

Training in technical communication

A scientist's need to express his/her thoughts clearly and present his/her case convincingly does not stop at Ph D thesis. A scientist working in a research laboratory has to prepare proposals to get projects sanctioned, interim progress reports for appraisal by funding agencies and closure reports. The last one, summarizing the findings of the project and outlining the scope for further work in the field, if prepared well, serves as a decision-making tool. The failure to convert most of our lab-level R&D successes to large scale development (transfer of technology) can be attributed partly to poor documentation (specifications, user manuals, etc.). Thus there is an urgent need to train our young scientists in this area.

'Technical communication' is the delivery of technical (read scientific) information to readers (or listeners or viewers) in a manner that is adapted to their needs, level of understanding and background. It addresses most of the issues raised¹⁻³ –

grammar, punctuation, different forms of writing depending on the end user, preparation of journal articles including various standards for citation of references, editing for style, content editing, copy editing, and now, web page development.

Indian children learn the basics of letter writing, copy writing for brochures, advertisements, etc. in business communication at high school level but technical communication (TC) is not part of the curriculum at the degree level either in pure science or in engineering colleges. TC, as a subject, is taught in 38 US universities; some even have PhD programmes. There are many online courses for beginners (www.io.com, www.worldwidelearn.com). It is interesting to learn that IBAB has already begun the good work.

A certain level of language and presentation skills in employees is a requirement in the software field. The employees have to demonstrate their proficiency before becoming eligible for bonus/increment.

Apart from the famous TOEFL, other international level proficiency testing agencies (www.brainbench.com, www.languagetesting.com) are there.

I feel customized skill-development workshops can be conducted in R&D establishments in the short-term and tests administered to gauge their effectiveness. In the long-term, if TC can be introduced at degree level, it would be wonderful!

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Non-citing to an Indian paper in superconductivity

Citation indexing and citation analysis are considered important in information retrieval, science policy, and historiography and sociology of science¹. The number of citations received by a paper or a group of papers (by an individual author or a team) is taken as indicator of the worth and influence of the paper or the group of papers. Sometimes such citations may be negative citations where a paper is cited just for the reason of reporting or criticizing or debating (as was in the case of cold fusion). At other times citations may be just apparent citations not having any real value. In such a case a paper is cited for finding support for a claim or if a claim in the cited paper is apparently accepted as correct. After some time (may be a few months or a few years) the claim is found to be unsubstantiated. A paper by Ovshinsky *et al.*² received 244 citations till date and it was declared a citation classic by the Institute for Scientific Information, Philadelphia, USA. This claim was later found unworthy. But it is very difficult and sometimes improbable to detect or identify

significant papers which are apparently ignored or neglected and receive either zero or a very small number of citations. Such cases of non-citability or non-citations usually happen with papers originating from third world countries. Long ago J. C. Bose wrote (April 1921) that the 'courts of recognition and justice in the matter of science' (in the context of the work he was doing) are in the west. Discourses are accepted only in European languages³. This is true (or truer) even today. It is much more difficult for a scientist working in a third world country to receive citation and gain recognition than a scientist working in a first world country. We know a number of classic cases of non-recognition and non-citation. J. N. Mukherjee (colloid and soil chemist), G. C. Bhattacharya (a self-made biologist, a D. Sc. *honoris causa* of the University of Calcutta who worked in the Bose Institute), and E. C. G. Sudarshan (the theoretical physicist) are three cases of such non-citational scenario. In some cases when a first world scientist or a scientific team works further on a topic

already worked out by a third world scientist, citations are mostly given to the first world scientist even if the first world scientist cites the third world scientist in the first place.

In course of our study on superconductivity literature we have recently come across a spectacular case of non-citation in superconductivity. In 1968, N. Kumar and K. P. Sinha wrote a seminal theoretical paper on possibility of photoinduced superconductivity in semiconducting or insulating state⁴. Sinha, Kumar and collaborators published five other papers on the same topic and cited this paper in each of them. The paper has received 23 citations of which 13 are by Indian authors. But all these 23 papers were published in *SCI* journals. Sinha (with Shrivastava, K. N. as the first author) also wrote a review article titled 'Magnetic superconductors – model theories and experimental properties of rare-earth compounds' which mentioned the paper. The review published in *Physics Reports*, has so far received 22 citations in *SCI* journals.

Between 1989 and 1992 five experimental papers⁵⁻⁹ were published confirming 'transient or metastable photoinduced superconductivity in cuprate systems' as was predicted by Kumar and Sinha. None of these five papers has cited the paper of Kumar and Sinha. These papers have received 52, 107, 6, 85 and 5 citations respectively. Interestingly, other four papers have all cited the paper by Yu *et al.* We have collected all these five papers and checked their references. There are only three references dating back to 1960s one each in Yu *et al.*, Kudinov *et al.* and Sugiyama *et al.* We have tried to find out case of indirect citations to Kumar and Sinha's paper from these five papers, but have failed. These papers have referred to a few papers on photoinduced increase of conductivity in semiconductors. All such papers are experimental and one or two of them indicate possible transition to superconducting state (transient).

We chanced upon this situation when we made a list of significant contributions in superconductivity since 1911 till date and included Kumar and Sinha's paper in the list. The experimental results of the phenomenon as apparently predicted by Kumar and Sinha theoretically were considered by us as vindication of the theory. But on further search we have found the non-citing by authors of all those five papers.

On the other hand Sinha has referred in later papers to one or more of these experimental papers. Apparently, A. V.

Narlikar found out this lapse of non-citation and drew the attention of Sinha, as told by Sinha in a short paper in *Indian Journal of Cryogenics* which is not an *SCI* journal¹⁰. The paper was actually presented at the National Symposium on Cryogenics, held in Calcutta in 29-30 March 1993. Sinha also wrote a further paper on the subject in 2000 (ref. 11). This paper has not received any citation so far.

It may be interesting to study different cases of non-citations to significant contributions. However, this would be a tremendously tough task because there is no easy mechanism for detecting cases of non-citation to significant papers as also there is no other easy mechanism of knowing a paper to be significant other than through citations.

The message of this study is that on many occasions the later day authors of scientific papers 'miss' or fail to 'recognize' an earlier paper not 'apparently in full sight'. Do non-citation to a potentially citable paper occur for being at a temporal distance to become invisible, or for originating in a less visible marginal environment of the third world, or for negligence on part of the potential citing authors or for imperfections of the search mechanisms for previous potential items in literature or for all these causes acting together? We should identify as many cases of non-citation as possible and make proper studies in sciento-sociography to understand causes of non-citation so that the chances of non-citation may be eliminated or at least significantly reduced.

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Science societies: Are they democratically undemocratic?

There has been an interesting factual analysis made by Peter J. Heaney¹. He has tackled two important issues: (i) Are scientists engaged in the society affairs? and (ii) How much democracy do we need in our scientific societies?

The immediate thought while reading the article was to introspect on the conditions of some of our own scientific societies in India and their methods of governance. Probably, these very questions if posed before the governing personalities of some of the Indian science societies, can lead to interesting answers. The mechanism and the bye-laws framed in some societies are

such that while the Fellows of the society can nominate the names for various offices of the council, it is the prevailing council members who stand as the authority to select and or shortlist the names for election! The list they finalize for election shall have no extra names, leaving no options for the fellows who are the non-council members other than to merely be the rubber stamps to cast their vote of acceptance. Thus the elections for the governing council shall be a farce and democratically undemocratic.

The conclusive statement of Peter J. Heaney 'what is beautiful about democ-

ratic (science) societies is also what is terrible of them: they are as successful or as ineffective as the people who participate' can in reality be true for many of our societies that are democratically undemocratic.

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