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EDITORIAL

Promoting and nurturing post-doctoral research culture in India

Given the large geographical and more so the population sizes, India needs several folds more academic teaching and research institutions than existing. It is also estimated that as the population and the numbers of academic institutions of higher learning increase, the number of candidates seeking the doctoral degree would also increase. The current situation and the future projections about the demand and supply of Ph. D. degree holders, however, present multiple paradoxes. A large number of faculty positions are lying vacant in most of the colleges, universities and research institutions while a large proportion of those who are declared qualified to be bestowed with the Ph. D. degree remain unemployed. The vacancies are not filled in for a variety of mostly unjustifiable reasons. However, the more worrying reason for the large scale unemployment of doctorate degree holders is that many of them are not found to be academically suitable when the process for filling a vacancy is actually initiated. Another paradox is that while most institutions of higher learning and research in the country lament that the quality of students joining them has seriously declined in recent years, an increasingly larger proportion of students are successfully competing to qualify to undertake masters, doctoral or post-doctoral studies in good institutions abroad. Obviously things are wrong at many levels.

As a country, India remains far behind in research and developmental activities in science and technology. Although recent years have seen a significant increase in quality of science and technology related research contributions from India, these continue to emanate from isolated peaks of some excellence, especially when looked in the context of India's large population size and geographic area. Even these "peaks of excellence" are often not able to achieve their potential heights because a major share of research contributions is generated by those seeking a doctoral degree. It is universally agreed that Ph.D. research is a time-bound learning phase and, therefore, those pursuing doctoral research often work in domains that are less "uncertain". On the other hand, real "breakthroughs" often happen only when one wants to charter the "uncertain" domain. It is in this context that post-doctoral researchers can make significant contributions. However, India has almost completely failed to develop a culture of post-doctoral research within the country notwithstanding the fact that India remains a major "supplier" of post-doctoral research force not only to the west but, in recent years, also to the upcoming advanced labs in south-east Asia and Australia.

Many schemes of post-doctoral research, including the INSPIRE Faculty Fellowships, UGC Scientist programmes etc have been in operation in the country but they have remained grossly under-utilized. Why do young Indians prefer to go abroad for post-doctoral or even doctoral research when opportunities exist here also? Better work facilities which improve the chance of having some good research publications to one's credit, better money and living conditions and the charm of experiencing a new place and life-style are obviously some of the reasons for the preference for going abroad for "higher studies". However, a more significant reason is the perception that many of the better funded research and other institutions, like the IITs and IISERs etc, in the country often require a post-doctoral experience abroad for considering the candidature. Although often not formally declared, many institutions generally do not even consider the candidature of a young person for a regular faculty position unless he/she has some years of experience in a lab outside India. This common perception and practice obviously exerts a strong peer-pressure on the young scientists to seek a post-doctoral position abroad.

The common argument in favour of recruiting those with post-doctoral experience in labs abroad is that their international exposure would have widened their horizon and thus they would perform better in their own research compared to those who did not go out. Several of the well-endowed and academically well known research institutions in the country have facilities that are of "international quality" and they also provide an "international environment" through many visitors, collaborations and other means. If the atmosphere and work-culture alone were to make a good potential candidate, why are all of their doctorate products also have to go abroad before being considered for a faculty position? They could be considered for post-doctoral or faculty position within the country. But that is not happening. Therefore, is the perception/belief that an "international exposure" improves the capability of the young person as a future scientist justified? In my view the belief that the "international exposure" improves their research potential is not as strong an argument as it is made out to be. A prospective faculty/scientist needs to be judged, not only by the previous experience but more importantly, by his/her capacity to ask original questions, formulate and test the hypotheses and interpret the results to ask next set of questions. I believe these attributes depend upon the total learning experience (formal and informal) since younger age rather than only during the few years of post-doctoral experience. Therefore, the good potential of a young researcher would generally be visible even during the doctoral and/or post-doctoral work in India. We need those in authority to identify them and provide the opportunity so that they can blossom.

One has to also consider the indirect disadvantage and loss that the country suffers by preferring a foreign post-doctoral experience for hiring. In anticipation of better job prospects in Indian institutions, the best of the Ph.D.s generally leave the country soon after submitting the doctoral thesis. Only a small proportion of those who go out, can actually return back and succeed in getting a job of choice. A majority continues to remain in other countries either to spend a nearly life-long career of post-doctoral research or drift into something else while a proportion of them succeed in securing a faculty position in those countries. The notable point here is that those who succeed in getting a long-term faculty position abroad are generally the best of those who initially left. Consequently, those who return back are not always the best.

The gross under-utilization of the many post-doctoral positions in the country also follows from the fact that the appropriately qualified young persons are becoming less frequent and those better ones that still come out, in spite of the deteriorating academic system, are "exported"! The net result is that many of those left in the country remain unemployable. Instead of taking proactive steps to retain the best, the current practice unfortunately ensures that we lose the best and make do with what we are left with.

Country not only needs the best young scientists (and researchers in other disciplines as well) to man its many research institutions, IITs and IISERs but also good teachers and researchers in the large number of universities and colleges that we have and hope to add in the coming years. Unfortunately however, a worrying trend experienced in recent years is that most of those who return back from abroad, and even those who have obtained their doctorate degree from better endowed research institutions are rarely willing to join universities/colleges. This apathy to teaching institutions stems primarily from the poorer facilities and work-culture in the universities and colleges but also from the perception of many of the young scientists that teaching would adversely affect their research. It is of course to be expected that someone who has worked in a very well equipped and active research lab would find it extremely difficult to work under the poor facility and work-culture that in general continues to prevail at the teaching institutions in the country (Lakhotia, 2005). Such an unattractive situation obviously needs to be changed (Lakhotia et al 2013). However, at the same time it is necessary to mentor the young scientists that teaching does not really hinder research. Good teaching practices actually improve the quality of questions asked for research because of the wider reading and learning required for teaching. It is also to be realized that if the products coming out of teaching institutions are not trained and groomed well by their teachers,

the research institutions will suffer the brunt of the poor quality. This is already being felt and would become worse in coming years unless the state of university and college education is improved soon.

Therefore, we need to retain our best young brains within the country not only to work as post-docs to boost the quality of research of senior scientists but ultimately to let them blossom independently and mature into established teachers and researchers in their chosen disciplines. I firmly believe that if we can hire bright fresh Ph.Ds. for post-doctoral research or faculty positions within the country and mentor them properly and provide opportunity and responsibility in an encouraging environment, they would have the advantage of a head-start at a younger age. In view of their age, enthusiasm, novel ideas and the support, they are expected to really perform well and catalyze the substantial improvement in the quality of teaching and research all around.

An additional advantage of such hiring would be that the young faculty would get tuned to achieve under the prevailing local conditions and by being demanding, would help improve the bureaucracy and work-culture. More important would be that they would initiate research in novel areas, many of which may be of greater relevance to the country's requirements. Most of the post-docs who return from abroad are generally already imprinted with questions that are being addressed in the lab where they worked; they rarely get out of that shell to work in completely different and novel areas. Obviously, this situation more often produces followers than leaders.

Just as we need to shed our prejudice against "national journals" (Lakhotia, 2013, 2014; Chaddha, 2015), we also need to recognize the intrinsic quality and capability of a young person within the country. The quality of a research publication needs to be judged by what it is rather than by the cover under which it is published. Similarly, the potential of a person needs to be judged directly rather than by the quality of the place where he/she had worked before. The latter does have some bearing but just having worked in a lab abroad does not necessarily improve their intellectual skill and originality. By appropriately recognizing and rewarding post-doctoral research within the country, the quality and depth of research output from the country would substantially improve, and at the same time we would be training young leaders to work independently and innovatively. This is essential to bring about the desired change faster rather than let the mediocrity continue in academic institutions while aiming to have some semblance of excellence at a few places. Isolated peaks, as existing now, cannot sustain for long. A large workforce of competent, determined and innovative young researchers and teachers spread widely and evenly across the country is required. Promoting and recognizing good post-doctoral research culture within the country is essential to attain the required wider base.

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