



Why More Students Need to Do PhD and What Can be Done About It

India needs to increase the quality and quantity of its research. There are many compelling reasons for this, one critical one being its necessity for the innovation ecosystem. It is clear that economies have become much more innovation driven. And innovation uses new knowledge to generate value. (For example, algorithms created by machine learning researchers, are being used for innovation in a range of sectors and domains.) Furthermore, in the process of innovation, often knowledge gaps are found (e.g. best way to employ a machine learning algorithm to identify people not reporting their full income), which require further research to plug them. A thriving innovation ecosystem requires a research ecosystem which can generate relevant knowledge for local innovation, as well as plug the knowledge gaps. Given the pace of innovation, and the fact that with a lot of new research results there is tacit knowledge which resides with researchers, it is important that the research ecosystem should be close to the innovation ecosystem – one cannot rely on an external research to fully fuel local innovation.

Indian research ecosystem is relatively small and, while decent, is far behind the leading nations in terms of quality of research and capability. Perhaps the most important indicator of the health of the research ecosystem is the quality and quantity of the PhDs it produces.

In the US, which has the largest research and innovation ecosystem in the world, about 185,000 PhDs and about 2 million bachelors graduate in a year – i.e. PhDs graduating is about 9% of undergraduates. In India, the total number of students enrolled in undergraduate programs is about 28 million, and total number of scholars enrolled in PhD is about 140,000. We can estimate that less than 0.5% of graduates go for PhD. Clearly, this is highly inadequate – the size of the PhD program is not at all commensurate with the size of the higher education system or aspirations of the country.

There is no doubt that there is a need to increase the number of PhDs. The near term goal must be to encourage 1% to 2% of the graduating students to opt for PhD. But the increase should also be in the quality of candidates going for PhD. Shoddy PhDs from universities with weak research culture and standards will not help much.

For this we need to attract bright and talented graduates into the PhD program (currently many students who join PhD are those who could not get any employment, or want to prepare for some competitive exam, or are teachers who need a PhD for promotion, etc.). In addition, we should also ensure that they do a high quality PhD from a high quality Institution, as these institutions are likely to have systems and faculty for best quality PhD in the country. (In the US, top 50 institutions account for granting 50% of the PhDs). For this we must understand what can be done to attract talented students in PhD.

To understand what may motivate graduates, a small survey done a few years back of graduating BTEchs in some IITs regarding “what will they want in a PhD program to do PhD in India”. While better stipend, infrastructure etc were desirable, a top sentiment was “ability to spend a year in an overseas university”.

If we can provide Overseas Research Fellowships (ORFs) to our top universities to send some of their PhD scholars to global universities, it can attract some good students to join PhD program. The only condition for the ORF should be that the work done during the overseas period must form part of the PhD thesis, preferably under a joint PhD program with the overseas universities, or with a co-guide from the partner university. There can be some constraints on the partner universities also (e.g. they must be in global top 500.)

Applications from universities / institutions can be sought for this program (eligibility for applying can be: within top 100 ranked in NIRF, some NAAC score, etc), and only those who have rigorous PhD evaluation systems and good past record of producing quality PhDs, and have the capability and research record/standing to get into suitable arrangements with good overseas universities may be given some number of ORFs. If 100+ universities / institutions are given some number of ORFs each year, it can invigorate the PhD program in these institutions – not only will they attract higher quality PhD scholars, they will evolve partnerships with good universities globally. The total budget for 2500 ORFs each year (i.e. an average of 25 ORFs for each institution) will be \$50 Million @ \$20,000 for a year – which is, even by Indian standards, not a large amount.

Universities should be given committed ORFs for a few years duration (say 3 or 5 years). In the next round, the number of ORFs given to an institution can be based on the performance of the institution in the program – how many ORFs it was able to utilize, which type of universities did their students go to, number of joint publications, support provided by partner universities to ORF scholars, etc. This competition and regular evaluation will ensure that universities do their best in the program.

Given that ORFs can only be with the good universities in the world, which are not likely to dilute their standards, this will push for higher standards for the PhD students availing of the ORF. Also, this process will ensure that only decent and active researchers guide these students, as only such faculty from good institutions will be able to find a co-supervisor or collaborator to guide the student availing the ORF.

Another key advantage of this program is that the student is enrolled as a PhD student in an Indian institution, and goes only for a year to overseas university, and then returns to complete the PhD. A student who goes for a year after spending 1 or 2 years, is likely come back to finish the PhD, unlike earlier PhD fellowship programs where the student goes abroad for PhD, gets a PhD from an overseas university, and then finds it easy to just stay there. Also, in these collaborative programs, there is genuine collaboration, which can lead to other collaborative research projects.

In summary, we need to attract talented students to do PhD in top institutions in our country, while ensuring that they do good quality research. Without increasing the quality and quantity (and variety) of research, India risk playing perpetually the “catch up” game. For attracting talented students, top institutions in the country can be granted some number of ORFs for their PhD students, using which these students can spend a year with a high quality global university. Such an initiative can increase the number of PhDs significantly, improve the quality of work done in PhDs, and enhance collaboration of our top institutions with the global top.

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