

## Crisis in the Universities: Increasing Funding Gap between Universities and National Laboratories/Scientific Research Institutions – Some solutions

The enormous inequality of funding of Universities for scientific R&D compared to National Laboratories/Scientific Research Institutions was highlighted (*Curr. Sci.*, 2006, **91**, 1435–1436). When we compare India, in terms of scientific output, or even simply in terms of PhDs produced, with other Asian countries, a rapid decline is clearly evident. This therefore, has serious implications.

What are the solutions? Fortunately, many of the Central Universities and a handful of State Universities have excellent faculty and still attract comparatively better students. It is mostly these students who, after receiving a fair degree of training and education, are selected for leadership positions at National Research Institutions under the Ministry of Science & Technology or other Government agencies which have a significant scientific mandate. Some of these Universities have reasonable (though sub-optimal) infrastructure which is shared by a large number of faculty and students. When new infrastructure is given, there is no budget head for dedicated manpower to run such a facility or for assured maintenance of the same. On the other hand, in Research Institutions one finds far more equipment with dedicated manpower to man and service the same, plus adequate provision for annual maintenance contract. All this, ironically, with much less number of users.

As a first step, the Ministry for Human Resources Development (MHRD) should identify the top 10–15 Universities, based on measurable indices of excellence, as Centres of Excellence in Sciences. Of these selected Universities, those which were established by various Acts of Parliament of India should then be placed directly under the administrative control of the MHRD, Govt of India. This, in my opinion, may not really be a difficult thing to do. This may simply be an administrative arrangement purely for the purpose of funding which will then come directly from the MHRD and not through the UGC, as is the case for IISc, Bangalore or the recently established Indian Institutes of Science Education and Research (IISER). Such an arrangement, if effected will be truly advantageous to the UGC as this will enable the UGC to

focus on the remaining Universities and in the process will provide it with an opportunity to place a comparatively stronger emphasis on non-science disciplines.

Having identified the top 10–15 Universities as Centres of Excellence in Sciences the MHRD should then create a large Scientific R&D Fund for state-of-the-art infrastructure development. These Universities can then seek such large infrastructure funding with a proviso that such state-of-art equipment, once commissioned, are accessible, without any strings attached, to other Universities or autonomous colleges located within the same geographic region. This fund should also provide for manpower support and annual maintenance to ensure uninterrupted functioning of the equipment.

In order to attract the best of teaching faculty to these Centres of Excellence in Sciences, the pay scale and designation (Assistant Professor, Additional/Associate Professor and Professor) should be at par with those at the Indian Institute of Science, Bangalore. Furthermore, these Universities should be given the flexibility of making a fresh appointment at any of the three scales described above, as opposed to the present rigid entry level appointment as Lecturer, to appropriately qualified candidates with substantial and impressive post-doctoral experience. This will enable financial parity of appointment between a University and a National Laboratory and will therefore provide an opportunity to prospective faculty to choose between the two.

The fourth possible solution is to encourage scientists working in Research Institutions to work (and teach) for a short time in a University, and faculty working in Universities to work in a Research Institution. Such mobility provisions involving the scientific work force working at the National Research Institutions and the Universities will not only create an ambience conducive for co-survival but will also highlight and consequently mitigate problems within the respective institutions. Another corollary of this suggestion would be to locate future R&D institutions in close physical proximity or within a University Centre of Excellence – Institutions-sans-frontiers!

The fifth suggestion to bridge this technology divide is to grant Adjunct Faculty status to scientists working in National Research Institutions/Laboratories within the geographical area of an identified University Centre of Excellence in Science so that they are also involved in teaching and mentoring activities of students. On a reciprocal basis, the faculty at the University should also be recognized as adjunct scientists, so that they can also mentor students working in these R&D institutions and also have access to infrastructure available in such institutions. This will additionally ensure that National Laboratories/Research Institutions continue to be engaged in research, as mandated by their statutes, and at the same time have students who are duly registered for Ph D in the partnering University. The recent move to grant Deemed University status for National R&D Laboratories and Research Institutions has serious implications detrimental for the survival of both the Universities as well as National Laboratories/Research Institutions. This however, can be easily avoided if the above arrangement is put in place. The Universities in turn will similarly be benefited by continuing to be Centres for knowledge and innovation reinforced by excellent on-the-bench training using laboratory infrastructure of R&D Institutions. Such organic linkages between Universities and National Laboratories/Research Institutions will complement each other without stepping on each other's shoes. This will truly be a win-win situation for all and this indeed has been the recipe for success in the West where Universities continue to be the leading Centres for innovations and technology development.

The sixth suggestion is to create a University Innovation Fund to support basic research dedicated for University/College-based investigators showing potential for innovation. Such intensively peer-reviewed science innovation funding support system which should be established by one or more Departments of the Ministry of Science and Technology, should have no strings attached, though they must have clearly defined deliverables. The management of such Innovation Grant Scheme could be outsourced to one of the Universities. There are examples of such successful outsourcing and these include KVPY, DBT Post Doctoral Fellowship, etc. These Innovation grants could

be of a value up to 40–50 lakhs for about 3 years to cover the expenses for consumables and minor equipment and should be closely monitored in terms of performance with a provision for early termination if milestones are not achieved.

The National Science and Engineering Foundation being established as a consequence of SAC-PM recommendation with a planned budget of Rs 1000 crores should focus on promoting R&D in Universities rather than pumping still more funds in national R&D institutions funded by the various Departments of the Science Ministry.

The eighth suggestion is that R&D project funding to Universities should have 30% overheads provision to offset other costs which scientific R&D Institutions do not incur. Quite often overheads are used by the Universities to pay for specific demands of science laboratories such as air conditioning, specially treated water supply and other laboratory requirements. These, in National Laboratories, are part of their core budget.

Scientists working in R&D Institutions, unlike those working in the Universities, get generous international travel support from their own institutions and or from their parent Government Department. Hence, the final suggestion is to provide enough flexibility in such extramurally funded projects to university based investigators so as to enable them to travel and present their research findings in international meetings/workshops/conferences.

To conclude, it is very crucial that we address these problems and make a serious effort to bridge this ever-increasing technology and infrastructure divide between our Universities and National Laboratories/R&D Institutions. Failure to take immediate corrective action, I am afraid, will cause irreversible damage which we will severely regret later. To quote C. N. R. Rao, Chairman of the Scientific Advisory Council to the Prime Minister (SAC-PM), we must 'initiate a massive programme of rejuvenation of State and Central Universities' unless we are prepared to be a 'mediocre or a marginal performer'. It is indeed high time that our politicians take a serious note of Rao's warning bell.

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