Research Excellence in Higher Education: Major Challenges and Possible Enablers

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It is said that ‘A good teacher may not be a good researcher, but a good researcher is always a good teacher.’ It means research and education are twins. Education aims to acquire the skills and knowledge for building a more sustainable society. The Research enhances the continuous professional growth of teachers and provides the students with marketable skills. It leads to improvement in teaching and learning situations and also develops the scientific attitudes of objectivity, curiosity and critical outlook in the students. Quality life of the people of any country largely rest on the quality of education and research. Research in higher education has not been remained an untouched area for any nation, but it has a direct link with the upliftment of the society as a whole. The mission of higher education is to achieve access, quality and create a knowledge society/economy. Knowledge generated by research is the basis of sustainable social development. For this reason, understanding local and indigenous knowledge through research is of the greatest importance.

Quality and excellence in the higher education sector is one of the major initiatives of the Government of India in its plans. To achieve the outcome of enhanced quality at all levels of education, Govt. of India has been focusing its attention on quality and excellence of research in higher education. Therefore, Quality in teaching learning process, institutional environment, innovative practices and teacher improvement are becoming the foci of researchers, policy makers, and implementers. In all of this, higher education institutions play a
crucial role in developing research excellence. That research culture shapes our other core objectives of education provision and being a national and international policy resource. This paper presents the present scenario of research in higher education in India and also identifies the key challenges that India’s higher education sector is facing.

**Concept of Research Excellence**

Research is the orderly investigation of a subject matter for the purpose of adding to knowledge. An excellent research is a prerequisite to economic development in the knowledge society. It is the creation of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts, methodologies and understandings. The definition encompasses ‘creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of humanity, culture and society, and the use of this stock of knowledge to devise applications’ (ARC, 2008). Research excellence, however, is measured against past performance, making the two measures incompatible and leaving researchers wondering how best to proceed. It is not possible to draw up hard and fast rules about measuring the quality of research, but there should be evidence of some of the following:

- publication in particularly prestigious journals or by leading publishing houses;
- competitive grant winning, especially as Principal Investigator;
- work that has inspired others and affected the research agenda;
- work of outstanding originality;
- authorship of definitive textbooks;
- external recognition of research quality; and
- the influence and value of research undertaken.
These are the main indicators of excellence in research. It is systematic, critical and self-critical enquiry which aims to contribute towards the advancement of knowledge and wisdom. Therefore, it is very hard to achieve excellence in any field without excellence in research.

Status of Research in Higher Education

Indian higher education system has undergone massive expansion in post-independent India with a national resolve to establish several Universities, Technical Institutes, Research Institutions and Professional/ Non-professional Colleges all over the country to generate and disseminate knowledge. In recent decades institutions of higher education have increasingly emphasized research, with faculty being promoted and rewarded more and more on the basis of research. A well managed and progressive education system rests on the work of able researchers and their vision. Today, India's higher education system is the world's third largest in terms of students, next to China and the United States. India educates approximately 12 percent of its youth in higher education as compared to 20 percent in China and 91 percent to South Korea.

Universities and its constituent colleges are the main institutes of higher education in India. According to UGC, there are 677 universities in India. In which, 43 central universities, 130 deemed universities, 154 private universities and 295 are state universities. According to the Department of Higher Education Government of India, more than 35,000 colleges are functioning under these universities and institutions with around 17 million students. Traditionally, these institutions assumed that Quality could be determined by their internal resources, viz., faculty with an impressive set of degrees and experience detailed at the end of the institute’s admission brochure, number of books and journals in the library, well-equipped laboratories, indoor and outdoor playgrounds, an ultra-modern campus, and size of the endowment, etc., or by its definable and assessable
outputs, viz., efficient use of resources, producing uniquely educated, highly satisfied and employable graduates.

Some institutions of India, such as the Indian Institutes of technology (IITs) & Indian Institutes of technology (IIMs), have been globally acclaimed for their standard of education. However, the overall scenario of higher education in India does not match with the global Quality standards. According to the London Times Higher Education World University Rankings powered by Thomson Reuters (2012-13), no Indian university features among the first 100. But universities in East Asia have been included in the first hundred. Hong Kong has two, ranked at 35 and 65; Singapore two ranked at 29 and 86 and South Korea three ranked at 50, 59 and 68th position. Notably, China's Peking University and Tsinghua University are ranked at 46 and 52 respectively. There is no Indian university in the rankings from 100 to 200. It is when one moves on to the next 100 that we find only two Institutes namely Indian Institute of Technology, Kharagpur and Bombay.

As mentioned by the Prime Minister Manmohan Singh (2007) “Our university system is, in many parts, in a state of disrepair...In almost half the districts in the country, higher education enrollments are abysmally low, almost two-third of our universities and 90 per cent of our colleges are rated as below average on quality parameters.” Universities for Research & Innovation Bill 2012, which envisages setting up of universities of excellence is pending in the parliament. Kothari Commission had recommended that government should spend at least 6% of its gross domestic product (GDP) on education. However, in over 45 years, we have been able to achieve only half the target. The Knowledge Commission additionally recommends an increase of at least 1.5% of GDP for higher education out of a total of at least 6% of GDP for education overall. Currently, the Government spends around 3.8% of its GDP on education. While only 1.5% of GDP is being allotted in yearly budget for higher education and
0.81% of GDP expends on research & development in the field of Science & Technology as compared to 2.6% in the USA, 1.23% in China and almost 3% in South Korea. There are insufficient levels of meaningful industry participation in aspects like curriculum development, research and faculty exchange programmes in India. There is inadequate focus on research in higher education institutes. The causes include insufficient resources and facilities, as well as, limited numbers of quality faculty to advice students. According to the data (2009), enrolment for Ph.D./M.Phil. constitutes only 0.48% of enrolment in higher education in India.

The UGC report (2012), ‘Higher Education in India at a Glance’ prepared by the Chairman, Ved Praksah and other senior UGC members, states On the much debatable topic of research, the report paints a dismal picture stating that the student enrollment in this area is not encouraging. Talking about enrolment by stages, the report says that 86 per cent students complete their Graduation, while only 12 percent opt for Post-Graduate programmes and only 1 percent opts for research thus making it clear that the students either do not have zeal for pursuing post graduation and research. In the areas of publication and citations, India’s performance is very poor. According to a study, 32.5% contribution of published research papers is of USA researchers in the world while only 2.5% contribution of the global output is Indian scholars and they have always been under criticism for not being innovative, original and of high quality.

At present, the world-class institutions in India are mainly limited. Most of the Indian colleges and universities lack in high-end research facilities. Under-investment in libraries, information technology, laboratories and classrooms makes it very difficult to provide top quality instruction or engage in cutting-edge research. Of the four Indians to win the Nobel Prize in science, only one, C V Raman, was awarded for research work done in his own country. Using the Science Citation Index of the Institute for Scientific Information, Virk (2009) cited a survey which placed India in 8th place in the top 20 countries undertaking
scientific research in the 1980s. In the 1990s, we were down to the 12th position, and today India is no longer in the list of the top 20. India ranks 21st in terms of output of research papers in science, but stands 119th in terms of research papers of any worthwhile contribution. The number of R&D scientists and engineers per million of the population is 157 in India. This is one fifth the ratio in South Korea, and one thirtieth the ratio of countries like the USA and Japan. We have 17 per cent of the global population but account for a mere 1.5 per cent of the global output in Research & Development. Not surprisingly, therefore, there is a serious and growing concern in India about the quality of doctoral education in India. Indian universities also perform very poorly in research training, with just 17,000 PhDs in all subjects in 2012. And the quality of most PhD theses, especially in the social sciences, is widely regarded as unacceptable.

Keeping in view the above mentioned points, the time has come to create excellence in the fields of education, research and capacity building. To achieve excellence mainly in teaching and inculcate the research culture, UGC has initiated the scheme of ‘Colleges with Potential for Excellence’ (CPE). It has been assisting identified Universities for granting the status of ‘University with Potential for Excellence’. In recent years, numerous attempts have been made to tackle these problems. The UGC’s Special Assistance Program for research has been greatly expanded, providing more realistic amounts of funds to selected well established academic fields in specific programs. There are also moves to establish a system of performance measures around indicators such as degree completion, publication counts and quality. We are investing heavily in internet connectivity in an effort to improve access to global information resources. Various attempts are also being made to set research priorities, and encourage the sharing of infrastructure through partnerships with corporations and universities abroad.
Keeping in mind quality research, a scheme of ‘Strengthening of Basic Science Research in State Universities and Colleges’ was also launched during 11th Five Year Plan, concentrating on production of high quality Ph.Ds and nurturing of research ambience through strengthening of infrastructure, provision of Research Fellowships and Post-Doctoral Research Fellowships. The FIST (DST), SAP (UGC) and COE (DBT) are providing grants to departments to improve their research competitiveness. At present NAAC is assessing and accrediting teaching and research departments within Universities/Colleges.

The demand for high quality researchers will require expansion of postgraduate research and PhDs in Indian institutions of higher learning. Generally, although not always, independently of its universities, India has evolved quite a large number of high quality research institutions well positioned, because of their excellence, field of expertise, or both, to provide vital advice to policy-makers. And India’s recent governments have been energetic and self-confident in seeking out such advice, elements of which sometimes then shape or form the core of legislation or new regulatory approaches, including the establishment of national standards. But, the overall contribution of Indian researches being carried out at higher education institutions are not that much good in terms of quality. Keeping in view of the excellent achievements of the university in particular fields, ‘Centres for Excellence’ have been sanctioned to different universities by the UGC to provide meritorious education in line with the new developments and challenges. Hence, it is a high time to identify major problems & challenges concerning the deterioration of the research and quality of researches being carried out at higher education in India.

Major Problems and Challenges in Research Excellence in Higher education

In present scenario, this is one of the major challenges in hampering the quality of higher education in India. Higher education, especially attaining
doctoral degrees, throughout academic institutions across the globe, has been in high demand and more private institutions are getting into this arena to fill the pressing need. As such, understanding the needs of higher education institutions and current doctoral students has become especially important for success in the new millennium. There are many basic problems which deteriorate the quality of research at higher education in India today. These include inadequate infrastructure and facilities, untrained human resources, funding or financial crunches, large vacancies in faculty positions and poor faculty thereof, low student enrolment rate, outmoded teaching methods, declining research standards, unmotivated students and overcrowded classrooms. There is an inadequate and diminishing financial support for higher education from the government and from society. Research in higher education institutions is at its lowest ebb. There are very little incentives for researchers in India to publish their work in reputed journals that are double-blinded.

The emerging trends and challenges are intended to provide fresh insights both for policy-makers and the higher education community alike, as they address the main challenges facing research systems in a globalized world. Consequently, countries across all regions worldwide are facing increased demand to strengthen their capacities for research and knowledge production. A few institutions of higher education in the country are excellent in the sense that their infrastructure, resources, faculty, programmes of teaching and research are almost as good as the best in the advanced countries. But, the same cannot be said of the average institutions of higher education in the country. They do not come anywhere near the level of average institutions of higher education in the advanced countries. This vast gap in standards and facilities has been a cause of constant anxiety and concern to the policy planners of higher education in India. Ensuring equitable access to quality higher education for students coming from poor families is a major challenge. Students from poor background are put to further disadvantage
since they are not academically prepared to crack highly competitive entrance examinations that have bias towards urban elite and rich students having access to private tuitions and coaching.

Some of the leading challenges before the higher education system are continuous upgradation of curriculum to keep in pace with rapid growth of science and technology; globalisation and the resultant challenges from the international universities; grooming of many private institutions without any method of ensuring maintenance of quality and standard; need for adequate funding to meet the demands of various novel innovative programmes; developing a meaningful and purposeful inter-face between the universities, national research laboratories, industries, government and society, etc. ICT in higher education policy may not be able to completely overcome all these challenges though it may play a role in information and resource sharing. Statistics show that there is a huge gap between the demand and supply. According to the recent report of HRD ministry, presently about 12.4 percent of students go for higher education from the country. If India were to increase that figure of 12.4% to 30% GER (gross enrolment ratio) by 2020, then it would need another 1500 universities and over 45,000 colleges in the next 10 years. The HRD ministry says that the foreign institutions could fill this gap to a large extent.

Today, there is a gross shortage of equipment for experimental research, especially in higher education. The standards of academic research are low and declining in India in comparison to other developed countries. The major part of research work done in India is from IITs, NITs, IISC, and IIMs. Research and higher education are complementary to each other. Higher education is also necessary to meet demands that are not in the domain of the market, such as pure research in sciences, social sciences, and humanities. Academic institutes in India have few inter-linkages amongst themselves or with industry.
According to a recent report of HRD Ministry premier educational institutes like the Indian Institute of Technology (IITs) and the Indian Institute of Management (IIMs) are facing a faculty crunch with nearly one-third of the posts vacant. The scarcity of quality teachers in universities and colleges is another issue which hampers the novice researchers undertaking quality research in India. India lags behind China in spending on research and development work as well as number of scientific researchers, Science and Technology. The number of core researchers in India was about 1.5 lakh as compared to China’s 8-10 lakh. According to the available official statistics, the expenditure on R&D in the field of Science & Technology as a percentage of gross domestic product (GDP) was 0.81% during the year 2007 in India. For perspective, countries spending the most on S&T as a percent of their GDP were Israel (5.11%), Japan (3.45%), South Korea (2.95%), the United States (2.79%) and china (1.23%) have spent more than India.

Problems surrounding the coordination of research efforts in India have also been widely noted. Moreover, India’s higher education institutions are poorly connected to research centers. The productivity is quite disappointing and discouraging. So, this is another area of challenge to improve the quality of research in higher education in India. Viewing these points, it can be said that there are some problems and challenges to be cured through timely for the improvement of research quality in higher education in India.

**Possible Enablers for Research Excellence in Higher Education**

The country needs skilled and trained faculty and researchers for making India superpower in the world. For this, there are some possible enablers for improving research excellence in higher education:

1. *Towards a Learning Society*- As we move towards a learning society, a philosophy of national development must be evolved and everything must
be done to give appropriate legal backing to bodies concerned with research and research-related activities.

2. **Industry and Academia Connection**- Industry and Academia connect necessary to ensure curriculum and skills in line with requirements. Skill building is really very crucial to ensure employability of academia to understand and make sure good jobs. Policies of higher education should be designed to strengthen indigenous research agenda. We should be optimistic that private-public partnership and the industry interface will take place in the field of research in higher education.

3. **Incentives to Teachers and Researchers**- Industry and students are expecting specialized courses to be offered so that they get the latest and best in education and they are also industry ready and employable. Incentives should be provided to teachers and researchers to make these professions more attractive for the younger generation. Bright scholars and researchers require motivation and right attitude to carry on their work.

4. **Professionally dedicated Faculty**- Lack of focus on R&D is undoubtedly one of the most important causes of insufficient achievement levels in India. There is no short cut to being a successful researcher – like success in anything else; it requires dedication, sharp focus, and hard work. It is important to faculty members, that they have many more responsibilities and commitments— teaching, serving on various committees within the Institute and outside, interaction with students and external people, etc. So faculty members should manage time well in teaching and research related tasks, discussing in committees and meetings, interacting with students and others.

5. **Regular Monitoring And Evaluation**- There should be regular monitoring and evaluation of teaching and research in the universities and other institutions of higher learning. A monitoring & evaluation (M & E) unit
should be set-up at State level preferably attached to Chancellor’s office; and for its effective functioning, a statistical cell should be set-up in each University in the State, under the overall supervision of the M & E Unit.

6. High pay scale to Research Scholars- The Vice Chancellors of universities should be provided with enough flexibility to fix the pay scale of these researches and scholars. Change should be made in the education system from the primary level (reduce work load, put more importance on physical activities, encourage original thinking etc). Fast track sanction of funds for research in newer areas. For this, both the UGC and the NAAC should play useful roles in this initiative.

7. Innovative Research Practices- The new technologies offer vast opportunities for progress in all walks of life. Though efforts are required to improve the country’s innovative capacity, yet the efforts should be to build on the existing strengths in light of new understanding of the research-innovation-growth linkage. Innovative practices related to examination reforms should be empirically tested and institutionalized. Working facilities and workload of teachers should be as per the international norms. Teachers should be encouraged to attend various Conventions, Conferences, Seminars, Workshops in their disciplines to update their subject know how.

8. To mobilize Resources- Effective measures are vast important to mobilize resources for higher education. Knowledge, which is at the heart of higher education, is a crucial resource in the development of democracy, social justice and progress towards individual enlightenment. There should be to enhance infrastructural facilities to utilize the output of research for the development of the nation and society.

9. ICT-based Research Management- There is a need to develop a new breed of ICT-based research management system for the universities
which includes both academic and financial management, providing a unified data base and analytical interface for searching, reporting and evaluating the university performance in research. These research activities are backed up by adequate infrastructure, adequate personnel and adequate funding.

10. **Public Private Partnership**- Public Private Partnership (PPP) is most essential to bring in quality in the higher education system. University Grants Commission and Ministry of HRD should play a major role in developing a purposeful interface between the Universities, Industries and National Research Laboratories (NRLs) as a step towards PPP. Funding to NRLs by the government should ensure the involvement of institutions of higher education engaged in research activities. Such efforts need a very serious structuring for the research base institutions.

11. **International Cooperation**- Government should encourage foreign universities to come to India to set up independent operations or collaborate with existing Indian Institutions. Universities in India have been a primary conduit for the advancement and transmission of knowledge through traditional functions such as research, innovation, teaching, human resource development, and continuing education. International cooperation is gaining importance as yet another function. Intellectual Property Rights (IPR) norms for International Research collaborations with Indian and foreign institutions as well as university achievements need to be developed.

12. **Publication cum Citation System**- A national publication cum citation system for arts, humanities, sciences, social sciences, management and languages may be evolved which could be country specific. To enhance the quality of research work, and research papers, peer-review process
should be strict & all the papers should be carefully assessed before acceptance for publication.

13. **Action Plan for Improving Quality**- Academic and administrative audit should be conducted once in three years in colleges by external experts for ensuring quality in all aspects of academic activities. There should be better collaboration and coordination between government and research institutions. The approach of doctoral research needs to be more analytical and comparative and be related to society, policy and economy. For example, periodically once in a month they should sit together and think over their aims.

14. **World Class Education**- Indian government is not giving priority to the development of Standard in education. India should aspire for the international standard in education. To achieve that goal it should adopt uniform international syllabus in its educational institutions. In order to improve the areas of research, it is necessary to upgrade laboratories, motivate researchers and provide research funding. International collaboration of research must be promoted and the researchers must be released from undue restrictions on international travel.

15. **Research Fellowships for Ph.D. Students**- In order to attract more students to join Ph.D. programs at various universities and colleges, the numbers and quantum of JRF and SRF needs major revision, especially in view of the fact that other professions provide much more lucrative salaries and perks. Meritorious doctoral students should be recognized through teaching assistantships with stipends over and above the research fellowships. It is suggested that JRF should be increased to Rs.20,000 and SRF to Rs. 30,000/month. The NET (CSIR/UGC) and equivalent tests need to be re-vamped to ensure quality of those selected for JRF/SRF and thus for Ph.D.
16. **To Increase Quantity of Universities and Colleges** - We need more universities because we are more in number and present number of universities is too less. More universities must come up from central government and the existing universities must be developed. NKC has recommended setting up of 1500 more universities and 45000 more colleges with adequate research facilities by the end of the year 2015 in order to compete in the global market. It has also called for establishing an Independent Regulatory Authority for Higher Education (IRAHE) to monitor the quality of overall higher education in India.

17. **High-Tech Libraries** - Our university libraries have a very good collection of books, but they are all in mess. Indian universities should concentrate more on providing quality education and excellent library facilities which is comparable to that of international standards. Libraries should be fully equipped with the latest books, journals and periodicals. A library must be online and conducive for serious study. Make available high quality e-text books, e-reference books, e-research papers and e-content in different languages free of cost to genuine learners.

18. **Well Equipped Laboratories** - Well equipped Laboratories should be updated and obsolescence in equipment/facilities should be removed on a regular basis. There is great need for providing broad band connectivity to all students along with low priced computer accessibility. Good salary packages and benefits to the researchers so that good brains can be attracted to this profession for research excellence.

19. **Refresher Courses Need to be Strengthened Existing Faculty** - Besides expanding and revamping the UGC’s Academic Staff Colleges, more pro-active “hands-on” training in laboratory methods in different emerging areas needs to be provided to the faculty across the country. Every year, there must be at least 200 training courses, of 3-4 weeks duration, at
established centres (research institutes and university departments). These centres will also serve as training place by regularly offering specialized short term programmes to familiarize young researchers with modern research technologies.

20. **Multi-disciplinary Mission mode Research and Innovation Programmes** - Multi-disciplinary mission mode research and innovation programmes should be evolved in association with arts, humanities and social sciences which should directly benefit the society. In order to achieve this, every University should allocate a certain proportion of their annual budget as an earmarked budget for research and innovation. The UGC, ICSSR and other research funding bodies should encourage inter/multi-disciplinary Seminars/ Conferences/ Research projects.

**Conclusion**

At present, we are moving towards problem-focused teaching and research. The proper environment for research is not yet available in India. Creating a conducive environment is needed for growth and utilization of research. For this to happen, many things have to be considered. These include adequate infrastructure, latest technology, skilled and trained manpower, institutional capacity, international standard and adequate financial support etc. It also involves motivating the entire population to adopt a science culture as a pattern of life. Indian universities need to be dynamic and adaptive to the changing needs and priorities of the society and should provide an arena of freedom to young innovative minds. Good researchers working on good projects should be provided with public fund to support them as well as the national knowledge network should be made available to these researchers for research excellence in higher education in India. If the provisions expected to be made in the 12th five year plan (2012-17) get the grounds, the higher education institutions would surely benefit and can have an edge to contribute the quality
research for citizens of the country. Improving the quality of research at higher education in India, we have to identify some issues responsible for the quality deterioration and implement the remedies to achieve our goal. Now, the journey towards excellence in higher education has begun and we are on the right track but there's still a long way to go.

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This article is published in the University News in 51(32), August 12-18, 2013.

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