MEETING REPORT

# Science Writing Workshop*

Current Science organized the third science writing workshop recently. There were fourteen participants in the workshop consisting of faculty members from universities, scientists, research fellows, and copy editors of journals.

The motivations of the participants for registering in the workshop were varied. Some who wanted to write better scientific papers, some wanting to use the skills for improving public understanding of science, some who looked forward to improving writing of grant proposals. They had been oriented to the workshop through discussions in a Google Group in March. The issues discussed were science and constitution, science and policies and programmes of the Government, institutional infrastructure for scientific research in India, and comparison of scientific research in different countries... So the participants knew each other. This helped to create a cohesive environment for group work.

P. Balaram, former editor of *Current Science*, gave the keynote address. He mentioned that science writing is not very different from any other writing. Stressing the importance of vast and varied reading for those who wanted to become writers, he referred to many books and articles that would be useful to participants. He also explained the process he followed for writing editorials in *Current Science*. He remarked that respecting the deadlines that come every 15 days is easier than having to face the deadlines every day as newspapers do. He challenged the participants with famous first lines and last lines of celebrated authors, giving broad hints about the manner of attracting attention and then being able to leave the readers with thoughts beyond the text. Like every batsman has a style of his own, every writer has his or her style. He told the participants not to initially bother too much about grammar and punctuation, but to pick up the rules as one continues reading and writing.

Giridhar Madras (Chemical Engineering Department, IISc, Bengaluru) gave an overview of the structure of a typical scientific paper and then went on to describe the best practices and traditions that have evolved in writing each part of the scientific paper. The sequence of writing each part need not be the same as what a reader might see at the end. So, for instance, materials, methods and results may be the first to be written. It is better to spend some time organizing the results. Reporting the sequence of experimental results may differ from the actual historical readings of data. What one expects to read in a paper is the logic that ties up the findings. He explained the need to be aware of the issue of word count for different types of scientific writing which may vary from journal to journal and the importance of reading instructions to authors, if there are any, before finalizing the paper. A part of rejections by a journal is initiated at the editors' desk itself. The editors decide whether a paper should go through the process of peer review. As the editor of a journal, he explained that the covering letter and the introduction are, quite often, enough for the editorial decisions. Sometimes, the references cited also give cues for the editor. Once it goes to a peer reviewer, the process becomes more detailed. He explained the reasons for rejections at this stage. He gave many real life examples of good and bad writing as well as good and bad ways of presenting results in the form of charts and tables. The participants vied him with questions.

The participants were then exposed to higher level issues related to scientific publishing. They participated in an Editorial Round Table organized by the Indian Academy of Sciences. Officials from the Taylor & Francis Group of journals presented the issues they were facing, rapidly increasing output of scientific research in India, the emergence of predatory journals, the need to make science more easily accessible to a wider audience in the shortest possible time, the breakdown of business models... The participants came to know some of recent developments in the scientific publishing industry.

Shobhana Narasimhan (JNCASR, Bengaluru) talked about different ways of structuring the same content and how the meanings that are conveyed by such rearrangements differ from each other. She engaged the participants with an online survey on the one hand, and on the other, presented cartoons and other graphics, and gave anecdotes from her own experiences of writing and drew lessons training her Ph D students to write better. In an interactive manner, she made the participants realize the importance of structuring the content to convey the right meaning. And that it is possible to write a paper that tells a story.

R. Srinivasan (Editor, *Current Science*) said that communicating science through written word is necessary for different purposes. It can be for communicating one's findings to other scientists in the same field; at times it can be for explaining one's area of expertise to scientists from other fields, and if possible, communicating the advances in science to the public. Quite often scientists are called upon to write grant proposals and submit reports to funding agencies. The purposes of writing science and the target for each type may differ. And as scientists, we need to adjust to the expectations and demands of each type of writing. His presentation focused on scientific papers and reviews, project reports and grant proposals. His insightful suggestions on writing titles to writing references, writing for scrutiny by committees that contain non-specialists, were all spiced with anecdotes from his own journey from being a Ph D scholar to his first paper to editor of journals and member of committees.

Karthik Ramaswamy (Archives and Publication Cell, IISc) talked about the discipline required to write science: keeping aside time exclusively for writing, the planning required before starting to write and the process of writing itself. Using cartoon strips to highlight the way academic writing tends to become opaque to readers, he went on to demonstrate how easy it is to rewrite what one has written to make it comprehensible to a wider readership. Removing words, phrases and even sentences, identifying the noun and verb clause, bringing

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together the subject and verb, making sentences more dynamic, creating interconnections between sentences... – he gave a wide variety of tricks and tips for editing scientific articles. The three sessions conducted by him were interactive. Participants were actively involved, asking questions and clarifying doubts, taking notes in spite of being promised a copy of the presentations.

The present reporter who also organized and co-ordinated the entire workshop used the remaining sessions in the workshop to orient the attitudes of the participants towards science. He discussed the essential characteristics of science as against knowledge which is non-science. He also stressed the importance of keeping distinctions between science and technology, and understanding the philosophy, history, sociology, politics and economics of science, etc., which were missing in the education of the participants.

The ability to ask questions, the most important first step in science was provoked using a game of asking why and how about natural phenomena. The critical spirit in science that enables and even encourages refutation of accepted theories and hypotheses was demonstrated with examples.

The ability to access and process information is vastly improved by using ICT tools. The participants were made to search the Web of Science for recent published works of Indian scientists. They were made to choose three papers that they would like to report as news items in the column, 'Science Last Fortnight' in *Current Science*. After discussions, each participant homed in on a topic to write on.

They were made to do searches using Google and Google Scholar to get the background understanding needed to understand the paper that they had selected. The methods of effective and efficient search, the techniques to manage the knowledge unearthed through this process using software tools were also practised by the participants. The sign posts that spell credibility and authenticity of the websites, the need to distinguish between credibility and reliability of an information so gathered and the ethical responsibilities of science writers, including plagiarism, were discussed.

The participants filed their stories on a *Google Doc*, read each others' output, and provided feedback on structure and flow of ideas. Read the output in 'Science Last Fortnight', 25 April issue of *Current Science*.

The participants were reminded that it is easier to write 300 words based on a paper. Once proficient in creating a flow and structural unity in 300 words, they would be provoked to write longer pieces of 1800 words, reporting trends in research with up to 10 references. Synthesis of contents from 10 papers is easier than writing a full-fledged scientific review with a hundred or more references. As with participants from earlier workshops, they would be slowly coached to undertake harder tasks and mentored in the art of writing science.

At the end of the workshop, this is what the participants had to say:

'This workshop has totally changed my view of science.'

'It completely changed my attitude towards science and related issues.'

'It changed the way I read and understand a paper, the way I write science and the way I look at subjects and disciplines.'

'This workshop helped me connect science with life, like never before.'

'It moved out of the textbook format and connected to my reading and understanding of science.'

'This workshop made me realize that science is not universal truths. Everything needs to be critically evaluated.'

'While science itself is helpful in dispelling many myths, it is helpful to have a critical attitude while reading and writing science.'

'Sometime on the road to science, I probably forgot to question the existing beliefs and ask questions. This workshop has instilled in me the scientific spirit to question.'

'I also realized that "experts" need not always be correct, and that if "non-experts" develop their reading habits, they can *and should* (as science communicators) question even the "facts" accepted as scientific.'

'I realized that with constant reading, one can improve one's understanding of fields of study outside one's own. A formal degree is not essential to understand the basics.'

'The importance of reading for a budding writer was emphasized in the workshop. It has inspired me to read more books.'

'I came to know about the importance of background reading. Also about integrating various literary skills in writing science.'

'Science writing was beyond my scope. I never thought I could write any science article confidently. This workshop helped me to look at it as a craft/skill rather than an innate talent.'

'Earlier I used to write in a complex manner so as to get it published. Now I realize that communication should be simple and easy to follow so that it reaches a large audience.'

'It also exposed me to the golden rules of science writing.'

'This workshop has indeed improved my knowledge of science and the art of writing.'

'It exposed me to so many books and experts. I found my techniques have completely changed while writing an article.'

'It also gave me an insight on how to write and edit to add aesthetics to my writing.'

'I could see how to connect lines and paragraphs and to maintain the structure and flow.'

'The workshop has familiarized us with the necessary elements of structure, style and content and also methods to adopt writing as a day-to-day practice than an occasional exercise.'

'(1) Taught me *how* to convey more with less words. (2) I learnt how editors think! and I now know the basics of editing. (3) For the first time, grammar was explained to me in a writer/editor context and *not* as theory. (4) Learned effective researching and writing strategy. (5) Learnt about timelines while writing, and how to stick to them ... actually there is a lot more...'

'Now I can focus better on the perspectives of readers and the message to be conveyed.'

'In short, writer's block is cleared.'

Srinivasan distributed the certificates. He said that more such workshops would be held to improve the quality of Indian scientific journals.

G. Madhavan thanked the participants and the people behind the organization of the workshop and, most importantly, K. P. Madhu who did all the work to organize and conduct the workshop.

*Current Science* hopes to organize the next workshop from 7 to 12 August 2017 in Bengaluru.

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