Helping scientists to write, publish and present

Yateendra Joshi

Despite the emphasis on publishing in high-impact-factor journals, researchers in India have few opportunities to learn the technique of writing research papers, especially for the more prestigious journals. An effort to create such opportunities is described, drawing upon the experience of conducting training programmes on publishing skills for researchers in more than 30 institutes and universities in India and the Middle East over the past 15 years. Suggestions are also offered on participants, ideal faculty, and contents of such programmes.

Keywords: Scientific communication, skill building, training, writing research papers.

'WHATEVER I had learnt so far about writing research papers was from other scientists, mostly my mentors and seniors. But today, I learnt something from a manuscript editor – and that was quite different.' It was this casual remark by one of the scientist-participants in one of the training programmes I have been conducting for scientists that set me thinking. Perhaps it is the difference between learning by doing, between learning from practitioners, the way one learns how to cook from one's mother or grandmother, and learning through formal instruction, or learning from a professional coach. The two approaches have their pros and cons, and through this article I would like to share with readers of *Current Science* what I have learnt from the second approach over the past 15 years or so, mainly to get some feedback on how such formal instruction can be improved. The takeaway from this article is simple enough: learning by the first method is far more effective *after receiving some formal instruction*. I also hope to do for *scientific* communication what K. P. Madhu has done for *science* communication through his article titled 'Experiments in skill building for science communication'[1]. All the observations that follow are based on dozens of programmes, lasting from a couple of hours to 1–2 days to a week to a full semester, that I have conducted mostly for research institutes and universities. The number of participants varied from 8 to 10 to more than 250.

Topics covered in training programmes

The core contents of the programmes were drawn from about 15 topics, some core and some peripheral. For instance, handling citations and references was among the core topics whereas dealing with printing and commercial printers was a peripheral topic. Some other topics were:

Yateendra Joshi lives at Bldg A-1 Flat 702, Landmark Garden, 78 Kalyani Nagar, Pune 411 006, India.
e-mail: yateendra.joshi@gmail.com

(i) organizing data into tables, (ii) common errors in writing English, (iii) using punctuation, and (iv) using Microsoft Word. A topic that ought to be covered in such programmes but was not (owing to lack of competence) is statistical analysis. A topic covered in nearly all the programmes, no matter how short, was publishing research papers in high-impact-factor journals. This is hardly surprising, and Madhu too found it a major motivating factor for those who participated in the training programmes he conducts[1]. To give readers a clearer idea of the topics, a few are briefly described below.

Publishing research papers in high-impact-factor journals

Research papers published in peer-reviewed journals remain the single most often used criterion to evaluate scientists. These days, this is often supplemented with citation counts and impact factors. Publishing papers can be a game of snakes and ladders but a well-prepared manuscript submitted to an appropriately chosen journal will find more ladders and fewer snakes in its path. The session seeks to explain the detailed instructions journals expect their authors to follow and shows how to win the game by answering these and similar questions.
- How do I select the right journal for my paper?
- What are the most common reasons for a paper being rejected without a review?
- How long should I wait after submission to enquire about the paper's fate?

Reporting numbers and quantities in text

Counting and measuring set science apart from other pursuits. Yet, the minutiae of communicating quantitative information are often ignored in programmes on writing skills. Despite more than sixty years of metrication in India, the precise conventions of the SI system (Système

International d'Unités) are often violated by writers of research papers. The session on numbers offers answers to these and similar questions.

- How should multi-digit numbers be printed (123,000 or 123 000 or 1,23,000)?
- Which is the recommended symbol for the litre, L or l?
- When should data be rounded off drastically and when not at all?

Handling citations and references

If you have ever been exasperated by a journal's insistence that you follow its style exactly in formatting references, this session shows you how to manage this task more efficiently and answers these and similar questions.

- When do I use *et al.* in citations?
- What is the difference between references and a bibliography?
- How do I cite web pages and other electronic documents?

Becoming a more competent writer

Scientists are required to write not only research papers but also project proposals and reports, and even articles for magazines. Good writing is not merely error-free writing but effective writing – writing that gets you the results that you want. Yet, writing is not often taught as a skill that can be acquired with practice. The session presents a systematic approach to becoming a more effective writer[2] and answers these and similar questions.

- What are the characteristics of effective prose?
- How long will it take me to be a better writer?
- What strategies do good writers use to explain hard-to-follow concepts?

Pedagogy of training programmes

The programmes were designed with both short-term and long-term benefits in mind. The short-terms benefits included tips on best practices that participants can start applying right away to make their writing more effective whereas one of the long-term benefits was a road map to becoming a more competent writer.

Whenever possible, the contents were customized based on prior study of sample publications from the host institute. The programmes are practice-oriented and essentially consist of examples of good practice and poor practice presented along with clear explanations of what sets the two apart; theoretical, experimental, and technical underpinnings to the explanations; and – in programmes with a manageable number of participants – practice exercises to apply the principles and techniques learnt during the programme.

Another part of customization was that the topics were chosen by the institute that commissioned the training programme from among the list of 15 topics mentioned earlier, 4 to 5 topics to be covered per day. The more intensive programmes were those comprising five days of instruction with the last day reserved for a final examination. The semester-long programmes covered more topics in greater detail and typically consisted of two lectures a week. The ideal schedule consisted of 3 hours of talks each morning for 5 days, the afternoons being devoted to assignments to be completed by the participants – a homogeneous group of 6–8 Ph D students – in their own time but within 24 h.

The more formal programmes also involved formal evaluation: of the participants through short tests and a final examination and of the faculty through structured feedback and ratings. In the shorter programmes, evaluation was either absent altogether or comprised a short response sheet filled in by participants or some short assignments completed and evaluated on the spot within the overall time allotted for the programme.

Evaluation

To me, the most serious shortcoming of these programmes is the lack of any quantitative and systematic measure of their effectiveness. Although the feedback was always positive and in one instance the teachers said they noticed a distinct improvement in the output of the batch that had been trained over that of the previous batch, it remains uncertain whether the programme led to such tangible benefits as fewer 'desk' rejections by journals (rejections without any peer review), shorter processing time between acceptance of the final version of a paper and its publication, and any favourable comments by readers of a re-designed newsletter or annual report (document design being another topic included in some training programmes). On the other hand, a frequent and encouraging comment made by many research guides and thesis supervisors was that I had relieved them of the tedium of explaining the minutiae of citing and referencing.

Comments and feedback

Faculty

Experienced editors of interdisciplinary journals – or even of specialist journals for that matter, depending upon the participants – are perhaps ideally suited to conduct such programmes because they not only have first-hand research experience but also know what journal editors want. Their position also suggests that they are

not so devoted to research or single minded that they would be unable to find the time and the inclination to teach researchers how to write research papers. Experienced reviewers should also make potential faculty for such programmes. For a programme on writing skills, it is perhaps natural to think that faculty drawn from languages will be particularly suitable. However, such faculty is rarely able to strike a rapport with participants.

Participants

By definition, the courses were training programmes, designed to impart specific skills. This objective limits the number of participants, and the course contents were less suitable for delivery through conventional classroom lectures. Also, the programmes offered little to participants with no prior experience of reading research papers – let alone writing them – but were particularly suited to those who had published a couple of papers, had also faced some rejections from the more prestigious journals, and whose job required them to continue publishing papers, preferably in high-impact-factor journals. I also noticed the marked differences in willingness to learn, participation in the classroom, and commitment between those for whom the course was compulsory and those who had *opted* to participate.

Time constraints

Writing, like other psychomotor skills, is a skill that can be acquired by systematic practice and refined through yet more practice; but practice takes time, and without making that investment of time, it is unrealistic to expect improvement. A key input for becoming a better writer is reading, which is time-intensive. Taking the average length of a non-fiction book at 50,000 words and the average reading speed at 150 words per minute, it will take about 4.5 h to finish that book: the readers of this article can do their maths. The Extensive Reading Foundation estimates that to become a fluent reader with near-native proficiency in a second language involves reading more than 1.5 million words[3].

Another way to think of the effectiveness of such training programmes is to relate it to the four pillars of learning suggested by Dehaene, namely Attention, Active Engagement, Error Feedback, and Consolidation[4]. Whereas good trainers can manage the first, and the last in fact requires longer durations, the second and the third pillars are only possible when the number of participants is limited – and can be more effective if online engagement is leveraged (Strategy 2 advocated by Madhu[1]). Ideally, such engagement should follow a training programme and be continued over a few months, over which the instructor can give individual attention to each participant. However, the logistics and the budget for such interaction will need to be worked out.

The way forward

The recently published national framework for publication[5], while focusing on access, also begins its recommendations by mentioning the need for 'serious and sustained effort towards capacity building and towards enhancing the credibility and visibility of Indian Journals'. Presumably, this includes Indian scientists also. This article will have served its purpose if it prompts the three national academies that prepared the above-mentioned framework, agencies of the central government such as the DBT and DST, and such umbrella organizations as CSIR, ICAR, and ICMR to develop a concrete action plan to train researchers in India to write, publish, and present.

1. Madhu, K. P., Experiments in skill building for science communication. *Curr. Sci.*, 2019, **116**(3), 366–371.
2. Joshi, Y., A systematic approach to improving writing skills. *Curr. Sci.*, 2007, **92**(10), 1343–1344.
3. Extensive Reading Foundation, ERF Library calculator. https://erfoundation.org/wordpress/wp-content/uploads/2018/07/ERF-Library-Calculator.pdf
4. Dahaene, S., *How We Learn: the New Science of Education and the Brain*, Allen Lane (Penguin Books), London.
5. Chakraborty, S. *et al.*, Suggestions for a national framework for publication of and access to literature in science and technology in India. *Curr. Sci.*, 2020, **118**(7), 1026–1034.