



INDIAN ACADEMY OF SCIENCES

Scientific Values: Ethical Guidelines and Procedures

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1. Preamble

Most professional bodies such as societies, associations, and academies expect their members to follow the highest ethical values in the conduct of their professional work. These values are based on universal moral principles like honesty, truthfulness, and fairness. For each profession, these values get translated into a separate 'code of conduct' statement. Such codes provide guidance on expected behaviour from the members under different circumstances and enhance the credibility of the profession in the perception of the public. They also tend to define an ideal which each member could strive to attain.

The same ethical requirements apply to the scientific profession also. Science has many applied branches like engineering, and medicine, each having its own professional society and its own detailed code of conduct. These codes are based on the same basic moral principles but differ in detail because of the different activities of various societies.

The Indian Academy of Sciences has decided to concentrate primarily on those aspects which impinge directly on the activities normally pursued by its Fellows. Thus the major areas covered in this document include research, development, training, science management and policymaking. The activities pursued by the Fellows not only involve conducting research and publishing its results, but also interacting with students and trainees, colleagues and collaborators, members associated with science management and policy making, as well as with the press and the public. They also involve peer review, editorial work, as well as activities associated with development and management of technology. Each of these interactions has serious ethical implications. The Fellows of the Academy have to remain sensitive to them while dealing with various situations encountered in the course of their professional work.

This document has also paid special attention to the ethics involved in committee work in which many Fellows of the Academy participate. Science administration, management and policy-making too have received adequate attention. In all these areas, compromise on ethical behaviour can have a highly deleterious influence on the general atmosphere of the practice of science, and can result in a negative perception of the scientific profession.

Various areas of concern to the Fellows of the Academy are; (i) conduct of research; (ii) publications; (iii) training of students; (iv) interaction with the public; (v) science management; and (vi) ethics in technology-related issues. All these have been briefly discussed below. Mention has also been made of the positive role played by “whistle-blowers”.

2. Conduct of research

The following activities pursued by scientists can be organized under this topic.

2.1 Data collection

While conducting research, whether independently or jointly, it is necessary to ensure that data collected are reliable, properly recorded, and stored (even raw data) and there is absolutely no attempt made for either fudging data, or recording false data. The procedure followed should be described in enough detail that the results permit independent verification. Wrong data when reported in literature can cause confusion and in the short run may even prevent new ideas from being proposed. Generating, recording, and reporting false data are fraudulent practices and need to be discouraged in all possible ways.

2.2 Sharing of facilities

In most institutions, expensive items of equipment are few and have to be shared with other colleagues. Unfortunately sometimes this does not happen even when the equipment has been procured on the express promise that it would be used jointly. There is a consistent complaint of denial of adequate access to equipment, particularly from junior colleagues as the person in charge makes disproportionate use of it for his/her own personal research. Fairness should be shown by following transparent procedures for time allotment.

2.3 Experiments involving human beings or animals

Guidelines and protocols announced by the various national agencies should be scrupulously followed. See for example, the announcements on “ethical guidelines for biomedical research on human objects”, “use of laboratory animals in research and training”, “transfer of human biological material for research and development, stem cell research and therapy, and others which are available on the websites of Department of Biotechnology (New Delhi), Indian Council of Medical Research (New Delhi), the Ministry of Health, Government of India, the Indian Council of Agricultural Research (New Delhi) and the Medical Council of India.

3. Publications

Associated with publications, there are a number of issues like dishonesty in reporting, credit sharing with colleagues and students etc where ethical behaviour is very important. Some of the important issues are mentioned below:

3.1 Plagiarism

Appropriating the already published results of others without proper reference is obviously dishonest. When exposed, plagiarism generally receives the highest publicity and the authors concerned and the system they belong to are put under tremendous pressure. In most cases, the concerned authors offer some explanation in their defense. However, sometimes they disown responsibility and even the knowledge of the papers' existence, claiming that the co-authors included their names without consulting them. Such disclaimers should not be accepted at face value, but should be looked into in more detail. Nobody should communicate a joint paper without the knowledge of the other authors. There is a strong need to take punitive actions to discourage plagiarism. There is a general impression among the scientific community in India that those who indulge in this form of dishonest behaviour do not receive appropriate punishment, and escape relatively unscathed. Stronger and more consistent action would redress this situation.

3.2 Duplicate publications

Sometimes an author publishes the same article at more than one place without mentioning that it has appeared before in the same or similar form. This practice is against professional ethics and must be avoided.

3.3 Order of authors

Some societies specifically suggest the order in which the names of authors should appear. However, the basic requirement from the ethical point of view is that each author should receive adequate credit. A transparent procedure of deciding the order should be formulated and followed scrupulously.

3.4 Undeserved authorship

Some scientists having administrative control over others permit or require their names to be included in publications and patents in which they have made no scientific contribution. This practice is not acceptable, as it is very much against the spirit of doing research and reporting results.

3.5 Purity of data

The data reported in a publication should be authentic and should not be based on biased observations or fabricated. It is necessary that sound data-collection practices be followed. Even if only part of the data is being reported, the complete data and computer programs, in their original form, should be retained.

3.6 Sharing responsibility among authors

Increasingly, papers are being published where expertise of many scientists has been pooled together. So much so that each one may have only limited knowledge of what has appeared in the paper. Thus in the case of misconduct regarding one of the sections, it may not be appropriate to hold all the authors equally responsible. It is recommended that the authors generate a written statement on the responsibility of each author. A copy of this document may be kept with each of the authors and used in case the need arises for fixing responsibility. In the absence of such an understanding, all authors should own equal responsibility for the whole publication.

3.7 Peer review

Many scientists act as reviewers for manuscripts submitted for publication as well as project proposals submitted for financial support. In both cases, they get access to information and ideas which have not yet been published. It is important for them to ensure that this advance access to information is not unethically exploited by them for their own benefit.

4. Interaction with the public

Scientists must ensure that statements made in public are dependable and balanced. They should avoid making exaggerated claims to the press or at public meetings. Scientists should be held accountable for the claims they make.

5. Training programmes

Most scientists are teaching as well as supervising research and are hence deeply involved in training programmes. The training is likely to inculcate higher ethical values in students if the institution concerned provides an enabling environment where honesty, truthfulness and fair play are practised as a matter of routine. Firstly, the training should be such that the student is continuously exposed to a high level of ethical behaviour. Secondly, special training should be imparted to them about contemporary ethical values. The major issues concerning the ethical environment are associated with teaching, assessing, distribution of students to various supervisors and the behaviour of potential role models.

5.1 Teaching and assessment

Teaching should be taken very seriously, with considerable effort being put in to communicate effectively with students. Above all, there should be easy access for the students to the teacher to clarify any issues. Student assessment should also be transparent and fair without any bias.

5.2 Student allotment and research supervision

While allotting students to various faculty members, the interests of both the students and faculty members have to be kept in mind. Different institutions may handle this differently, but to maintain fairness, the procedure for allotment should be decided and announced beforehand and should have the general approval of the concerned members. The procedure should be followed in a transparent fashion.

5.3 Direct ethical training to students

The Academy emphasizes the need for direct training of students as a way to generate an ethical atmosphere in research institutions. A number of methods may be employed, including special formal courses, discussions and workshops, formation of local ethical committees, and generating articles on ethical issues. Independent of their formal training, students tend to emulate their role models and their supervisors. If they see their role models indulging in unethical practices, the effect of formal teaching is likely to get diluted. Therefore direct ethical training needs to be supplemented by internal discussion and monitoring of practices.

6. Science management

A lack of ethics in science management can have very far-reaching deleterious effects on both research and education. As many of the decisions in this general activity are taken through committees, it is here that the highest standards of fairness and balance are required. Some of the areas which impact Indian science, and where committees make the basic recommendations, are concerned with recruitment, assessments and promotions, project grants, performance awards and science policies. Each one of them is briefly discussed below.

6.1 Recruitment and assessment

The quality of faculty decides the standard of an institution to a very large extent. Once a low quality recruitment has been made, the effect can last for many decades. It is unethical to discard candidates of higher quality and select others based on extraneous considerations. It is equally unethical to deliberately permit personal prejudices and biases to dominate during the process of selection. It may be noted that a selection procedure can be unethical even though not illegal, and therefore it is all the more important to remain sensitive to these issues while participating in the decision making process. The selection of committee members who are known for fairness and balance rather than pliability is important. It is unethical to discriminate, in recruitment of scientists (both students and faculty) on grounds of gender. Committees should make every effort to ensure that such biases do not enter into their decisions, and should be cognizant of the National Science Policy (Department of Science and Technology, New Delhi, 2003, www.dst.gov.in/st_policy.htm) in this regard. There should also be no bias against hiring spouses in the same department or institution. All the ethical guidelines mentioned above for recruitment are equally applicable for promotions.

6.2 Project grants

Most active scientists seek financial support for their research. The usual route is through submission, assessment and grant of projects. These projects are normally first peer-reviewed and then discussed by a committee. Sometimes even more than one committee examines the proposal before granting funds. As both peer review and committee discussions involve a certain degree of subjectivity, it is very necessary that the highest ethical standards are observed by committee members as well as referees. Decisions on grants based on biases of any kind are highly unethical.

6.3 Awards

In recognition of excellent performance there are awards instituted by the Government as well as by private bodies. To select one or two persons from a field of close competitors is indeed hard, and therefore it is important for the selection committee members to study each case carefully. To maintain the sanctity of these awards, unbiased decisions must be made.

6.4 Policy issues

Some decisions taken by the Government are based on inputs provided by scientists. Typical examples may be GM crops, stem cell research, human cloning and other emerging technologies. It is important that scientists provide honest and well thought-out views rather than giving in to commercial, social or political pressures. It is only when scientists maintain the highest ethical standards following the dictates of their own conscience, in all committees, that the credibility of the scientific community will be at the highest level.

7. Role of whistle-blowers

Some times individuals are forced to expose irregularities when the system remains indifferent or actively suppresses the misconduct reported by them. Such whistle-blowing needs careful investigation and follow up action. Whistle-blowers perform an ethical public function at risk to themselves and deserve not only protection but also our admiration.

8. Ethics in technology-related issues

There are a number of Academy Fellows who are engaged in applied research, involving technology development and commercialization. These areas have their own characteristic ethical issues, having to do with sustainable development, technology acquisition, sale and transfer of technology, sharing of intellectual property rights, industrial safety, and other matters like environmental loading. Existing ethical guidelines in specific areas must be identified and followed. One should also be sensitive to areas like dual-use technologies for which ethical guidelines are still being debated.

9. Regulatory mechanism

It is recognized that some incidents involving unethical behaviour are best handled locally. However, many types of misconduct like plagiarism are of special importance as they have an adverse effect on the credibility of the entire scientific community. Ideally, there should be a centralized scientific body to handle all issues pertaining to scientific ethics. In the absence of such a national body, the Academy has generated a regulatory mechanism, applicable to the conduct of its Fellows, and hopes that other institutions will follow similar procedures until a centralized body becomes functional. The final decision about the reported misconduct of a Fellow will be taken by the Council of the Academy, based on inputs provided by the Panel on Scientific Values constituted by the President of the Academy.

The detailed procedure to be followed is given below.

- A.** (i) Any complaint against a Fellow of the Academy should be addressed to the President of the Academy.
(ii) The complaint should be signed by the complainant and should have his/her complete address.
(iii) The complaint should be accompanied by appropriate documents authenticating the complaint.
(iv) The complainant should not publicize the matter until a final decision is taken by the Academy.
- B.** The President will decide about the suitability of the complaint for further processing.
- C.** If cause is found for further investigation, the President will obtain a declaration from the complainant that he/she takes full responsibility for the genuineness of the complaint and is prepared for consequences, such as exposure, in case the complaint is eventually found to have been filed with malafide intentions.
- D.** The President will then pass on all the documents, after suppressing the complainant's identity, to the Panel on Scientific Values of the Academy for a complete investigation.
- E.** The Panel will contact the Fellow against whom allegations have been received and obtain his/her version.
- F.** Should the Panel feel necessary, it can have personal discussions with the Fellow concerned.
- G.** The Panel may invite any expert, who can help in the investigation through his/her specialized knowledge.
- H.** The Panel, on completion of its work, will submit a report to the Council. This should be done within three months of receiving the documents from the President. In case the Panel finds the allegations to be substantiated, it can suggest possible penalties in its report to the Council.
- I.** The Council will decide on the actual action to be taken against the Fellow.
- J.** If the Panel concludes that the allegation was made with malafide intention, the President may disclose the name of the complainant to the Panel, which in turn will obtain the person's explanation in writing and also in person, if necessary.
- K.** In this case too, the Panel will submit its report to the Council containing appropriate recommendations.

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