

**INTEGRATION OF RESEARCH AND INNOVATION IN HIGHER EDUCATION:
A CONTEMPORARY APPROACH FOR QUALITY OF EDUCATION**

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Research is an integral part of the higher education system. The students are being exposed to project method of learning in Professional as well as graduation courses. Universities are imparting the Research and Innovation to ensure the Quality research. Research ethics has become forefront to avoid plagiarism in higher education institutions. The fruits of research are being carried to the Industries through collaboration. In higher education institutions abroad they will sponsor the Research projects fully or partially. The idea behind these Research projects is to carry the outcomes to the Industry.

Research appeals for the solving the challenging tasks in various sectors ranging from Science and Technology to Industry. Research and innovation will address societal challenges and be associated with the values, needs and expectations of the society in general. This paper studies the objectives, methods to integrate the Research and Innovation in higher education. Besides it studies the importance of Research in Contemporary world to enhance the quality of education.

Key words: Research, Innovation, Student Projects, Learning, Higher Education, Knowledge Economy

Introduction

From the post-independent times the education system is encouraging prescribed books and rote learning. The examinations are testing memory rather than analysis and creativity. When the students enter into the stage of research they encounter the problem of lack of analysis and spirit of enquiry in the exploration of innovative areas. The intellectual stimulation should happen at the earlier stages of education system.

Research plays an important role in the economic development of a country. In academic research there is an increasing need for new developments and innovation. There is a call for Government support for Research and Innovation. Research and development have pivotal role for future competitiveness of the economy. This paper attempt to discuss the concepts of Research and Innovation and the challenges to integrate them into higher education.

Research and Innovation occupies a vital role in the higher education to bring about a change in advancement of societies and economies. They foster economic development and also strengthen the technological progress. In this era of digitization without enough knowledge in Research skills the higher education becomes inadequate and does not suit the needs of the modern job market. The Big data analytics has opened a huge demand for students in the employment scenario. During the Pandemic, Research has played a major role in eradicating the virus and besides knowing the efficacy of the Vaccines. There by Higher education Institutes comes into the central picture in enabling the students towards the progressive outcomes of education.

Objectives

- To know about the importance of Research and Innovation in higher education
- To understand the integration of Research in higher education.
- To determine the policy framework to integrate the Research in higher education.

There is a paradigm shift in Higher education in recent times on account of choice based credit system. Students are allowed to take up any combination of their choice. Besides they are allowed to do double degree simultaneously. In terms of numbers it has grown enormously in last ten years. The quality of education can only be enhanced when there is strict adoption of student-teacher ratio. In the time of pandemic, lot of changes came in education particularly higher education

due to efforts of higher education authorities. MOOCS is a big shift towards flexibility in higher education. Otherwise non-available degrees are available to aspirants.

The GER at the higher education improved to 27.1 percent in 2019-20 from 26.3 in 2018-19. The enrolment in higher education is 38.5 million in absolute figures in the age group of 18-23 years. Even though it has increased in percentage terms by 1.1 percent still 72.9 percent do not access to higher education. This gap needs to be filled by the government intervention.

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The word Research which is creative and having intellectual property developed in a systematic manner and increases the vast reserve of knowledge both individually and institutionally is imperative in higher education. The Research in higher education apart from Research institutes and Universities is in initial stages and requires a boost to integrate in the knowledge economy. The impact of research on Society and existing Knowledge is the basis for funding and Institutional promotion of Research. The findings and fruits of Research should solve the impending problems of the society. The research in standard, methodical, logical and scientific manner should be reinvigorated to fill the Research gaps in the economy. Pandemic is a prevailing example of the significance of Research in the scientific field. If the Research is introduced in higher education it may open new avenues for number of discoveries and thereby lead to numerous innovations in the STEM courses. Lack of training in Research especially in Methodology is the constraint in the Research arena.

The primary challenge of any country is to enhance the skilled manpower to increase the socio-economic development of a country. The growth of Universities, Professional Institutions, Technical Institutions, Research Laboratories and Colleges in terms of numbers are impressive. Indian is now having to its credit highly developed higher education system that deals with all aspects of human creation and intellectual capacities including recent developments of Artificial intelligence and Block chain technology. But the challenge here is the way to integrate the Research and Innovation into the higher education system though specialised Research laboratories are established in all the arenas.

The higher education in India is facing many challenges due to slow evolution in the higher education process. It is lacking in investment in research to work with the human resources by integrating the conventional disciplines of Natural and Physical sciences with social sciences and Humanities. The inter-disciplinary research is promoted in recent times through sponsored and collaborative projects. Their joint efforts in the knowledge economy develops essential skills and suitable approaches.

The basic problems in Indian higher education arena is that of inadequate Research facilities in Scientific Laboratories and less allocation for Research and development when compared to their counterparts in other countries.

Rethinking Quantity Vs. Quality

The Student-teacher ratio as proposed by UGC, AICTE are not followed by the Academia due to shortage in permanent faculty and delay in Recruitment policies. There is more of outsourcing and part-time faculty in Universities and Colleges. Recruitment of faculty is seldom dependent on enrollment of students. The recent policies of Institutional authorities enhanced the seats in higher education. The learners desire about the National Institutes such as IITs, NITs for higher education due to infrastructural facilities. One more question is extensive vs. intensive education. There are differences in reach of education within geographical regions in the country.

The top Research Institutions such as ICMR, ICSSR, ICAR, CSIR and TIFR are engaged in quality research in the recent times in the fields of STEM and Humanities.

The framework needed for the life-cycle of innovation from beginning to end is still evolving. The Public funding approach may be more suitable for the future. Ratio of Researcher per million population is 119 as against 5287 in Japan and 4484 in United States. Indian Colleges and Universities lack sophisticated research facilities when compared to advanced countries.

Research as the interesting area for association between Academic and Corporate world. It provides a systematic and theoretical framework to enable reassessment and enhancement of current level of knowledge and understanding. Moreover, the Research enables the faculty to gain deeper knowledge and to impart curiosity among the students to take up further research.

India has a low base of researchers in scientific and academic field. This is one of the reason being the Government taking steps to encourage research. But most Post graduates are looking for employment rather than research as the former is more economically productive as per the awareness and understanding. In order to enhance more Public-Private partnership and Industry-Academia collaborations and sponsorship of the students in the Research Laboratories by the Government and Corporate Sector are necessary. The quality of research apart from the traditional educational system to be enhanced.

Culture of Innovation

The drivers of innovation and entrepreneurship skills encouraged through Institutional Innovation centres, Start-up India, ATAL Yojana and must also take the support from New Education Policy proposed by Government recently. The four years of graduation imbued with innovative and research skills is still evolving. The European teaching styles of SCL and PBL should be integrated in teaching to enhance the analytical abilities of the students at under-graduation level. Student diversification is the main factor for introducing new methods of teaching in place of traditional model of teaching. The adaptations of the new and innovative teaching methods like blended model are based on student-centric methods.

Diagram 1: Policy Framework for Research in Higher Education

Environment	Stake Holders	Policy Support for Research
Micro	<ol style="list-style-type: none"> 1. Student 2. Teacher 	Institutional level Policy
Meso	College/ Institution/ University	<ol style="list-style-type: none"> 1. Government Policy Support 2. Corporate Support 3. Funding Support
Macro	<ol style="list-style-type: none"> 1. Government 2. Corporate 3. Funding Agencies 	National and International Research Policies

Impact	1. On Society 2. On Future Research 3. On Academics	Research Outcomes

In the micro environment stake holders Teachers and Students are influenced by the Governmental support or Institutional support and policy for research. The second level Meso environment is influenced by the Governmental Policies, Corporate funding and specialised funding agencies policies on research as shown in the diagram 1. The third level Macro environment – Government, Corporates and funding agencies are influenced by the National and International Research Policies.

Collaborative Research

The exploration of possibilities of funding for Research is one of the primary requirement of India. In western countries, funding is provided by the Industry. The Industry-Academia partnerships are not taking the shape in India in spite of meagre percentage. The Government should make it compulsory to earmark Research by the Corporates and channelize it towards the Academia. Moreover, ready job is more compliant to an young Post graduate rather than research. The Government has taken steps in the form of National level funding agencies like Department of Biotechnology (DBT), Department of Science and Technology (DST), University Grants Commission (UGC), Indian Council of Agricultural Research (ICAR), Science and Engineering Research Board (SERB), Indian Council of Medical Research (ICMR). The Linkages of Public-Private partnerships should be encouraged.

In the era of knowledge society, there is a need for innovation and quality in research in higher education. The Industry-Academia should form the base for research and beneficiary to the society as well. Research powered by innovations is the key for higher education system. The current efforts are significant but needs a boost from the government policy. Not only the Society but also Industry benefits from the Research. Government should make efforts to link the Industry with Academia in India on par with the advanced countries where the Industry will sponsor Research projects in Academia. There should be frequent exchange of ideas between the Industry and Academia. The research in higher education should also encourage this partnership.

Conclusion

The Internships can also partnered on the basis of research in the required fields of importance. Skills in higher education through skill institutes also should improve the Research and Innovation. The IICs in higher education institutes are doing much service in this field. The cost of Academic Research should be affordable in STEM as well as Humanities. The Relevance of research should be given importance rather than nominal role in disbursing funds for research. The Innovation ecosystem in higher education can be increased through reducing teaching hours and enhancing infrastructure facilities in HEIs. The research methodologies relevant to the student level projects to be made aware in the respective fields. Starting from the high school to higher education the Research mind set needs to be strengthened which can be done with changes in the methodologies.

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