Quality Perspective of Polytechnic Education in West Bengal

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Abstract—*Technical Education is one of the more significant components of Human Resource Development spectrum with great potential for adding value to products and services and for contributing to the national economy and improving quality of life of the people. Technician education has made steady progress in meeting the demand of middle level technical personnel for various sectors of national development. Quality issues in technical education are very important aspect since it bears a direct impact on the improvement of the education process.*

Keywords—polytechnic education, quality of education, skill development, growth of polytechnic.

I. INTRODUCTION

"Quality is not a science; it is a way of thinking". The development of technician education before independence till 1947 was slow and haphazard. But right from the time of gaining independence in 1947, technician education was recognized as the most significant component of human resource development having great potential for adding value to products and services, for contributing to the national economy and for improving quality of life of the people. The number of Engineering Colleges and Polytechnics (including Pharmacy and Architecture Institutions) in 1947 was 44 and 43 with an intake capacity of 3200 and 3400 respectively.

Due to the efforts and initiatives taken by the government during successive Five Year Plans and particularly due to Policy changes in the eighties to allow participation of Private and Voluntary Organizations in the setting up of Technical Institutions on self-financing basis.

The Govt. of India and state governments have been making constant efforts for qualitative improvement and quantitative expansion of the technician education system consistent with rapid changes taking place in the socio-economic, industrial and technological scenario.

In order to maintain the standard of technical education, a statutory authority - The All India Council for Technical Education (AICTE) - was set up in 1945 and Scientific Manpower Committee in 1947 paved the way for effective systemization of technician education in the country. AICTE is responsible for planning, formulation and maintenance of norms and standards, quality assurance through accreditation, funding in priority areas, monitoring and evaluation, maintaining parity of certification and awards and ensuring coordinated and integrated development and management of technical education in the country.

Technicians are precious resources and assets of our country. The need of technical education and training of this community is a top priority area for us since the success of our business and industry and hence economic development very much depends on them. Although India ranks third in the World in terms of the number of scientist and technologists, we have only 3 of them per thousand of population, against 9 in developing countries and 139 in industrialized countries.

II. PROFESSIONAL BODY

The establishment of professional body, e.g., Indian Society for Technical Education (ISTE) coming into being in 1967 is another landmark in the development of technician education system provides a forum for teachers and other professionals involved in technical education whereby they discuss / share ideas about management and administration of technical institutes, curricula, methods of teaching, laboratory and workshop development, planning for the future, in fact all matters of relevance to technician education, thereby providing inputs to the government for policy formulation regarding various aspects of technician education.

The ISTE is the only national organization of educators in the field of engineering and technology, registered under the Societies Registration Act of 1860. The major activities of ISTE are as follows:

i. To adjust curriculum and educational to changing conditions.
ii. To bring about effective linkage between technical institutions, industries and society.
iii. Summer/Winter schools for engineering teachers and practicing engineers and thus providing a common platform to the engineers from institutes and industries.

iv. Seminars/Workshops/Conferences on latest topics of relevance to technical education.
v. Special short term industrial exposure programmes for teachers organised by industries in their premises.

III. RE-ORGANIZATION OF POLYTECHNIC EDUCATION & PRESENT STATUS

On the advice of AICTE, a special committee headed by Prof. G.R. Damodaran was set up in 1970 to report on the reorganization and development of Polytechnic Education for recommending all such steps as might be introduced to improve the quality and relevance of polytechnic education.

Another major step for quality improvement was taken in 1976 when Govt. of India instituted a scheme for direct central assistance to the polytechnics by funding for special equipments for effective functioning, introduction of courses in new and emerging areas, promoting innovations in class room and laboratory instruction, interaction with industry, product design and development, instructional material development, resource generation through consultancy and testing services etc.

In the year 1986, National Education Policy on Education (NPE – 1986) was formulated and approved by Parliament, which defined Govt. policy in the areas of technical and management education. The main emphasis was on quality improvement, expansion in the infrastructural facilities in new and emerging areas of technology and making technical education accessible to special sectors of population e.g., rural population, working population, women, handicapped and other weaker sections of the society. A number of projects aimed at improving teaching-learning and developing necessary infrastructure were started in some polytechnics. This went a long way towards encouraging the development of academic leadership within the polytechnics.

In 1990, the Government of India took up the project of strengthening technical education in India with the assistance of World Bank as an important follow up of the National Policy on Education – 1986.

The State has embarked upon a major project for strengthening of Technical Education System with assistance from the World Bank by way of Capacity expansion, Quality improvement, and Efficiency improvement measures.

At present in West Bengal, the number of Government Polytechnics are 53, Govt. sponsored Polytechnics 2 and number of self-financing Polytechnics are 69 out of which 21 engineering colleges conducting diploma courses in engineering and technology. The system is offering courses in 34 disciplines of engineering and technology.

IV. QUALITY IN TECHNICAL EDUCATION SYSTEM

To make the technical education system dynamic and forward looking the Polytechnics are expected to respond to the changing needs of industries, trade, commerce, service sectors, urban and rural developmental activities. We realize the need to respond to the changing industrial needs for growth and development of the technical education in our State.

To achieve the quality education system in our State, we must look into the following areas :

i. Sharing expertise in training and development of the right kind of technical manpower in West Bengal for its developmental needs.
ii. Encouraging and facilitating co-operation between industries and polytechnics.
iii. Making training and education relevant to the changing technological needs.
iv. Undertaking joint projects to solve specific industrial problems.
v. Organizing structured Industrial visits and training of students and faculty.
vi. Sponsorship of R & D and Consultancy services.
vii. Promoting Entrepreneurship by setting up Entrepreneurship Development Cell (EDC) to promote Entrepreneurship and self-employment amongst technical students as an attractive and viable career option.
viii. Partnership approach between government and industry in all aspects of technician education, right from curriculum design to final evaluation.
ix. Continuous monitoring the academic activities by the State Council and Directorate.
x. There should be specific Rules & Regulations (common to all institutes) for the students.
xi. Providing Scholarships to the students on merit-cum-means basis.
xii. Setting up of Industry Institute Partnership Cell (IIPC) in Polytechnics as focal point for better interaction between the academia and industry.

V. NEED OF QUALITY CULTURE IN TECHNICAL EDUCATION

Growth of a technical institution is largely depends on quality system and creativity of each and every individual. Quality of technical education broadly consists of four important aspects:

1. Proper design of curricular structure and quality of course material that meet the requirements of stakeholders.

2. Student should comply with a set of standards of the institution.
3. The faculty involved in teaching should be creative, innovative, qualified with up to date knowledge.
4. The technical education should be comparable to international standard and must be cost effective.

On the quality perspective issues the objectives of Technical Education system

1. to be growth oriented and have a good reputation
2. to improve satisfaction of the stakeholders.
3. to use the creativity of faculty and students for overall institution development.
4. to provide career development opportunities of faculty members.
5. to provide job satisfaction to all levels of employees
6. to be an example to other institutions of same category.
7. to look after modernisation by removal of obsolesces at all levels.
8. to undertake Quality Assurance through Accreditation by NBA and Internal Quality Assurance Cell at institute level.

There are various factors which directly or indirectly influence the effectiveness (Quality) in technical education under the following broad heads viz.,

1. Administration
2. Infrastructure
3. Teaching Effectiveness
4. Students
5. Interaction with Industry and Society
6. Extra Curricular Activities
7. Research and Development

The primary responsibility of technical institutions is the quality of their provision and its assurance. Internal quality assurance responds to the diversity of education systems, institutions, programmes and students. Quality assurance supports the development of a quality culture within the institution. Quality assurance takes into account the needs and expectations of students, all other stakeholders and society by formation of Internal Quality Assurance Cell (IQAC) at the Institute level.

VI. GROWTH OF POLYTECHNICS IN INDIA AND WEST BENGAL

Table 1: Growth of Polytechnics in India as per AICTE

Year	Total no. of approved Institutes	Added in the Year
2010 – 2011	3254	-------
2011 – 2012	3428	174
2012 - 2013	3524	96
2013 - 2014	3890	366
2014 - 2015	4275	385
2015 - 2016	4354	79

Table 2: Growth of Polytechnics in West Bengal

Year	Total no. of approved Institutes	Added in the Year
2010 – 2011	61	-------
2011 – 2012	64	03
2012 - 2013	93	31
2013 - 2014	97	03
2014 - 2015	121	24
2015 - 2016	132	11

Table 3: Growth of intake in Diploma Programs in India

Year	Total Number of Polytechnics	Total intake
2010 – 2011	3254	10,83,365
2011 – 2012	3428	11,17,545
2012 - 2013	3524	12,12,612
2013 - 2014	3890	11,78,218
2014 - 2015	4275	13,07,404
2015 - 2016	4354	13,03,664

Table 4: Growth of intake in Diploma Programs in West Bengal

Year	Total no. of approved Institutes	Total approved intake
2010 – 2011	61	11,666
2011 – 2012	64	13,666
2012 - 2013	93	18,296
2013 - 2014	97	26,360
2014 - 2015	121	32,690
2015 - 2016	132	34,962

Table 5: Comparison of Student Intake and Establishment of new polytechnic institutes India vs. West Bengal

Year	total no of polytechnics (in India)	percentage increased (India)	total intake (in India)	percentage increased (India)	total no of polytechnics (in WB)	percentage increased (WB)	total approved intake (in WB)	percentage increased (WB)
2010-11	3254	0	1083365	0	61	0	11666	0
2011-12	3428	5.35	1117545	3.15	64	4.92	13666	17.14
2012-13	3524	2.80	121261	8.51	93	45.31	18296	33.88

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2013-14	3890	10.39	1178218	-2.84	97	4.30	26360	44.08
2014-15	4275	9.90	1307404	10.96	121	24.74	32690	24.01
2015-16	4354	1.85	1303664	-0.29	132	9.09	34962	6.95

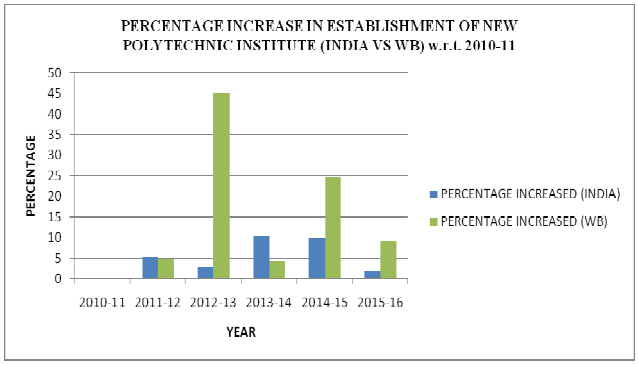

Fig. 1: Percentage increase in establishment of new polytechnic institute(India vs. WB)

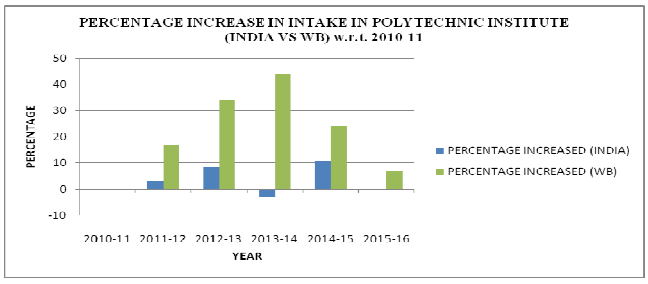

Fig.2: Percentage increase in intake in polytechnic institute(India vs. WB)

Table 6: 2000-2016: Scenario in West Bengal (As per WBSCTVE&SD)

Total No. of Polytechnics	**Govt.**	**Govt. Sponsored**	**Self financed Polytechnics**	**Engineering colleges conducting diploma courses in engineering and technology**	**Polytechnics conducting Part-time course**
124	53	02	48	21	03

VII. PLAN FOR SKILL DEVELOPMENT IN WEST BENGAL

The vision of skill education in West Bengal is to seamlessly integrate skill training in every tier of education to make it employment oriented and the youth of State self-reliant. Government of West Bengal has constituted a Skill Development Council under chairmanship of the Hon'ble Chief Minister. A Secretary Level Committee has also been constituted under the chairmanship of the Chief Secretary to implement the decisions of the Skill Development Council.

Accordingly Development & Planning Department, Govt. of West Bengal has set up a State Council on Skill Development on 14 Nov'2008 with the objectives of

i) Utilization of existing infrastructure.
ii) Creation of New Infrastructure.
iii) Setting up of monitoring mechanism at District level.

VIII. PRESENT QUALITY PROBLEMS IN TECHNICAL EDUCATION IN WEST BENGAL

To improve the quality and standard of technical education system particularly in Polytechnics, faculty development and curriculum development plays an important role. The present technical education system of the country is not able to keep pace with the industrial development and technological advancements. The problems/issues are identified that were hampering Technical Education in the state are summarized below :

1. Shortage of competent teachers both in number and in quality.
2. Practice of engagement of adhoc or daily-paid teachers is hampering quality of education.
3. Large drop-outs and failure rates.
4. Rapid obsolescence of curricula and course contents due to infrequent revision and much delayed response to technological advances and consequent market demands.
5. Retention of faculty due to non-existence of promotion policies, absence of incentives for quality performance, and non-existent staff development policies in most institutions.
6. The teachers are straight away recruited even without assessing their ability to teach.
7. Most of the self-financed institutions are not offering salaries as per AICTE.
8. The institutions do not pay adequate attention to faculty development.
9. Significant efforts are not made to develop, either self-learning skills or industry needed "soft skills" to the students.

10. Knowledge and skill acquisition by students thereby lowering their employability (only 25% at present).
11. Close links need to be fostered between technical institutions and industry.
12. Lack of Good Administrators
13. Problem of Practical Field Work and Laboratories
14. Lack of co-operation between Government, Industry and Educational Institutions
15. Common technical education policy has to be framed throughout the country
16. Improvement in institutional infrastructure
17. Improvement in teaching methodology
18. Uniform examination system
19. Mismatch between Qualifications and Industry needs.
20. Proper utilization of library services by the staff and students.
21. Lack of monitoring of educational programmes in the polytechnics.
22. Maximum percentages of students are not taking admission in polytechnics immediately after 10^{th}. standard (minimum eligibility criteria for admission) due to lack of awareness.

IX. CONCLUSION

Given the importance of technician education in the further development, the State Government is keen on developing some more institutes to improve the quality of technician education in the State. These institutes along with various private institutes have the potential of making technician education accessible to all sections of society without compromising on the quality of education. There has been a rapid growth in the number of private self-financed institutes across India in the last 20 years. The significant changes in supply and demand make it increasingly important to ensure that technical education systems and institutions are effectively and efficiently governed and managed to meet the needs of industry and society.

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