCIENCE, COMMUNICATION AND SCIENCE COMMUNICATION: According to me, basically the two words Science and Communication depicts together communicating science from known to unkown[1]. This research paper is mainly focus on any scientific term or phase is having no ambiguity in research communication.

***Science* is a systematic enterprise that builds and organizes knowledge in the form of testable explanations and predictions about the universe. *Communication* can be defined as the exchange of ideas, information and knowledge between sender and receiver through an accepted code of symbols. "communication is the essence of science."[2]**

There are different types of communications which are Extrapersonal Communication, Intrapersonal Communication, Interpersonal Communication, Organizational Communication, and Mass Communication. *Scientific communication* is one of them which is explaining anything or any topic through a way of science.

DEFINITION

"Science communication generally refers to public communication presenting science-related topics. Science communication can aim to generate support for scientific research or study."[3] Or "Set of processes through which the outcome of (academic) research is distributed and archived for the benefit of present and future researchers."[4]

NEED OF SCIENCE COMMUNICATION[5]:

- ✓ Science communicators work in many areas, in diverse media and with diverse precedence, but all will need to light up science in the context of a changing and challenging world.
- ✓ Except confident in comprehension of science subjects, the students want to go for either arts or commerce. Most of the common men want to escape from the science. They claim science is not that much easy to understand. But this is cannot be denied that science is very much necessary for common masses.
- ✓ From the above reference, should we think that the science background people don't not feel any problem from Science? No, not at all. Doctors admit very spontaneously that

[1] http://www.slideshare.net/anamikadady1/science-communication-48781918?from_action=save
[2] http://terpconnect.umd.edu/~cpikas/878/Pikas_The_Impact_of_ICTs_on_ISSC_0506.pdf
[3] https://en.wikipedia.org/wiki/Science_communication
[4] http://www.fondationuniversitaire.be/common_docs/Dekeyzer2.ppt
[5] http://www.slideshare.net/anamikadady1/science-communication-48781918

they know nothing about engineering. Even the person from chemist background may not know computer science or botany.

- ✓ So if science background having people do not know each other subject, then we must think about the situation of a lay person.
- ✓ Here we need science communication and here the strong effort of science communication is felt. Sometime the detail description of scientific method cannot be possible but it is possible to give brief input from the scientific work in favour of value of scientific knowledge.
- ✓ Even within science there are expert and layman. The same goes for the rest of society. Considering the condition of general people, we can say that everyone can only be an expert in a few fields and those people feel themselves as laymen in other fields.

Science communication represents the diffusion of knowledge on science-related topics among professionals and to the public.[6]

Type of Scientific Communication:

Science crucially depends on communication of results from one scientist to the other![7] Between qualified professional experts communication takes place in these two basic forms as well: (1) orally: Presentations at scientific events (such as colloquia or conferences) (2) written: Articles in conference proceedings or scientific journals or in monographs (books) and reports.

Scientific research takes place in public or commercial scientific institutions, e.g.,

1. Universities and other academic schools, research centres and institutes
2. Research departments in industry (e.g., Microsoft Research)
3. Scientific communication takes mainly place in scientific meetings (conferences, symposia, workshops etc.)
4. Scientific journals (or magazines)
5. Lecture series in scientific institutions

Scientific language is at least in computer science nearly exclusively English. There is hardly any informatics literature in other languages! Conference contributions are submitted several months before the conference date. They are reviewed by a group of experienced scientists called the program committee of the respective conference. Quality is maintained by this form of mutual reviewing („peer reviewing“). This process characterizes scientific communication in particular. Scientific journals are issued by publishing houses in regular intervals (monthly, quarterly, bi-anually etc.) organized in volumes (one or more per year) and issues.[8]

Examples of good scientific communication Cholera inference, spatial analysis of economic and social data, GIS software, and scatter plot to demonstrate causal connections.[9] Below example is a technique of scientific communication.

[6] http://www.sp-exchange.ca/2014/04/18/spe-april-networking-event-science-communications/
[7] http://www.iai.uni-bonn.de/III/lehre/vorlesungen/IntelligentIS/SeminarIIS_SS14/ScientificWork_A.pdf
[8] http://www.dtc.umn.edu/~odlyzko/doc/future.scientific.comm.pdf
[9] http://www-personal.umd.umich.edu/~delittle/scientific%20communicationandvisualreasoning.ppt

Figure 1 : Example of Technique of Scientific Communication

Apart from journals and proceedings, there are other forms of scientific publications (e.g., books and monographs, dissertations, or technical reports, which are often not reviewed at all.

The process of scientific communication:

The process of scientific communication resulting from user's expressed needs for information and in particular the formal mechanisms for the storage and retrieval of information in response to queries or requests.[10]

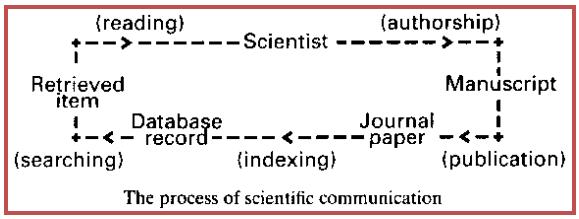

Figure 2 : The Process of Scientific communication

One of our concerns in developing a science of information must be the scientist's perception of the information environment, and the selection and use made of sources, channels, and modes of both obtaining information and communicating ideas.

Objectives of Scientific Communication:

- ✓ To inform
- ✓ To educate
- ✓ To enlighten the path from unknown to known
- ✓ To create a debate
- ✓ To start conversation
- ✓ To prepare common public to accept the change
- ✓ To involve the general public
- ✓ To encourage participatory communication for common goal
- ✓ To provide critical investigation and analysis.
- ✓ To bridge up the gap among the scientist, non scientist and public

Existence of Science Communication:

- ✓ Exhibition
- ✓ Live programming
- ✓ Via information technology

[10] http://archive.unu.edu/unupress/unupbooks/uu07ee/uu07ee0f.htm

- ✓ Lectures
- ✓ Hands on activities
- ✓ Field based projects
- ✓ Trainings
- ✓ Public consultations/debates
- ✓ Science Cartoons
- ✓ Posters
- ✓ Leaflets/booklets/books
- ✓ CD-ROMs
- ✓ Cultural programmes
- ✓ Audio-programmes
- ✓ Internet
- ✓ Telephone
- ✓ Via various mass media
- ✓ Electronic Journals (E-Journals)

Scientific Communicators need to Knows:

- ✓ Use of language as effective tool
- ✓ The coordination among language, values and knowledge
- ✓ Style of discussion/ conversation with the target audience
- ✓ Metaphorical situations (purpose, audience, occasion, and genre)
- ✓ Modes of effective communication (logical, ethical, and emotional appeals);
- ✓ Techniques of debate as well as the way of present himself/herself.
- ✓ Required communication skill.

Importance of Scientific communication:

- ✓ Engineers and technical specialists need to communicate technical issues effectively to non-specialists
- ✓ Managers need accurate information
- ✓ Managers need clear understanding of technology choices and alternatives
- ✓ Managers need to be able to make appropriate inferences and predictions
- ✓ Varieties of scientific communication through databases, graphs and charts, maps analysis tools, technical reports, recommendations, statistical analysis

Science Communicator communicates with:

- ✓ With media regional/national/international level.
- ✓ With Government (Central/State)
- ✓ With industry
- ✓ With common masses
- ✓ With the world

Strategic of Scientific Communication:

A strategy provides answers to ‘what?’, ‘why?’ and ‘who?’, but a plan concentrates more on ‘when?’ and ‘how?’

- ✓ Outcome oriented

- ✓ Based on Science only
- ✓ Target audience oriented
- ✓ Participatory Communication Approach
- ✓ Advantage and assistance oriented
- ✓ Better to link with multimedia
- ✓ Use of sound technology
- ✓ Patronizing society development
- ✓ Need practical sustainability
- ✓ Cost effectiveness

Science Communication Organizations in India:

- ✓ National Council for Science & Technology Communication (NCSTC)
- ✓ Vigyan Prasar(VP)
- ✓ Indian Council of Medical Research (ICMR)
- ✓ Indian Research Fund Association (IRFA)
- ✓ Indian Space Research Organisation(ISRO)
- ✓ Indian National Committee for Space Research (INCOSPAR)
- ✓ Defence Research and Development Organisation (DRDO)
- ✓ Indian Council of Agricultural Research (ICAR)
- ✓ Department of Agricultural Research and Education (DARE)
- ✓ Satellite Instructional Television Experiment(SITE)

CONCLUSION:

- We encourage other academic communities committed to improving science communication to implement courses incorporating explicit training in communication of science to a general public audience as part of basic science curricula at the undergraduate and graduate level.
- It is not sufficient to rely on science journalism of literary researchers to be responsible for the public understanding of science. Scientific communication is involving limitation of discipline-specific jargon and active engagement with the target audience to determine their level of knowledge. However, these skills can be developed in parallel with scientific content knowledge and research training, hopefully with a synergistic impact on aspiring scientists.[11]

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