

Role and Responsibility of Technical Education Institutes in Innovation and Entrepreneurship

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Introduction. An entrepreneur is defined as a person, who organises and manages a business under - taking or an industrial enterprise, assuming the risk for the sake of profit. The word "enterprise" itself has a very varied meaning to cover multi- faced activities with reference to a bold and apparently difficult or dangerous, and important venture or new and risky projects, which call for energy, initiative and drive on the part of entrepreneurship. Entrepreneurship in respect of Technical education institutes, business or industries, would therefore imply a leadership of the highest calibre, which would imbibe all or most of the above mentioned attributes and qualities of an enterprises.

As per a quotable quote, mankind may be divided into two classes. Those who earn their living by the sweat of their brows;, and those who sell them hand-kerchiefs, cold drinks and electric fans etc. To a pertinent question, as to which of the persons belonging to either of the two classes, could be deemed as entrepreneurs or more enterprising, a plausible answer would be that in con-

formity with the standard definition, persons of either of the two or both the classes could be credited with being good entrepreneurs

It may be noted that the above classification of society, does not indicate its division into two disparate classes of the "privileged" and the "under-privileged" on any stereo-typed socialistic or capitalistic pattern of the "Haves" and "Have- nots", but it does symbolise the dilemma of the people, who consequent to industrialisation of society have become captives of a consumerism oriented culture, that seems to have become the distinguishing hall mark of our modern Era.

Growth of Technical Education - National Scene :

The growth of Technical and Vocational education vis-a-vis the progress of general education in India during the seven national five year plans, may be assessed from the following figures of fund allocations by the Government of India, as per Table -1 :

The Phenomenal Progress of Technical Education vis-a-vis General Education in India during the Seven Five Year Plans :

Sr. No.	Five Year Plan	Allocation for Gen.Education	Allocation for Tech. Education	Remarks
1.	First	169	33	
2.	Second	277	48	
3.	Third	560	142	Allocations
4.	Fourth	822.66	142	are in
5.	Fifth	1285	184	crores
6.	Sixth	2523.74	277.64	of rupees
7.	Seventh	5000*	400	

Table -1*Tentative Figures

It may be seen that since 1974, whereas the population of India had almost doubled from about 40 crores to about 80 crores, the expenditure on general education and technical education, during the same period had multiplied by about thirty times and fifteen times respectively, which was indeed a miracle, and may be described as a veritable explosion in terms of expansion of education in general, and technical educa-

tional in particular in the post-independence India.

Scenario in Maharashtra State:

Growth of Technical Institute in Maharashtra State, with reference to their intake capacities, and various courses are as per Table-2 :

Sr. No.	Courses	Year	No.of Instts	Sactioned intake
1.	Degree level	1968	13	2488
		1978	16	2642
		1986	76	14,250
		1988	76	14,275
2.	Diploma level			
	(including post-diploma	1968	38	4760
	correspondence course	1978	50	6373
	and	1986	255	31,350
	post-graduate Diplomas)	1988	255	31.410

Table-2

Technical Education Institutes & Entrepreneurship:

A salient feature of the scenario is that

while concerted efforts are made to build up liaison between prominent industrial establishments/Engineering concerns, and the students passing Degree/Polytechnics in the

State, a good number of entrepreneurship development programmes are also offered as a part of degree and diploma courses to help enterprising students to become employed and self-employed, and develop into good entrepreneurs. Though, there are a number of schemes formulated by the central and state Governments, to help budding entrepreneurs to establish and administer successfully their own venture, with the financial aid and expert professional guidance of Banks and other institutions catering to the needs of small, medium, and large scale industries, there is tremendous scope for Technical Education Institutes to play their vital role in promoting entrepreneurship.

In his essay on the environment for Industrial Innovation in the USA, Industrial Innovation has been described by Howard K. Nasan as "the total process of creating, developing and bringing to the market a new product and process. Usually, but not always, Industrial Innovation is based on new technologies or new combinations of technologies".

Mark Casson in his book "The Entrepreneur" states that product innovation is probably the most important form of entrepreneurship. He further maintains that a key element in many product innovations is the achievement of production versatility, which is normally obtained using a multi-component design for creating a mass market for the product.

Innovations, Research and Development :

The programme of action formulated by the Government of India, as per the National Policy on Education (1986), had laid stress on Innovations, Research and Development, as under :

R & D programmes exist in many technical institutions, Universities, and other research institutes. The main force appears to be on exploration of developing new knowledge, rather than application of knowledge for enhancing production and productivity. Designing and implementing research programmes relevant to the changing industrial requirements, are not undertaken on a wide enough scale. For correcting these imbalances, and enabling the system to innovate to Indian conditions, it is suggested that infra-structural and financial assistance for Research and Development activities in institutions may have to be stepped up.

In particular, the institutions are expected to provide necessary infra-structural facilities and resources to undertake research work for -

- (a) Improving established Technology;
- (b) Generating, adopting, and adapting new technologies to meet local requirements, and to meet challenges of latest advancements,
- (c) Developing technologies appropriate to rural development;
- (d) Enhancing productivity of technical and management education at all levels, and
- (e) Improving Management Techniques.

The Institutions are also expected to design and offer relevant programmes to train people to equip them with the requisite competencies for under-taking Research and Development activities in specified disciplines, as per the guidelines formulated by the Ministry of Human Resources Development, Government of India.

Development of curriculum and Entrepreneurship :

Quite often, complaints are received

from different sectors of industries that the engineers, and technicians produced by our Technical education institutes lack in practical experiencing, and they cannot really adopt themselves, to the industrial environment. Though, this deficiency is tried to be rectified by imparting actual practical experience to students, through schemes of apprenticeship and in-plant training, under the direct supervision of industries, there is still much scope for further improvement, so that by effecting suitable development of curriculum, more emphasis is laid on inculcation of discipline of work in life, and dignity of labour.

By and large, the main objective of our technical education institutes is to prepare candidates for manning supervisory jobs in large and medium scale Industries, which un-doubtedly is an important function. However, our Technical education Institutions must also pay urgent attention to another very important function viz; to educate and train students to develop entrepreneurial skill, which would enable them to establish small and medium scale industrial units both in rural and urban sectors, which would not only make them self-employed, and economically self-sufficient and self-reliant, but also generate more jobs for serving the educated un-employed youth of the country.

Development of entrepreneurship in this manner may in-fact, serve as a boon and a panacea, for solving many social and economic ills of the nation, facing an ever increasing population of the un-employed millions.

A few case studies :

A few instances of how some Technical Education Institutes in Bombay Region, have been instrumental in helping their young students to blossom into dynamic entrepreneurs in the sectors of small and

medium scale industries, are illustrated briefly as case studies pertaining to the development of entrepreneurship, as under :

- (i) Environmental Engineering which is described as an emerging technology, is one of the specialised courses of engineering introduced in the new colleges of engineering in Maharashtra State, consequent to the expansion of Technical Education in State, with the introduction of specialisation and diversification of courses in Engineering and Technology. A couple of students, who had graduated in 1987 in Environmental Engineering from a reputed institute in Bombay, had started their consultancy service in the field of Environmental Engineering, locating their office in a suburb of Bombay, where large number of industries are situated. Taking advantage of the relevant provisions of the Pollution Act enacted by the Government, by virtue of which industries are statutorily required to make necessary provisions for effecting pollution control of water and air, the young enterprising engineers offered their consultancy services, and after studying the pollution problems, proposed suitable measures for checking and controlling pollution. It is noteworthy that in the initial stages, the young entrepreneurs had got guidance from their own college professor. After about an year of starting the venture, the enterprise is doing financially fairly well, and a number of industries are reported to be soliciting for their professional services.
- (ii) A student, after passing his Diploma in Mechanical Engineering from a well-known Polytechnic of Bombay, instead of searching for a conventional job, had set up a factory at Bombay for producing rubber goods in collaboration with a reputed rubber goods manufacturing

firm, which is a Government of India Undertaking, situated at Trivandrum in Kerala. Partly financed by a Co-operative Bank of Bombay, the newly started enterprise executed at an estimated cost of rupees seventeen lakhs, had developed innovative production technologies in collaboration with a Japanese firm, and blossomed into an economically viable and successful industrial project.

- (iii) A student of a College of Engineering in Bombay after recently graduating in electronics engineering, had started a successful enterprise of his own, to cater to the ever expanding needs of technical education institutions in the field of audio-visual teaching aids.

In general, it may be stated that the number of students, who have passed either Bachelor of Engineering degree examinations or passed Diploma Courses in Engineering in various disciplines, and who have successfully launched their own enterprises in small or medium sectors of industries, with the financial assistance and expert professional guidance of Banks and other Government agencies, is growing day by day.

Quite a substantial number of young entrepreneurs have become builders, undertaking construction projects of Buildings, Roads bridges, etc., as well as, established a variety of industrial units in small and medium scale industrial sectors for producing and or servicing Civil, Mechanical, Electrical, Com-

puter and Electronics engineering goods.

It is noteworthy that in rural areas of India, with the ushering of a green revolution, and advent of mechanised farming, demand for various engineering goods and services, pertaining to tractors, pumps, generators and other types of agricultural machinery and their spare parts, has been increasing, necessitating expansion of Small and Medium scale Industrial sectors. Needless to emphasise, this development on the national agricultural front has opened numerous vistas of opportunities for facilitating the rapid growth and development of entrepreneurship. The role and responsibility of Technical educational institutes in the context of an over-all development of the nation's economy, through promotion of industrial innovations and entrepreneurship, thus become most significant.

References :

- (1) Technical Education in Maharashtra State, published by ISTE, New Delhi & Department of Tech. Edn, MS.
- (2) "Programme of Action - National Policy on Education, 1986" published by the Ministry of Human Resource Development, Government of India, New Delhi.
- (3) The Entrepreneur - An Economic Theory by Mark Casson (Oxford).
- (4) Technological Innovation, Govt./ Industry Co-operation, Edited by Arthur Gerstenfeld.

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