

REPORT OF THE
WORKING GROUP ON TECHNICAL EDUCATION
FOR THE
XII FIVE YEAR PLAN



GOVERNMENT OF INDIA
MINISTRY OF HUMAN RESOURCE DEVELOPMENT
DEPARTMENT OF HIGHER EDUCATION
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I. Introduction

The Planning Commission constituted a Working Group on Technical Education for the formulation of the XII Plan as per notification at **Appendix-IB**. The Working Group on Technical Education met thrice and on the basis of the deliberations, this Working Report has been finalized. The Working Group on Technical Education comprised of four Sub-Groups:

- I. Research and Innovation
- II. Technology-enabled learning
- III. Strengthening State technical institutions
- IV. Skills and employability

The specific proposal made by each of these Sub-Groups is appended with this Report (**Appendix 3B**).

II. Objectives of Technical Education

Education is recognized as one of the critical elements of the national development effort and Higher education, of which Technical Education is an integral part, is of vital importance for the nation, as it is a powerful tool to build knowledge-based society of the 21st century. The activities of Department are focused towards developing India as a knowledge society. It is the constant endeavour of the Department to improve and expand higher and technical education, with a view to eliminate disparities in access and lay greater emphasis on the improvement in the quality and relevance of education. In technical education, a number of premier institutions has been established which have come to acquire a reputation for excellence and national importance. Enhancing the global competitiveness of technical manpower, by ensuring high quality technical education to all sections of the society is an over-riding goal for the XII Plan.

Technical Education covers presently courses and programmes in engineering, technology, management, architecture, town planning, pharmacy, applied arts & crafts, hotel management and catering technology.

III. Vision and Mission

Our Vision is to realize India's human resource potential to its fullest in the Higher Education sector with equity and inclusion. The three pillars of our strategy in higher education are **expansion, inclusion and excellence**.

The Mission of the Department of Higher Education is:

- (i) Provide greater opportunities of access to higher education with equity to all the eligible persons and in particular to the vulnerable sections;
- (ii) Expand access by supporting existing institutions, establishing new institutions, supporting State Governments and Non-Government Organizations/civil society to supplement public efforts aimed at removing regional or other imbalances that exist at present;
- (iii) Initiate policies and programmes for strengthening research and innovations and encourage institutions – public or private – to engage in stretching the frontiers of knowledge;
- (iv) Skill development so as to reap the benefits of the demographic advantage of the country;
- (v) Promote the quality of higher education by investing in infrastructure and faculty, promoting academic reforms, improving governance and institutional restructuring.

IV. Achievements of the XI Plan

Eleventh Five Year plan mainly focused on increasing intake capacity (GER), starting new educational institutions, enhancing the capacity of existing ones, starting new programmes etc.

A. Access:

There are 81 centrally funded institutes of technical & science education (CFTIs) out of which 30 were created during the XI FYP:

Centrally Funded Institutions	Number of Institutions
Indian Institutes of Technology (IITs)	15 (8)
Indian Institutes of Management (IIMs)	13 (7)
Indian Institute of Science (IISc.)	1
Indian Institutes of Science Education & Research (IISERs)	5 (3)
National Institutes of Technology (NITs)	30 (10)
Indian Institutes of Information Technology (IIITs)	4
National Institutes of Technical Teachers Training & Research (NITTTRs)	4
Others	9 (8)
School of Planning & Architecture (SPAs)-3, Indian School of Mines (ISM), North-East Regional Institute of Science & Technology (NERIST), National Institute of Industrial Engineering (NITIE), National Institute of Foundry & Forge Technology (NIFFT), Sant Longowal Institute of Engineering & Technology (SLIET), Central Institute of Technology (CIT).	
TOTAL	81 (30)

In addition to the above the Central Government is implementing the following schemes/programmes:

- National Mission on Education through ICT (NMEICT)
- Technical Education Quality Improvement Programme assisted by the World Bank (TEQIP)
- Indian National Digital Library for Science & Technology (INDEST)
- **Sub-mission on Polytechnics under coordinated action for skill development:** The objective of the scheme is to enhance employment oriented skilled manpower through polytechnic. Under the scheme, financial assistance is provided to the State/UT Government for setting up of 300 new Polytechnics in unserved and underserved districts of the country. Out of 300 Polytechnics, financial assistance has been provided for setting up of new Polytechnics in 277 districts. In addition financial assistance is provided to the existing Government/Government aided Polytechnics for strengthening of infrastructure facility so far 500 polytechnic have been provided for assistance of Rs. 10/20 lakhs each.
- **Setting up of 20 new Indian Institute of Information Technology (IIITs):** The Ministry of Human Resource Development (MHRD) is setting up 20 new Indian

Institutes of Information Technology (*IIITs*) to address the increasing skill challenges of the Indian IT industry on a Public Private Partnership (PPP) basis. As per the approved scheme, the partners in setting up the IIITs would be the Ministry of Human Resource Development (MHRD), Government of the respective States where each IIIT will be established, and the industry. The capital cost of each IIIT would be Rs. 128.00 crore to be contributed in the ratio of 50:35 : 15 by the Central Government, the State Government, and the industry respectively. The project is targeted to be completed in nine years from 2011-12 to 2019-20. During the current year it is expected that 5 such institutions would be set up. The rest would be taken in the XII FYP.

- **Expansion in the AICTE approved institutions:** In addition to the unprecedented expansion in the numbers of the premier CFTI s like IITs , IIM, NITs, IISERs etc , the number of AICTE approved institutions in the country during the period has more almost doubled which rose from 4491 in 2006-07 to 8361 in 2011-12 and annual intake from 907822 in 2007-08 to 2046611 in 2011-12. Similarly, number of polytechnics has increased with corresponding rise in intake from 417923 in 2007-08 and 1083365 in 2010-11.

The growth of the institutions for the last five years and the number of students intake is as below:

Year	Number of Institutions	Added in year	Total student intake for UG/PG	Total student intake for Polytechnic
2006-07	4491	171		
2007-08	4885	384	907822	417923
2008-09	6230	1345	1139116	610903
2009-10	7361	1131	1408807	850481
2010-11	8004	643	1790751	1083365
2011-12	8361	357	2046611	987929*

* all polytechnics have not entered data.

Regional distribution of intake capacity of AICTE approved institutions in UG/PG/Diploma (all inclusive) is as follows:

S.No.	Region	Intake Approved for 2011-12	% of intake approved	Seats in 2007-08	% of seats in 2007-08.
1	Central	317932	10.48	134039	10.11
2	Eastern	178098	5.87	85279	6.43
3	North West	454237	14.97	171010	12.90
4	Northern	334128	11.01	113728	8.58
5	South Central	605993	19.97	228728	17.25
6	South West	278676	09.18	182226	13.07
7	Southern	475203	15.66	247689	18.68
8	Western	390273	12.86	163046	12.30
GRAND TOTAL		3034540	100.00	1325745	100.00

- **Schemes to be rolled over to XII FYP:** Only two scheme of the XI FYP could not be implemented namely Expansion & Up Gradation Of 200 States Engineering Institution and Establishment of 50 Centres for Training and Research in Frontier Areas of Science and Technology which would be taken up in the nest FYP.

B. Excellence:

Apart from setting up a large number of institutes of national importance / excellence as mentioned above , two major initiatives were taken to promote quality and excellence ie through Technical Education Quality Improvement Programme (TEQIP) and by initiating major reforms in the AICTE .

In 2002-03, the Government of India with the financial assistance from the World Bank launched a *Technical Education Quality Improvement Programme (TEQIP)* as a long-term Programme of 10-12 years, to be implemented in three phases for systemic transformation of the Technical Education System. The first phase of TEQIP (2003-09), covered 127 institutions (including 22 PUIs). The second Phase of TEQIP (TEQIP-II) has also been initiated and will cover around 200 institutions. TEQIP focuses on strengthening the Institutions to produce high quality engineers for better employability,

establishing centres of excellence focusing on applicable research, training of faculty for effective teaching, strengthening governance and improving Management systems.

Since AICTE covers more than 90 % of the institutions and students in technical institutions it is very essential that the working of the regulatory body is streamlined and kept in tune with the changing times . Accordingly AICTE has adopted a facilitating approach to make technical education accessible, affordable and accountable with a shift from a regime of inspection to that of voluntary self disclosure coupled by stiff penalties in case of misrepresentation. As a major initiative towards reforms, the processing of the approval cases for establishment of new institutions and extension of approval or grant of additional intake or new courses etc. has been started electronically from the year 2010-11 by providing facility for tracking of application by applicant which emphasizes on self declarations by institutions rather than inspections. The objectives of reforms is to transform the statutory body from monitoring authority to facilitating body based on rules, process driven, open to scrutiny and RTI compliant. The focus of AICTE is now on decentralized decision making.

AICTE is also considering developing comprehensive scheme for horizontal and vertical mobility of vocational students for the benefit of people from the working class and lower economic strata. This has the potential of enhancing the current GER.

C. Inclusion

The Centrally funded technical Institutions have also implemented *Central Educational Institutions (Reservations in Admission) Act, 2006* from the year 2008-09 which provides 15, 7-1/2 and 27% reservation in admission for SC/ST and OBC respectively. Through the scheme of community Development through polytechnics, preference is given to training to rural youths/SC/ST, women, school dropouts and other disadvantaged groups and helps them to obtain need based gainful employment. For Women's Hostel, 482 polytechnics have been sanctioned an amount of Rs. 20.00 lakhs/50 lakhs each so far.

Scheme for upgrading existing polytechnics to integrate the physically disabled is being implemented with the aim to integrate physically disabled persons into the mainstream through technical and vocational education.

Several *technical institution in the North East* like Indian Institute of Technology Guwahati (Assam) (ii) Rajiv Gandhi Indian Institute of Management (RGIIM) Shillong, (Meghalaya) (iii) National Institute of Technology (NIT) Silchar (Assam), (iv) National Institute of Technology (NIT), Agartala (Tripura); (v) North Eastern Regional Institute of Science & Technology (NERIST), Itanagar (Arunachal Pradesh); and (vi) Central Institute of Technology (CIT), Kokrajhar (Assam) etc. are taking care of the higher education in the North East Region. Under the scheme of construction of women's hostels in Polytechnics, Financial assistance has been provided to the existing Government /Government aided polytechnic in the state of Jammu & Kashmir and NE region. Also the financial assistance has been provided for upgradation of infrastructure facilities of Government/ Government aided polytechnic in Jammu & Kashmir and NE region. Financial assistance has been provided for 18 districts of Jammu & Kashmir and 27 districts NER region for establishment of new Polytechnics under the scheme of establishment of new polytechnic in the country in unserved and underserved districts.

V. Thrust areas and Strategies for the XII Plan:

The main focus of the XII FYP would be on the consolidation of the achievements of the previous plan in terms of completion of the civil works of the CFTIs. Due to various reasons including delay in availability of land etc the pace of expenditure during the XI FYP could not match up with the expectations . Out of the XI plan outlay of Rs. 84,943 crore for the Department of Higher Education, Rs. 27,334 crore was earmarked to Technical Education out of which the actual expenditure up to 2010 -11 has been 89%:

Year-wise Expenditure

Allocated	BE	Actual Expenditure (In Rs.)
2007-08	3240.00	1067.01
2008-09	3205.00	2840.77
2009-10	3902.00	3628.39
2010-11	4706.00	5743.37
2011-12	5660.00	2383.83*

* upto September, 2011

The emphasis therefore has to be on completion and consolidation of the existing schemes rather than setting up new institutions on large scale. A major part of the funds during the XII FYP will therefore have to be earmarked for the on going schemes as most of them have only just been started.

A. Research, Innovation and Autonomy:

Even though the number of technical institutes in India have increased, Indian education system continues to be weak in Research and Innovation. In 2010, MHRD had set up the Kakodkar committee, with a mandate to make the IITs amongst the leading technical institutes in the world as regards Research, Development and Innovation and at the same time, suggest means for IITs to get autonomy. The recommendations of the committee would be equally valid for all educational institutions that strive to improve their research and faculty as the IITs and other premier technical institutions would be working closely with the engineering collages and the Industry.

The committee recommended that each IIT acquire certain size with the enhancement largely coming from Research Scholars; it thus provided a plan to increase the number of Ph.D students in IIT system **ten-fold in about ten years**. The increased strength would come from early identification (by the end of third year) of bright B. Tech. students in any institute in the country, who are capable and motivated to carry out Research and admitting them straight to a PhD program at IITs at the end of the third year. This will be complimented by enabling young teachers in Indian engineering colleges and

professionals to pursue part-time PhD at IITs. On the one hand this would strengthen engineering colleges and on the other hand it will strengthen the R&D capabilities of the Indian industry. The committee also provided a plan to carry out a multi-fold increase in the number of faculty in IIT system to **16000 in about ten years** and would like to see that one PhD student graduate per faculty every year..

The Kakodkar committee also proposed that IITs get significantly enhanced funding for large, collaborative, and focused programs of research involving multiple disciplines and multiple institutions with the aim of strengthening a certain sector in India. Towards strengthening academia-industry collaborative work and encourage technology commercialization, innovation and entrepreneurship, it encouraged IITs to set up Research Parks where industry could house their R&D. The committee also recommended that each ministry and public sector company sets apart 2% of their budget towards R&D and set up R&D labs at IITs or their research parks so as carry out joint R&D activity with IITs. The committee expected that this will result in significant quality enhancement for R&D and bring in a focus for technology development as per India's needs and requirements. Further, IITs will run an executive M.Tech program for industry personnel to be conducted entirely using live video classes on high-speed network.

During the XII Plan, it is proposed to strengthen research in all Central-Government funded institutions and create a climate of research within institutions. A hierarchy of research challenges/ agenda and strategies for different levels is proposed to be put in place. The top end research would fall within the ambit of Department of Science and Technology. However, the higher educational institutions must focus on basic research and also development of capacity building for research. The thrust would be on spreading the culture of research, empowering research institutions as well as increasing the quantity and enhancing the quality of research. There is a need for enhancement of research fellowship, setting up of innovation centers in Universities.

The proposed scheme of establishment of *50 Centres for training and research* in Frontier Areas of Science and Technology which was to be launched in the XI Plan will be implemented in the XII Plan. In order to make a meaningful & powerful impact, in the world market, it is important for the country to diversify into new emerging frontier areas of science & technology. For the purpose, it was proposed to establish 50 centres of excellence for advanced training and research in the following areas: Biotechnology, Bio-informatics, Nano- materials and Nano-technologies, Mechatronics, MEMS, High Performance Computing, Engineering/Industrial Design, Chaos, Complexity and Self-organizing systems, Professional/Business/Technical/Engineering Ethics, Value Education and Consciousness Studies, Leadership, Communication, Creativity, Innovation and Soft Life Skills Training and Development.

Research culture so far has been limited to some of the better institutions, and most other institutions have still to embrace this culture. While a large number of factors are responsible for this state, it was felt that co-existence of the research culture is a must for the quality of these institutions, since such a culture ensures a continuous, self up-gradation of the faculty through involvement and advance of knowledge in their respective domains. Introducing a research culture, therefore, is a must for the all round development of the institution on the one hand, and its impact on society on the other. A larger eco-system of research is the need of the hour. Some key steps, which, if undertaken during the XII Plan period, could significantly boost the research scenario in technical education in the country are:

- Increase the Research Scholar Population of the country through induction of talented, research-minded young B. Techs into the Ph.D program directly.
- Provide Research Support Centrally to Identified State and Private Universities and Technical Institutions.
- Facilitate Research through Linkages between academy, industry and national research labs.

- Expand Quality Improvement Programme (QIP) in scale and scope to cover 500 to 1000 fellowships every year.

As regards *innovation*, there is a need to build adequate linkages with industry. The Kakodkar committee recommendation of earmarking 2% of funds for research purposes by all Government Departments need to be seriously considered for implementation in the XII Plan (**details annexed**).

Need to promote *social engagement* such as done by amendments in the IIT Act needs to be broad-based. Each of the IITs will strive to meet the technological needs of the States and Union Territories, included in its zone, inter alia, by supporting and collaborating with technical education institutions located therein and rendering advice on matters pertaining to technical education as well as technological problems referred by the concerned States and UTs.

There is a proposal to promote innovations by expanding the *Technology Business Incubation Infrastructure*. Some of the better institutions like IITs have created technology business incubation facilities in their campuses, which are proving to be focal points for promoting innovations amongst students and faculty, to consider working towards taking some of their applied research to the market through creation of business models for the same. These efforts need to be expanded greatly (a) by scaling the previously successful centres of such innovations, and (b) by creating many such centres across the higher technical institution in the country.

The *use of information and communication technology* in educational transactions serves to improve the quality of teaching learning. ICT needs to be effectively harnessed by all technical institutional so as to enhance the quality of academic programmes. Newer technologies, such as, video conferencing, online teaching, virtual class rooms must be employed for enhancing the learning experience by the students. The faculty must be encouraged to leverage ICT for better learning outcomes. It could be deployed even for

assessment of the student's performance. ICT needs to be used as a tool across all institutions and necessary infrastructure must be made available to institutions, particularly those located in rural areas. The need to synergize with Departments of Power, New and Renewable Energy, to ensure adequate power supply for use of computer infrastructure is an essential requirement for ICT to be successful. The National Mission on Education through ICT (NMEICT) addresses the components of providing connectivity, developing e-content across disciplines and development of low cost devices. It adopts the four quadrant approach for an enriched interactive learning platform which covers pedagogy, interaction & interface, continuous learner support and assessment & evaluation. It also has capacity-building as a major objective.

Curriculum must undergo mandatory revision to keep with the current economic needs. Common minimum curriculum or Model Curriculum, with emphasis on 'Core courses', needs to be developed. Institutions of national importance must encourage basic science courses or foundation courses during their summer and winter vacations. Basic integration between science and humanities is required. The integrated B.Tech., M.Tech., Ph.D programme model must be encouraged. Need for contemporary and relevant courses in Planning and Architecture. 3000 odd polytechnics must strengthen their academic quality by improving the quality of courses and developing a comprehensive curriculum which has both basic and advanced courses.

Affiliation system must be given up as it has killed the academic system. The controls on affiliating institutions need to be reduced. The *governance structure* of each institution would be different, depending upon the faculty and other aspects. A best practices document covering various types of institutions and their governance structure must be brought out. The need to harmonize autonomy with accountability is important to ensure a degree of flexibility and freedom without losing the sense of fiscal and administrative accountability. Internal checks and external controls must be weaved in a manner that

allows institutions to breathe freely in academic matters and reduce administrative procedures which are duplicating and at times stifling.

B. Strengthening State technical institutions:

Whereas the growth in technical education in terms of quantity has been substantial as indicated in the above table, the same cannot be said about the quality. The poor quality of technical education, a bulk of which falls under the States and mainly in the private sector, is mainly due to the poor governance structure, unqualified faculty, absence of research and industry interface and low finances. Several measures are planned for the XII FYP to strengthen State level technical institutions which constitute nearly 90 per cent of technical education sector.

The scheme for expansion and upgradation of *200 State Engineering Institutions* which was approved in the XI Plan and could not be launched will be taken up for implementation in the XII Plan. The objective is to empower all such engineering colleges which suffer from deficiencies in terms of academic infrastructure, equipment, faculty, library, accommodation, physical facilities by providing them one time grant so as to ensure that all such institutes attain the quality norms. The purpose of the scheme is primarily to promote quality where it is already seeded and initiate it where it is not.

C. Strengthening Private Technical Institutions in the Country

A total number of 3,241 engineering institutions are established in India out of which more than 90% are *private unaided institutions (PUIs)*. In 2002-03, the Government of India with the financial assistance from the World Bank launched a Technical Education Quality Improvement Programme (TEQIP) as a long-term Programme of 10-12 years, to be implemented in three phases for systemic transformation of the Technical Education System. The first phase of TEQIP (2003-09), covered 127 institutions (including 22 PUIs). The second Phase of TEQIP (TEQIP-II) has also been initiated and will cover around 200 institutions. The total number of PUIs to be selected for participation in this

phase is limited to about 20% of total project institutions. Based on the need to improve quality of engineering education in private unaided institutions and their eagerness, MHRD proposes a parallel project, TEQIP-III, solely for PUIs. To strengthen the quality of Private Unaided Institutions (PUIs) to produce high-quality engineers for better employability through improvement in the quality of faculty and strengthening institutions. The Project will also focus on pedagogical training of faculty for effective teaching; and enhancing institutional and system management effectiveness.

Their challenges with respect to achieving 'Quality' in private engineering education have to do with the need to 1) Strengthen Faculty, 2) Provide colleges with more academic autonomy, 3) Enhance transparency in governance and regulation of these institutions and 4) Improve their finances.

Strengthening *technical faculty of the PUI* is very crucial and TEQIP III will have a major component on this. One of the serious concerns affecting the quality of technical education is the *lack of qualified faculty and the severe shortage of faculty*. Faculty mapping has already been undertaken by AICTE and the discipline-wise vacancies, and qualification-wise availability of faculty has been worked out. AICTE has made an enabling provision by permitting second shift for PG Engineering. ICT can be effectively harnessed and leveraged to meet with the faculty shortages.

Due to the shortage of faculty, many engineering colleges are forced to recruit fresh engineering graduates as teachers. These fresh recruits need training in pedagogy as well as knowledge upgradation. The existing institutions that can impart training are limited. Also, it is not feasible for the college to release these teachers for undergoing training. The plan is to set up a new part-time **Masters' degree in Engineering Education** to be conducted by the IITs. The degree, designed for faculty from engineering colleges will be conducted online, through live video lectures using the NKN, thus eliminating the need for participants to be relieved of normal teaching duties. It is estimated that 6 to 7 thousand young faculty can be handed out each year. Approximately 1500 faculty from

IITs and other institutions will carry out teaching the courses in the evening and weekends. IIT faculty will also be able to identify and motivate many of these young candidates to carry on a Ph.D programme. It is aimed to train approximately 30,000 college-faculty in the 12th plan in this manner and another 30,000 to 40,000 in the 13th Plan.

Another proposal would be to introduce to a new three year programme leading to a *Dual Masters Degree* i.e an M.Tech degree in the domain area and a Masters degree in Educational Skills and Pedagogy.

Other existing / ongoing schemes in faculty development such as *Quality Improvement Programme (QIP)*, *Early Faculty Induction Schemes*, faculty development programmes, enhancing research fellowships for Ph.D must be continued in the XII Plan. Industry associations have also suggested strategies for training of engineering faculty, which can be experimented in a pilot mode.

Strengthen and empowering affiliated colleges by giving autonomy to create courses for some proportion (roughly half) of the total programme, while the affiliating University keep control over the rest of the courses, mainly the basic ones. Affiliated colleges would take charge of the rest of the curriculum, conduct examinations and grade these courses. This will provide college-faculty with the opportunity to update courses continuously and be creative about teaching methods and about conducting examinations.

Enhancement of transparency with regards to governance and finances (including all income from fees, endowments or other receipts, payouts in the form of faculty and staff salaries and all capital and operating expenditure) of institutions by making it mandatory to furnish institutional profiles on the website would be another condition for TEQIP III funding . In addition, MHRD would create institutional profiles for each college containing as much public information as possible. These include criteria such as i) the opening and closing ranks of admitted students in the qualifying exams, ii) the

qualification and performance of teachers, iii) the performance of their graduates, iv) details of the Board of Governors, labs etc., v) ratings by agencies such as NBA/CRISIL and vi) the extent of compliance with AICTE guidelines.

It is necessary to provide adequate financial support to ensure quality. AICTE must compute and publish realistic costs of the engineering education (both capital and operating expenditure) and arrive at *bench mark figures for fees in colleges*.

Mechanisms of *incentivizing State engineering institutions* on the lines of upgrading REC's to NITs' or the process adopted by TEQIP to fund institutions must be adopted for all technical institutions including private ones.

The role of private players in the field of Technical Education must be recognized and their views must be taken on board in any policy making exercise. The Government must provide a platform for presenting the views of the private sector and thereby take their concerns and address them to ensure their participatory role in the development of technical education in the country. For instance, during consultations for policy formulation, organizations such as the FICCI, CII, NASSCOM and other corporate bodies, organizations such as FAMPEI (Federation of Associations of Managements of Unaided Professional Educational Institutions in India) must be invited. The relation between government and private colleges must be one of mutual co-operation and trust. For instance, faculty from IITs can also be encouraged to share their expertise with private colleges, for which mechanisms can be put into place. In the near past, a very large number of new generation Engineering Institutions are established in small towns and hinter lands. These are catering to the backward and under privileged sections of the society in a big way. These institutes are playing a major role in ensuring inclusive education but they receive very little support and encouragement. It is suggested that soft support such as capacity building and faculty enrichment with mentoring by Central institutions and other Government engineering/ management institutions could be a strategy to address these concerns.

While there are over 10,000 technical institutions in the country, there are wide *region-wise disparities* in the location of the institutions as well as in their intake capacity for which proactive action needs to be taken. During the XI Plan, several new institutions have been established in hitherto uncovered States. New polytechnics were also established in uncovered districts to bring about regional parity. To ensure equity, scholarships and interest subsidy schemes were launched in the XI Plan and these will be continued in the XII Plan. In fact the strategy is to enhance scholarships so that no deserving student is denied access to technical education for want of resources. In short a 'means blind and merit based' approach is to be adopted. The affirmative action for inclusive education for disadvantaged sections such as SCs, STs, OBCs and physically handicapped will continue in the XII Plan, with focus on women and minorities too. During the XII Plan, community polytechnics for the disabled, polytechnics for women are targeted measures for inclusion. *Strengthening existing institutions in the North East* is another strategy planned for reducing regional disparity.

During the XI Plan, 20 IIITs and 300 new polytechnics were proposed through the *PPP mode and private sector participation*. Both these schemes could not take off due to poor response from the private sector. The resource limitations of the Government necessitate funds and investments from the private industry in the Higher Education sector and more so in technical institutions where the viability is more certain. By making necessary changes in the above schemes, it is hoped that during the XII Plan, greater private sector investment will be created.

D. Skills and employability:

A major concern is the lack of employable skills in our technical education students. In the XII Plan, this area is being accorded high priority as it will critically impact the development strategies. We are looking at the country's large youth population as an advantage point. But in order to leverage this demographic factor, we need to ensure that

our youth are empowered with the right skills to meet the challenges of knowledge based market economy. Based on the identification of the skill gaps in different sectors, possible approaches, such as, setting up of finishing schools, offering courses for enhancing employability are proposed. Some strategies for increasing employability factor, which are either faculty-centric or student-centric are: Industry Institute Student Training Support, Industrial Challenge Open Forum, Long Term Student Industry Placement Scheme, Industry-Institute Continuous Interaction Scheme-Industry, Industry-Institute Continuous Interaction Scheme-Faculty, Intensive Interaction - Train The Teachers, Industry Training Programme And Support Scheme, Centre for Qualified Manpower, National Employability Portal, Tax Benefit for Teaching Laboratory Support. Some strategies for the Skills component with focus either on institution or students are: Skills Requirement Assessment Revitalizing the Diploma Education, Lateral Entry of ITIs to Diploma Programme, Vocation based Certification Programme, Industrial Finishing Schools, Bridge Courses for Skill Enhancement, Special Manpower Development Programme.

In addition to the above MHRD has launched a major initiative in the form of National Vocational Education Qualifications Framework (NVEQF) which is the proposed overarching academic architecture for vocational education in the country. A unified mapping of Class IX to XII and up to level 7 (Bachelors in Vocational Education) has been done and a detailed scheme drawn up for strengthening skills and developing vocational education by involving CBSC / State Boards, Technical Education Boards, Universities and NSDC and the Industry. The idle infrastructure of existing institutions and building with the industry could be utilized for speedy implementation. These vocational courses would have a component of general education also which would facilitate mobility into and from mainstream education. Also, being modular in nature it would provide multiple entry and exit options to the students. NVEQF will be fully compliant with the overall National Occupation Standards (NOSs) being created by NSDC for Skill Development in the country with the involvement of the Industry.