

Technical Education A Brief History And Continual Development Of Polytechnic Education In West Bengal

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In 1757, the battle of Plassey gave the Britishers unique opportunity to change their status from commercial traders to colonizers. Thus Britain's relations with India underwent a drastic qualitative change. Britain gradually captured the political power and became the rulers of this country. To rule any country the rulers should have an intimate knowledge of its topography and resources through physical survey. So in 1794, the English traders established a Survey School at Madras to train Indian personnel in modern land survey to assist British surveyor. The major initiative of starting a new centres of technical education came out of the necessity of the British rulers for training the middle level technical required for construction and maintenance of public buildings, roads, canals, ports and harbours, railways and other services as well as training artisans and craftsmen in the maintenance of instruments and equipments needed for army, navy and other technical establishments. In 1825 Technical schools were established in Calcutta and Bombay for training the artisans and artificers. These schools were attested to ordinance factories and engineering establishments. Technical education was always on demand when there was crisis like war, natural calamities, change of political power etc. but not in a systematic manner like other education system. So there were some sort of development during the period of world wars. In this process AICTE formed in 1945.

In 1947, the year of independence of India, total Engineering college was 38 and 53 other technical institutions where training at the level of technicians was given in some selected areas. The total fresh admission was about 3000 at the degree level and about 3700 at diploma level. The number was insignificant in comparison to the economic and industrial development of a country of India's size and requirement. During 1947-57 government of India fixed up the demand and supply at 4:1. This was not taken into account the demand of small scale industries and other sector of economy. In 1967, 135 institutions offering degree courses in 35 branches of engineering with annual capacity of 25000 was established. During the same period 280 institutions popularly known as Polytechnics with total annual capacity of about 49000 covering 55 subjects areas were established. At the same time 350 ITI offering training in 32 engineering and 21 non engineering trades with total capacity of 155000 trainees were established. During 1966-75, due to severe unemployment the admission was cut down by 33%. In 1974-75, Spurt in the growth of private institutions popularly known as capitation fee institution or non grant institution, on direct encouragement of state government were established in Karnataka, Maharashtra, Tamilnadu and Andhra Pradesh. Thus in 1985, with active participation of Private players the total Engineering colleges were 279(117 Public) with total intake of 57900(24300 Public) and the no of diploma level institutions were 739 (330 Public) with total intake of 114950 (51950 Public).

Since then the technical education, particularly the polytechnic education was growing in its own way detaching with the growth of state domestic product. The importance of such education was felt in the post 1990 era and gradually need of diploma engineers was attached with the growth of GDP and as well SDP. Indian states now have greater

opportunity to boost industrial growth, encourage private investment and generate greater scope of employment in a competitive environment. The responsibility of taking appropriate steps for rapid industrialisation has thus got immensely increased for the government of West Bengal. Remaining aware of the short and the long term implications of fast industrial growth, the government is pursuing policies of overall economic development of the state so that equity and social justice are ensured with achieving higher economic growth.

Any growth of technical education of a state mainly depends upon the growth of the state GDP, the social awareness, and the political willingness of the ruling party vis-à-vis their agenda of action plan and active participation on an agreed long term and short term plan of the country.

Growth path of West Bengal economy in recent time shows a falling share of agriculture in total State Domestic Product (SDP). The share has been 27.5% in 1999-2000 and has got reduced to 21.8% in 2005-2006. A relatively steady growth is, however, noticed in the secondary sector. The share has increased from 14.8% to 16.9% in the same period. The increase in the share of the tertiary sector for the same period has been more significant. The share has increased from 52.3% to 56.2%. Such growth in this sector might not get sustained in the long run unless the manufacturing activities increase significantly over time (Annul Review of West Bengal Economy and, 2004-05 and CMIE). The steady growth of SDP in the last decade with key sectors (inclusive of infrastructure) indicating significant growth has resulted in a compound growth rate of 7.07% during 1993-2004. The all India growth of Gross Domestic Product (GDP) in the same period has been 6.2%. Simultaneously with this pattern of growth, a distinct change in occupational pattern and life style of rural people is noticed through increase in per capita consumption of non-food items and increasing aspiration towards schooling and higher education.

This change in the immediate growth of economy has been brought about through dismantling of the industrial licensing regime accompanied by number of other liberalisation policies and measures, initiated in early 1990s. Indian states now have greater opportunity to boost industrial growth, encourage private investment and generate greater scope of employment in a competitive environment. The responsibility of taking appropriate steps for rapid industrialization has thus got immensely increased for the government of West Bengal. Remaining aware of the short and the long term implications of fast industrial growth, the government is pursuing policies of overall economic development of the state so that equity and social justice are ensured with achieving higher economic growth.

The government has announced its industrial policy in 1994 with an aim to achieve a faster industrial development. The government now plays the role of a facilitator in the development process and welcomes foreign technology and investment, private sector investment in power generations, improvement and up gradation of industrial infrastructure, etc. The thrust areas for special attention are petrochemicals & downstream industries, electronics & information technology (IT), iron & steel, metallurgical and engineering, textile, leather & leather products, food processing, medicinal plants, edible oil, vegetable processing & aquaculture, rubber, tea, etc. The priority sectors, identified by the government, however, are coal mining, food processing, health related industries, jute, mineral-based industries and steel.

The time series of industrial projects implemented in West Bengal since 1991 shows that the number of units has been fluctuating between 15 and 58 during 1991 to 1997 with maximum investment of Rs. 4831.35 crores, realized in 1994 (Economic Review, 2009-10, Govt. of West Bengal). From 1998 onward, the number of units has gone on increasing to reach a level of 217 in 2009. The investments, however, has reached the highest level of Rs. 7740.11 crores only in 2000 and remained more or less stable in the range Rs. 2194 crores to Rs. 2515 crores during 2001 to 2005 before showing further upward trend reaching ultimately a level of Rs. 4434.50 crores in 2008. Matched with this general upward trend, resultant direct employment has increased from 767 in 1991 to 20,563 in 2008 through 19752 in 1994 and 8821 in 2000. Estimates of Net State Domestic Product (NSDP) at current prices with base year at 1999-2000 show that it has increased from Rs. 4,888.94 crores in 1999-2000 to about Rs. 10,406.93 crores in 2008-09 for registered manufacturing industries and from Rs. 5,815.30 crores to Rs. 14,570.78 crores for unregistered manufacturing industries in the same time span. The corresponding growth trends for (1) mining and quarrying, (2) construction, (3) electricity, gas and water supply and (4) transport storage and communications under (a) railways, (b) transport by other means & storage and (c) communications have been respectively Rs. 1,299.15 crores to Rs. 2,400.41 crores, Rs. 6,421.53 crores to Rs. 33,434.58 crores, Rs. 1,225.04 crores to Rs. 6,512.42 crores and (a) Rs. 1,459.51 crores to Rs. 4,097.98 crores, (b) Rs. 5,646.09 crores to Rs. 13,722.92 crores and (c) Rs. 1,498.69 crores to Rs. 4,368.41 crores. Thus, NSDP became more than five times in the referred period for construction and electricity, gas and water supply, and it became nearly three times for communications and transport under railways. For all other industries, it got multiplied nearly two to two and a half times. Changes in the index of industrial production by sectors over April, 1999 to May, 2008 with base year as 1993-94 have been shown in the charts below for West Bengal and India. These further substantiate the growth patterns, discussed above. It also show that the state's performance has been below the all India performance except the electricity.

As per the provisional statistics of 2008 on average number of workers employed daily in different major industries, five industries employ daily about 86% of the total average number of workers, absorbed daily in the major industries. These are engineering (3,42,937), jute and allied products (2,14,334), cotton textiles and powerloom (47,498), chemical and chemical products (40,315) and tea factories (29,337). Other important industries are electricity (18,997), rice mills (18,259), printing and allied industries (16,734) and leather & leather products (15,167). Among all these industries, the ones which have shown significant growth in employing workers since 1990 are chemical and chemical products (18.1% growth), tea factories (17.7% growth), electricity (22.8% growth), rice mills (72.7% growth), printing and allied industries (10.1% growth) and leather & leather products (12.0% growth) since 2005. The growth was only about 3.7% for cotton textiles and powerloom and it was negative for jute & allied products (-3.5%) and engineering (-4.9%).

Given this composition and the growth pattern of the industries, the question arises on how the polytechnics and the industrial training institutes are to produce the diploma and the certificate holders so that the requirement of technical manpower below management level of these industries is met. Answering this question needs answering two questions – (1) how many are to be trained and (2) how they are to be trained. Answer of the first

question depends on the level of investment, the technology level and the amount of value added output, which also determine the number of technical persons, required at the management level. In other words, we may say that the first question is to be answered in the perspective of the requirement of technical manpower at degree level in different industries as requirement of technical diploma and certificate holders at lower levels gets dictated by absorption of technical degree holders at the top. Answering the

second question is possible if we know the technical manpower requirement by various trades and the quality of education which is to be achieved to match the national and the international standards of employability of technical manpower. Unfortunately, no database is available which gives the temporal growth in absorption of technical manpower in various industries by industry type and by education level. Census results available at 10-year interval give some idea about the stock and the absorption of aggregated technical manpower in different age groups for both males and females in rural and urban areas at degree and above level and also at diploma and certificate (not equal to degree) level. Detailed education level and trade wise break up of the data, however, is not available. Against this back drop, we attempted at achieving the following objectives under this West Bengal Education of Technical Council (WBSCTE) project.

**INDEX OF INDUSTRIAL PRODUCTION BY SECTORS: WEST BENGAL, APRIL 1999 TO MAY, 2008
(BASE : 1993-94 = 100)**

	MANUFACTURING									
	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08(P)	2008-09
Average :Apr-March(WB)	122.9	127.5	129.5	142	151.4	159.7	179.9	196.2	198.6	
Average :Apr-March(India)	159.4	167.9	172.7	183	196.6	214.6	234.2	263.5	287.2	
Growth %: Apr-March(WB)		3.7	1.6	9.8	6.5	5.5	12.6	9.1	1.2	

	ELECTRICITY									
	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08(P)	2008-09
Average :Apr-March(WB)	141.3	158.7	170.2	186	201.2	212.5	233	237.1	246.1	
Average :Apr-March(India)	148.5	154.4	159.2	164	172.6	181.5	190.9	204.7	217.7	
Growth %: Apr-March(WB)		12.3	7.2	9.3	8.1	5.6	9.7	1.7	3.8	

	GENERAL									
	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08(P)	2008-09
Average :Apr-March(WB)	123.8	129.8	132.8	145	154.8	163.5	183.3	198.2	200.6	
Average :Apr-March(India)	154.9	162.7	167.0	177	139	204.8	221.5	247.1	268	
Growth %: Apr-March(WB)		4.8	2.3	9.3	6.7	5.6	12.1	8.1	1.3	

Indices for April, May 2008 are Quick Estimates

1.Indices for 2007-08 are Provisional Estimates

2.Indices for 1999-00 to 2006-07 are Revised Estimates

Need of Diploma Engineers progressively up to 2020:

Sl. No.	Branch	Intake			
		2007-08	2011-12	2016-17	2020-21
01	Civil	1550	2600	3800	5600
02	Electrical	1200	2300	3200	4100
03	Mechanical	1476	2400	3300	4300

Data mentioned is raw beyond 2011-12 and obtained from an on going statistical review.

Similar trends are there for some other branches also. The polytechnic trades that are expected to be quite promising in terms of job availability are Civil, Electrical, Mechanical, Metallurgy and Mining. The trades that are not so promising but yet capable of generating employment further are Electronics & Telecommunications, Survey, Architecture, Electronics & Instrumentation, Chemical and Computer Science & Technology.

At present the total number of Polytechnic college crossed 100. But the employment have been remarkably fallen beyond any expectations. However the scope of availing the chances of higher education in graduation level has been increased substantially.

The demand of the colleges are very high with in 20KM radius of Kolkata. The upward trend of acceptance of polytechnic education due to its duration of course, further scope of higher studies, job availability and expenses of studies attract beyond the present class of students who are falling in the middle band of academic career of all sections of the society. As mentioned earlier the state government should encourage the industrialists to invest in the state for an inclusive growth, rising beyond the political agenda which may change the present economic situation.

In spite of an opportunities ahead the present quality of infrastructure, education including teaching, laboratories and workshops are far below the required standard for both public and private run institutions barring a few exceptions. Similarly opportunities are also there to change the mind set. The polytechnic education can be made more attractive with the following:

- a) A quality assurance system can be introduced.

- b) Continuous up gradation of teachers training.
- c) To construct satellite colleges by an academic oriented organisation in around Kolkata with the individual college of excellence in particular trade and sharing of the same by other colleges under the same group. Looking in to the present trend of hospitality management, Tourism & Travelling each college may start diploma in hotel management course. A corporate culture to be initiated for the development of such group of colleges.
- d) A professional HR group should be in position to continuous monitoring the recruitment of teachers and staff as per the fresh need or against wastage at any point of time. A system also to be adopted for transfer among the colleges of same group.
- e) Adoption of modern learning system and stretching the appropriate syllabus with the time and trend.
- f) BOT system has not been practised in West Bengal so far in polytechnic system but BOO can be more appropriate for getting Govt. attention.
- g) A placement cell to be there with modern outlook.
- h) Second shift to be introduced.

There are enough scope to elaborated the subject with the present need in macro level with the supporting economics.

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