

Workshop on science writing*

Advances in science and technology affect every aspect of our day-to-day lives. Hence, communicating science to different groups, be it scientists, policy makers or the general public, becomes extremely important. Science writing plays a significant part in communicating science to such groups. Short-term workshops normally aid scientists and researchers in understanding science, interpreting results of research studies and communicating the findings in a simple and effective manner so as to prompt action by the target audience.

In an effort to improve the quality and quantity of Indian research output, the Current Science Association, Bengaluru held a science writing workshop recently. Twelve participants from various fields of science attended the workshop. Welcoming the participants G. Madhavan (Current Science Association) talked about the functioning of *Current Science*, its accomplishments, challenges and constraints. The next six days of the workshop saw K. P. Madhu (K.P.M., coordinator of the workshop) and other guest speakers cover varied topics related to science writing.

In the opening session, K.P.M. talked about science, technology and innovation, and the ways to distinguish amongst them. He then demonstrated the use of critical thinking and logical reasoning to shake the commonly held beliefs of the participants on various scientific topics such as ozone hole, climate change and female foeticide. The takeaway from this session was the ability to learn, to question the answers. The participants were then made to put down three 'why' questions in writing. The reason for this was to encourage them to overcome the inhibition of asking questions. These questions were later examined and grouped into relevant areas.

In the next session, K.P.M. talked about communication. He laid out the communicators' dogma starting from the

simple, specific and known to the complex, general and unknown. He covered the differences between teaching and communicating science, and also general principles to follow while communicating scientific information involving numbers, mathematics, definitions, terminology and nominalization of verbs. He encouraged participants to learn to read quickly and provided techniques to improve reading speed. He also offered a reading prescription to the participants to improve their vocabulary within a few months.

K.P.M. provided the structure of scientific papers and the mechanism to read such papers published in journals. This was done to ensure effective reading and comprehension prior to writing an article. He also presented a step-by-step mechanism to writing a scientific paper. In understanding and reporting science he talked about the sources that can be referred to for writing articles such as journals, annual reviews, textbooks and encyclopaedias.

In the next session, K.P.M. laid out the 'search–research–read–reflect–write' steps to writing an article. For each step he explained the process to be followed and tools that facilitate the same. He provided useful tips to carry out efficient and effective searches on the internet and ways to recognize the authenticity of sites while searching for information. In a practical session, the participants were allowed to choose a scientific paper to report. They were taught to use search tools such as Google and Google Scholar, scientific databases such as Web of Science and other tools such as Evernote and Mendeley prior to writing the paper.

He also spoke about media content in terms of technology, technique, processes, genre and aesthetics. He talked about the structure of a play, a film and newspaper report – all of which have the outline of a story. The key learning was that any written article needs to carry a story. He talked about the art of storytelling, the questions the story should answer, and language in terms of the words and sentences used. He encouraged participants to use words implying

logic and/or space–time to connect the sentences to improve the flow and create an impact. He also provided simple tips to help participants write well.

He then took the participants through an editing exercise. Each participant was made to edit 2–3 lines from a badly written scientific paper. They learnt to break the sentences in constituent parts, rearrange them for better comprehension, remove unnecessary words and connect the sentences better to maintain flow of thought.

The next session on storytelling was conducted by Shobana Narasimhan (Jawaharlal Nehru Centre for Advance Scientific Research, Bengaluru). She conveyed her thoughts on storytelling during an on-line survey that polled opinions of the participants on different aspects of storytelling. She asked the participants to communicate any writing as a story in a simple and clear manner. She also talked about the principles of a mind-map and concept-map in storytelling and urged the participants to start from the known aspects of a scientific paper.

Rohini Godbole (Centre for High Energy Physics, Indian Institute of Science, Bengaluru) talked about women in science. She initially drew the attention of participants to the social aspects of science such as plagiarism, misappropriation of funds and granting authorship to people who have not written the paper. She also talked about gender parity in terms of status and goals, and indicated that there needs to be a change in the societal mindset and more favourable policies to address these issues. She supported crèche facilities in research institutions. She also indicated that if both husband and wife are researchers, policies may be made favourable so that husband/wife can follow the spouse in the same organization. Also, for women on a career break, she suggested that the number of years of experience as a scientist needs to be taken into account while employing the candidate.

Karthik Ramaswamy (Archives and Publication Cell, IISc) gave a session on writing well, why it is important and the reasons for bad writing. He indicated that

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the key to good writing is to start with something familiar to the reader and end with an emphasis that is newsworthy while moving from the anxiety to anticipation phase of reading. He also provided good exercises and insights to tackle and simplify long and complex sentences. He stated that the important things to focus on to achieve cohesion in a paragraph were the topic at hand, the body of the text, good transitions, conclusion and coherence.

The participants took part in a mock editorial board meeting wherein they presented the scientific topic chosen for writing. Each participant presented the problem statement and the work carried out by the researchers in the chosen area. Questions were posed by the other participants and suggestions provided to improve the content of the article being written.

In the last session, K.P.M. ensured that the participants had established the title, target audience, communication channel and organization/body that would take action based on the article. This enabled the participants to address and argue their points in a better manner in their

respective articles. He concluded the session with the use of determinants, models, voice, tense, punctuation and language in writing.

Madhavan proposed a vote of thanks and distributed certificates to the participants. He also mentioned that the journal intends to organize many such workshops in other parts of the country as well and hoped that some of the participants would come forward to host such events under the auspices of the Current Science Association. This was followed by an on-line feedback session by the participants who rated the workshop from very good to excellent. The participants reported a marked improvement in areas such as accessing and managing scientific information, reading and understanding scientific papers, organizing and structuring scientific information, writing clearly and being able to edit better.

The participants of the workshop had this to say about the workshop:

The workshop has made me question the answers.

The workshop has improved my knowledge and my writing skills.

I have learnt more about science writing, editing, language, clarity, research papers, etc.

I will keep in mind who my audiences are and how to target them.

This workshop was a huge opportunity for me to learn about scientific writing. It will help me write research papers, articles, popular articles and blogs.

I will use the skills and knowledge gained for writing popular science articles and editing manuscripts.

I will use the skills and knowledge gained in scientific writing and popular science writing.

The output of the workshop in terms of articles written by the participants will appear in the 'Science Last Fortnight' section of the 10 September 2017 issue of *Current Science*.

Current Science plans to organize the next workshop from 4 to 9 December 2017 in Bengaluru.

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MEETING REPORT

Geochemistry, environmental and sedimentary geology*

One-day seminar on the 'Contemporary ameliorations in the field of geochemistry, environmental and sedimentary geology' was organized recently at Department of Geology, Aligarh Muslim University (AMU), Aligarh. J. N. Goswami (formerly with Physical Research Laboratory, Ahmedabad) was the Chief Guest of the occasion. He delivered a keynote address on the formation and evolution of the solar system and its non-resemblance to any exo-solar sys-

tem. Further he also discussed how the age of the solar system has been redefined using isotopic elements as a tool. This was followed by another interesting lecture on tectonic framework and evolutionary history of the Bengal basin by A. B. Roy (M.L. Sukhadia University, Udaipur). He explained that this basin had its own evolutionary history that cannot be linked with any known crust-building process. Moreover, even before the Brahmaputra and Ganga rivers drained water from the Himalaya along with huge loads of sediments, the basin had its own antecedent drainage pattern. The session further proceeded with an informative talk by Somnath Dasgupta (Jamia Millia Islamia, New Delhi) about growth and sustainability of metamorphic petrology in India during last four decades. Rajiv Nigam (National Institute of Oceanography, Goa) appreciated the uniqueness of the seminar in the sense that it encompassed a vast range of top-

ics, including evolution of the early solar system to the recent developments in geology till date. He talked about the application of foraminiferal studies for the reconstruction of Holocene sea-level fluctuation for a scientific explanation of the existence of ancient Indian coastal cities. Citing the examples from Lothal (a Harappan settlement near Ahmedabad), Gulf of Khambat and Dholavira (Gujarat), he explained that sea-level fluctuations played an imperative role in shaping their destinies. M. B. Verma (Atomic Minerals Directorate for Exploration and Research, Department of Atomic Energy, Government of India) delivered a talk on the prospects of uranium exploration in Siwalik foreland basin of Northwestern Himalaya. Four principal potential uraniumiferous belts were suggested: Kheyra–Asthota–Loharian and Galot–Loharkar in Hamirpur district, Himachal Pradesh (HP), Rajpura–Polian, in Una district, HP and Panav–Naugajiyā-

*A report on the 'National Seminar on Recent Advances and Challenges in Geochemistry, Environmental and Sedimentary Geology' held at Department of Geology, AMU, Aligarh on 27 February 2017 (under DRS-II, UGC Programme), coordinated and convened by L. A. K. Rao, AMU and A. H. M. Ahmad, AMU respectively. The event was sponsored by UGC, New Delhi, Oren Hydrocarbons and AMDER, Govt of India under the assistance of organizing secretary of the seminar, M. E. A. Mondal, AMU.