

# Chapter 4

## Sustainability in Higher Education through Basic Science Research: Strategies for Corporate Bodies in Pharmaceuticals

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### **ABSTRACT**

*Basic research in Universities is essential for a sustainable development. Recent developments in higher education have seen the inclusion of curriculum redesigned to serve the concept of developing young minds in the interpretation, execution, and use of basic science research. The challenge for educators is to “demystify” research and teach in ways that are professionally meaningful as well as intellectually acceptable. The objective of this chapter is to bring in various case studies to prove the essentiality of basic research in higher education with specific concern over pharmaceutical industrial growth plans. Data on R&D in higher education can be broken down by field of science (natural sciences, engineering, medical sciences, agricultural sciences, social sciences, and humanities), by type of costs (current expenditures, capital expenditures), and by source of funds (business enterprise, government, higher education, private non-profit, and funds from abroad). Measures of R&D performance in the higher education sector are often estimated by national authorities, and evaluation methods are periodically revised. It is necessary to review the design and conduct of higher education R&D surveys to improve the comparability of these indicators.*

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## **INTRODUCTION**

Especially in the field of Pharmaceuticals, there are perceptions that the pace of new drug development has slowed down and the pharmaceutical industries with high profit have sparked concerns of the future drug development. Pharmaceutical manufacturing lags far behind the manufacturing techniques of the 21st Century and the science required to transform a new discovery to a marketable new drug has definitely not kept pace with advances on the drug discovery side. This is mainly attributed to lack of basic scientific research training. Universities like Birla Institute of Technology & Science, Pilani have taken initiatives way back in 1970s to involve corporate leaders in their curriculum design and implementation.

The present chapter would include various strategic thoughts and implementation plans based on various university initiatives and some ideas on executive development programs in the areas of pharmaceutical education.

This book chapter would raise question among the readers to what the mission and value of basic research in higher education means in the field of pharmaceutical sciences and how corporates could get an impact or value-addition in the light of changing biomedical research and healthcare environments globally. The questions, and the views presented in this chapter are intended to promote discussion among all of the many stakeholders in pharmacy education. In the history of education, contribution by various eminent including Prof. Schroff in the harmonisation of pharmacy education in the global arena is worth mentioning. Prof. Schroff on the call of Pundit Madan Mohan Malavya, the then Vice-Chancellor of the prestigious Banaras Hindu University started the regular B.Pharm course of three years duration in the year 1937. These graduates were expected to be efficient in quality control and standardization of drugs for pharmaceutical industries. Consistent

with the changing society and development of health care system, there is an incessant redesigning of the quality of undergraduate-level courses (Commission to Implement Change in Pharmaceutical Education, 1993). In the year 1944, Dr. Khem Singh Grewal introduced pharmacology as a subject in the curriculum and a mandatory three months. Since then the pharmacy education is making progressive strides in India. Pharmacy education is in the cross roads of chemistry and biology and now integrated with information technology. Later on research dimension is also added constituting an important instrument for the creation of new knowledge.

From handful of 50 degree institutions 50 years ago, we now have more 300 degree colleges training more than 10-20 thousands of students. The number of M.Pharm and Ph. D. aspirants has also quite significantly increased in the past 2 decades. Although, graduate education and research programs have made significant contributions to the profession of pharmacy, to science, and to society, changes in today's research, education, and health care environments are stimulating the need for evaluation of whether some of these programs have outlived their usefulness. To understand the effectiveness of our need to revolutionize higher education in India, we need to understand the current status and changing scenario with regard to industrial expectations.

In various nature India forums the problems of basic science research in India has been discussed and debated and the root problem has been indicated to the basic science education system in India. With regard to the courses in pharmacy, these are not well defined and mostly directed to the conventional needs of the industry (Etzkowitz, and Leydesdorff, 2000). The elements of the course have become outdated and provide no or little interaction with the status and growth of the pharmaceutical industries. It becomes necessary to follow the rapid and continuous changes in

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