

Teaching communication skills in English for scientists in India

With reference to the recent letters in *Current Science*^{1,2}, let me correct a misconception that a course on communication skills in English for scientists is not taught anywhere in India. Actually such a course was first introduced under my initiative in 1983–84 in the University of Poona, when I found that both me and my students had difficulty in understanding one another. In collaboration with C. Daswani (Department of English), I developed a course on communication skills in English for scientists and introduced it to M Sc Zoology students, and later to students of M Sc Biotechnology. In collaboration with S. B. Gokhale and Grace Jacob, the course was extended to

M Sc Botany students in 1995. It has been included in the proposal for a five-year M Sc in Life Sciences³. In 2001–03 it was introduced to M Sc Zoology students, at the Karnatak University, Dharwad, and I have been teaching the course since 2005 to Ph D students at the Institute of Genomics and Integrative Biology, Delhi. In the nineties, the British Council, India, had also followed such an effort under the title ESP. After teaching this course for 23 years to over 1000 postgraduate students, and training over 250 science teachers under the Academic Staff College, I must confess that, while students tend to acquire good communication skills, the course met with considerable

resistance from postgraduate science faculty. Both the structure and contents of this course are available to anyone who so desires.

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1. Sarma, V., *Curr. Sci.*, 2007, **92**, 1029.
 2. Kozak, M., *Curr. Sci.*, 2007, **92**, 1659.
 3. Modak, S. P., *Curr. Sci.*, 1996, **71**, 961–967.
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SOHAN P. MODAK

*Institute of Genomics and Integrative Biology,
Mall Road,
Delhi 110 007, India
e-mail: spmodak@gmail.com*

Importance of rhetoric in S&T communication

Several editorials in *Current Science* in the recent past bemoaned the lack of communication skills amongst Ph D students and authors submitting manuscripts to journals. These editorials led to a spate of correspondence from senior scientists putting forth their views based on experience and first-hand knowledge. It is believed that lack of communication skills is due to poor knowledge of English grammar and composition. However, communication skills require much more than mastery over the language of communication. A. S. Parasnis¹ identified correctly that the problem is not only because of poor knowledge of English, but is more deep-rooted. To quote: 'learning Hindi did not jeopardize our learning English and the mother tongue well. I have found that people who speak and write poorly in English, also write so in their mother tongue'.

In my opinion what Indian authors, especially science and engineering students, lack is the ability to present their ideas in a coherent manner in the correct sequence, so that the output is clear and comprehensible to the readers. This is due to both poor language and presentation skills. This is the reason why the number of papers by Indian authors in frontline journals, especially international ones, is less. In spite of good work output, there

has not been proportionate increase in the number of quality papers.

My own junior colleagues, some of them with MS/M Tech degrees, have asked me how to write papers. Though I direct my colleagues to the library or the Internet to refer to the relevant 'how to' books on the subject, I feel there is a need to teach this from the student days. The ability to present the ideas well, either orally or in written communication, is a skill which may not be present inherently in every scientist. Even though a person may be a good scientist/engineer, he/she may not be good in writing/presenting the work to others, simply because he/she has not learnt how to go about doing so. Such skills, if taught as a part of college education or even later, will help everyone: the scientists, the organization they work for and also the editors of journals!

What is needed is not only education in grammar and composition, but also in rhetoric. Rhetoric is a method for training effective communicators. It is related to logic. While logic can be said to be the science of propositions and demonstrations, rhetoric is the science of persuasion. It involves trying to convince the audience, change their opinions or points of view and bring them round to the writer's way of thinking. To impress the readers, the writer has to first arrange

thoughts in a logical manner and then lead them step by step to the conclusion.

Historically, rhetoric was taught as one of the original liberal arts or the 'trivium'; the other two were dialectic and grammar. Dialectic concerned itself with testing and invention of new knowledge; grammar dealt with the correct, accurate, pleasing and effective language use, and rhetoric was about persuasion in public and political settings. In the context of Indian S&T research communication the first element is taken care of, while the second and third definitely need to be attended to.

Though originally rhetoric was applied to spoken language, its definition has expanded greatly since it emerged as a field of study in the universities. The study of rhetoric has recently entered other fields such as humanities, social sciences, science and journalism.

A good example of convincing writing in science is the book *Silent Spring* by Rachel Carson who was voted by *TIME* magazine as one of the 100 most influential persons of the twentieth century. This book is credited with launching the environmentalism movement in the West. It inspired widespread public concern with pesticides and pollution of the environment, and facilitated the ban of DDT in the US. On the other hand, the Chal-

lenger disaster is partly attributed to communication failure. The technical experts were apprehensive about the cold weather launch, but could not convince the decision makers; ultimately several valuable lives were lost because of an O-ring.

In the Indian context, there is no doubt that scientists need communication skills throughout their career, whether in the University setting or in government-funded research organizations. From defending their theses to preparing project proposals to presentation of achievements to assessment boards for promotion to submission

of progress reports to review committees/funding agencies to the highest level of submission of annual plans for allotment of budget; each and everyone needs to present the case in a convincing and clear manner to achieve the desired results.

Presently, such communication skills covering language, rhetoric, style, etc. are not taught to scientists and engineers in India at any level. Logic as a subject is an option in undergraduate science courses in some universities. The recently introduced subject of 'Communicative English' in an autonomous college in Bangalore is hugely popular. Here the students learn

how to write prose for a variety of purposes. Serious thought needs to be given about having a similar course in 'Technical Communication' as a part of science and engineering curricula.

1. Parasnis, A. S., *Curr. Sci.*, 2005, **88**, 847.

ANURADHA RAVI

537, 6th A Cross,
HAL III Stage,
Bangalore 560 075, India
e-mail: anuradharavi_2000@yahoo.com

On the plight of research and teaching in state universities

In the last few decades, scientific research in Indian universities has gone from bad to worse. Thanks to the policies of the Government, which treat universities with prejudice and give undue privilege to research institutes as far as allocation of funds is concerned. There was a time when UGC was the only grant-giving body which funded research at both the institutional and university level. However, now there are many institutions like CSIR, DBT, DST and ICMR, which fund scientific research in India. Though more funds are available, their allocation seems improper; majority of the funds goes to the research institutes and the universities remain starved as before.

The argument of the Government funding departments regarding distribution of funds is that since there is almost no quality research in universities, lesser amounts of funds are allocated to them. What they fail to recall is that the cost of chemicals, laboratory equipment, their maintenance, etc. have gone up several-fold. How can one do good research without these? So in absence of funds there is no good research and vice versa. This forms a vicious circle and universities become the victim.

If we see the condition of research in state universities, especially in North India, the condition seems grim. Although UGC provides some funds but the matching grants by the state government remain pending for years. As a result, the UGC grant also remains unutilized and is often returned by the university. Some teachers at the universities get funds

through projects, but this number is small. And in any case research at any institution cannot be based on one or two stray projects. There should be a full-fledged system to promote research. Practically no funds are available in the state universities to pay research scholars a stipend, which would motivate more students to pursue research. No special arrangements are made for the chemicals needed for research work. The authorities make do by sparing some of the practical resources available for the graduate and postgraduate practical classes. Each year, we find this number increasing. So the total funds are now inadequate to fulfil the demand.

There was once a time when a dedicated worker only needed to put in hard work to do good research. This does not hold good anymore. Now state-of-the-art infrastructure and expensive chemicals are needed to ensure that one is not left behind. Moreover, shortage of staff has also become a death knell for research at the university level. For instance, almost no new appointments have been made since the last decade in most of the universities owned by the UP Government. However, the number of students continues to increase each year. With more and more students qualifying at the plus-two level, the Government directs the universities and colleges to accommodate them. The corresponding increase in teaching facilities, better infrastructure as well as appointment of new teachers is lacking. In order to restore the correct teacher-taught ratio, the Government should also create new posts for faculty in proportion

to the increasing number of students, according to the guidelines of the UGC. Otherwise the situation would get worse each year.

A shortage of teaching faculty lays great burden on the available teachers, who have to take more classes. This leaves almost no or little time for research activities. How can one expect an over-burdened teacher to do any good research? Moreover, since a new teacher joins the department a long time after most of his predecessors have left (since there were no new appointments in between), he is not able to get proper training from the first line of devoted workers. Thus, he has to waste a lot of time getting used to the stressful conditions where he has to teach a large number of students. The motivation for good work remains as low here as in any other Government department, which makes him only an average worker over his entire service period.

Since the avenues for getting a job at the university level are so low, most of the bright students take to other careers, leaving the less brighter ones to come into this field. Research scholars have to pay for most of their requirements from their own pocket, and thus few are able to do good research. The motivation level for a research scholar is also low, since the opportunities for job are few. Most of them are aware that they will have to work on an ad hoc basis for a paltry sum of money. Now, if there is no quality research in universities, it should not come as a surprise.