Spotlight On Research

The higher technical education in India has been growing at quite a fast pace. But this growth has been restricted to undergraduate teaching. Research has not been a strong point—even for the established universities. In thousands of new institutions, it has become quite a challenge to encourage faculty to conduct research.

A common lament of academic leadership is that it is impossible to recruit quality faculty to carry out research. Here, the implication is that research can only be carried out by a faculty, who has done "solid" work before as a graduate. In technical fields, the number of people going through Master's degree is a fraction of the number of undergrads. The number of PhDs produced, is even less. Given these realities, it's not possible for institutions to find faculty who have done "solid" research as a graduate. If we give up on 90 percent of the faculty, it will be impossible to create a vibrant research ecosystem. Without such an ecosystem, we will continue to attract few students to graduate programmes. So, there has to be a way to encourage an average faculty member to conduct research. Let's start with the presumption that most faculty members have a potential to carry out research. Quality of research output will, of course, vary. Ideas may not be "publishable" in reputed journals and conferences, right from the first. But, academic institutions must encourage research, still. Why? Because, at all levels, institutions should encourage research as it enhances the understanding of our world. It helps develop techniques that create innovative technologies, products and services, or improve existing ones.

Then, there is the more mundane goal: by looking at a problem, we improve our understanding of the existing knowledge, making us a better teacher. If we have faculty, who are not well-prepared (as far as basic education and exposure to high-quality research is concerned) for creating new knowledge, we must still demand that they solve little problems in whatever area they are interested in. This quest is important in keeping a teacher up-to-date with changes in his field, and his ability to update curriculum periodically.

Analyse, Assess, Act

It is universally acknowledged that one of the major goal of research is to improve the quality of teaching. Having said that, it is then obvious that one cannot leave research only to the top universities. The challenge that needs to be overcome, is for the academic leadership to believe that their faculty, too, analyse, assess and act.

Institutions can express their "seriousness" by investing in their faculty, providing them with mentorship and removing hurdles on their path to research. There has to be a budget for each member to take care of all research-related expenses that cannot be charged to sponsored projects (in most cases, it takes time to get research grants from funding agencies). At the beginning, a member will need that extra bit of exposure. He or she will need to be encouraged to attend conferences, even though he or she may not have a paper to present.

The challenge in a conference or seminar is to define problems that should be solved. During presentations, it often happens that one thinks of some extension or improvement of an idea being presented.

Problem Solving

A faulty member should be asked to spend time at other institutes where research output is more. It could be a week or two (during summer or winter break) and expenses for such visits should be borne by institutions.

One should also invite researchers from other institutes, to visit, hold seminars and interact with faculty. These will provide mentoring to the faculty, and teach her better research tools and methodologies. Research infrastructure in all universities needs to be updated (read: better lab space and equipment, journals and faster internet. Initially, only a small amount of space could be provided, and only a limited set of equipment may be purchased. Only after the member has shown some promise, more investments may be made).

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In most disciplines, it is possible to start solving small problems with a limited infrastructure, which is needed for undergrad programmes in order for them to carry out their final year project. So, a major impediment is really a lack of confidence (in the faculty). Therefore, disinterest in spending even small amount for them.

In central government institutes, there is a guaranteed research support of ₹1 lakh per year for each faculty. This is a small incremental expense compared to what the institutes spend on pay and perks, and supporting members in terms of an office, PC, furniture and so on. But, it sends out a message that research is not only desirable, but is a necessary part of the duties of a faculty.

The next important input to research is manpower. In most institutes, the only manpower available is the set of undergrads. Therefore, one has to involve them in research. The best way to do that is to insist on quality final year projects. Currently, most institutes do not take these projects seriously. Students copy a report from the web, and there is no evaluation to find out their contributions. Most institutes would grade these projects liberally, so that in the university exams, students do not suffer (compared to those from other institutes). In my experience, top students in even the remote institution are quite capable. But, there has to be some incentive—given that marks are not an incentive enough. Establishing "best project awards" and promising to support their travel to conferences if they are able to publish a paper, will go a long way in encouraging students to do a good job in their final year project. At the same time, it should be made clear that copying of reports and unethical practices are not acceptable.

Research output must be given weight, while carrying out an annual review, and when salary hike is being negotiated. Also, those faculty who start producing research can now be mentored and supported to start looking at bigger research challenges. They can be encouraged to write proposals for funding agencies. In today's market, companies, too, are looking for supporting research at academic institutions. Faculty may be made aware of such opportunities. Alternatively, the faculty may be encouraged to join a PhD programme in a good research department, possibly as a part-time candidate. While the academic leadership in these small institutions should shoulder primary responsibility to encourage research by their faculty, the top institutions also have to do their bit to create a research ecosystem. They have to help weaker institutions around them, if they are hoping to get quality graduate students for their own programs. Therefore, institutes (IITs and IISc) should have summer internship programmes for students of these institutions, and can also allow them to spend a semester as a non-degree students—either to do a project or to do courses whose credits are transferred. EDU

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