

## 4. RESEARCH CULTURE IN EDUCATIONAL INSTITUTIONS: CHANGE FOR BETTER

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The System of Ph.D. education is a matter of concern for most of the Universities in India and abroad. Universities are expected to do meaningful, application oriented research that will indirectly enhance the quality of Teaching-Learning process at UG/PG Level, also. Our traditional education is a process of cloning that trains students to do what their Mentors do. Our traditional research methodology is 'text book oriented' and it hardly bothers about 'application' and benefits of research to the society, at large.

### What is Research?

Basically research means going deeper into the process of 'looking' for something. It also helps in sharpening one's senses and improving alertness; in addition to expanding awareness about futuristic needs. Research also means living and growing with questions. One has to always ask why it is like that? What is the principal involved in any Physical or Chemical action / reaction? If some problem exists, 'how' it can be resolved with socio-economic criteria taken into account? Research is an active, diligent and systematic process of enquiry in order to discover, interpret or revise facts, events, behavior or theories or to make practical application with the help of such facts, laws or theories.

Basic research (fundamental research / pure research) deals with advancement to knowledge and theoretical understanding of

relation among different variables. This type of research is exploratory and driven by researcher's curiosity. Basic research provides solid foundation for further and applied research. In this case, there may not be any guarantee of short term and practical gains.

Whereas, applied research solves specific practical problems, it is always done on the basis of basic research. Industrial institutions, National R & D Laboratories, defence or space Laboratories are mostly involved in Applied Research. Unfortunately, very few Universities show concern for applied, practical problem oriented research. Electronics, Communication, Informatics, Process or System Engineering, Environmental Science, Applied Science, Applied arts are common areas of this type of research activities.

If doctoral research is to remain viable in 21<sup>st</sup> Century, Universities must tear down the walls that separate fields, and establish programmes that encourage inter-disciplinary investigation and collaboration. Curricula Design must focus on solving practical problems that are related to society, in and around. Unfortunately, faculty members all too often remain committed to traditional approach and the frame work of rules, regulations and statutes of the University, does not allow the radical changes, so easily and quickly. There is a need to create premise for reforms from all stake holders – students, administrators, academic & governing bodies and even people

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from public. The difficulties are systemic and therefore, must be addressed comprehensively and cooperatively. University prestige is measured both within and outside the institutions, by both quantity and quality of Ph.D. thesis, department's doctoral programmes. For this, one need to eliminate programmes that are inadequate or redundant. To facilitate change, Universities should move away from excessive competition fuelled by pernicious rating systems, and develop structure and procedures that foster cooperation. One should encourage sharing of faculty members, students and resources .

India produced around 5900 science, technology and engineering Ph.D. in 2004. This number has now grown to some 8900 a years. The Central Government is making major investment in research and higher education. The hope is that up to 20,000 Ph.D.'s will graduate each year by 2020! But there is little incentive to continue in to a lengthy Ph.D. programme and only around 1% of under graduates currently do so. Students don't think of Ph.D.'s now, not even masters, a bachelor's is good enough to get a job especially in professional field (Sector).

However, in Universities, Ph.D. is a must for promotion and therefore teachers are lined up for Doctoral admissions. This demand and supply criteria has diluted the standards of Ph.D. thesis work. It is presumed that once you get admission to Ph.D. programme and register, you are sure to get the degree! There is no compulsion for publishing papers in standard international Journals and evaluation process in some institutions is not strict.

Collaborative/sponsored Research, Industry-University Interaction is very poor with few exception at Institution of Higher Learning (Like IIT'S, II Sc etc). In fact, there is lot of funding available for Minor/Major Research Projects from Department of Science and Technology, Council of Scientific & Industrial Research, Department of Space (ISRO)

Defence Research Development Organization, UGC, AICTE etc. There are many unsolved/ to be solved practical problems with these organizations and Industries which can be capitalized by the Professors and Research Scholars. But unfortunately, this does not happen and Academicians are unable to accept the challenge of futuristic LIVE Problems/ Projects. Students/Research Scholars are also interested in easy going problems with quick result so that they can 'some how' manage to get the degree with minimum efforts and minimum time period. This easy-going attitude has really killed the potential for quality research which can show its impact at International level. This is perhaps the reason that, even after six decades of independence, India could not bag a single Nobel prize. There are few patents and some pockets of excellence here and there, no doubt; but over all impact of our fundamental research contribution is not worth mentioning. Most of our technology contribution in the field of Missiles, Satellite, Space or Communication technology is in the Design and Development category and hardly counts for Basic Research category. We still lack in basic component Design, fabrication, basic high level instrumentation and equipment production, for which we are largely dependent on import. It is very difficult for University to set up State of the Art Laboratory with sophisticated costly equipments and funding from State/Central Government for this purpose is very poor.

Institutions that have had a long and reasonably good academic culture of research and innovations too have been facing serious procedural problems such as lack of administrative support, delay in clearance of research projects, timely release of funds and insufficient monitoring of research needs. Most of our Universities need to strengthen the support to encourage successful patenting as well as innovation in teaching and research. We need to identify the motivating factors to enhance research activities in the Universities.

We must enhance the participation of large