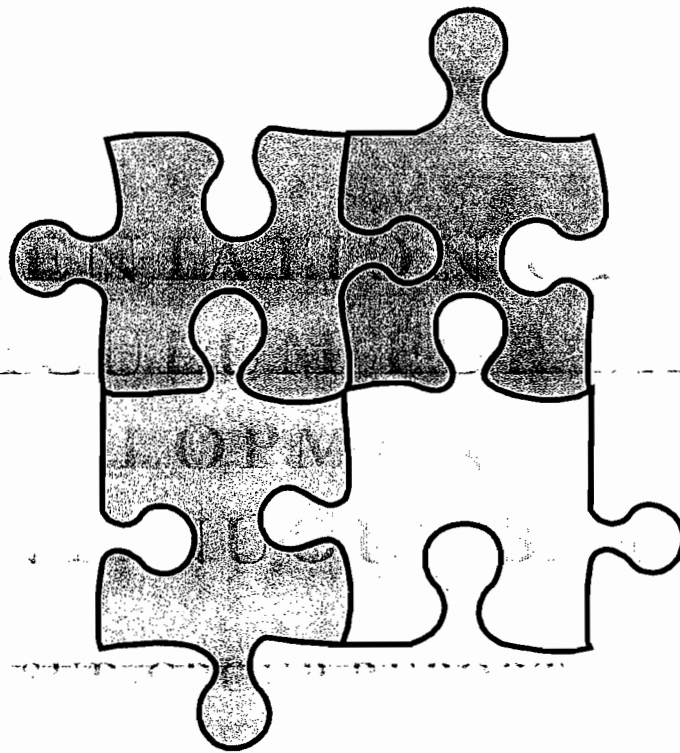


REORIENTATION OF THE CURRICULUM FOR SKILL DEVELOPMENT ON CONTINUOUS BASIS

SUB-GROUP REPORT



Submitted to
**PLANNING COMMISSION
GOVERNMENT OF INDIA**

CONTENTS

Terms of Reference for the Sub-Committee	01
Members of the Committee	01
1. The Indian Economy	03
2. Employment Growth	03
3. Demographic Advantage	05
4. Requirement of Skilled Human Resource	05
4.1 Information Technology Sector	07
4.2 BPO (Business Process Outsourcing)	08
4.3 KPO (Knowledge Process Outsourcing)	08
4.4 Retail Sector	08
4.5 Hospitality	09
4.6 Entertainment	09
4.7 Aviation Sector	09
4.8 Construction Sector	09
5. Present Education and Training System	10
5.1 Vocational Education Programme	10
5.2 Vocational Training Programmes	12
6. Curriculum Development	16
6.1 Curriculum Design Phase	16
6.2 Curriculum Development Phase	17
6.3 Curriculum Implementation Phase	17
6.4 Curriculum Evaluation Phase	17
7. Why Curriculum Reorientation?	18
8. International Experiences	18
9. National Scenario	19
9.1 Curriculum Development for +2 Vocational Education Programme	19
9.2 Curriculum Development for Vocational Training Programme	20
9.3 Curriculum Development for Technical Education	20
9.4 Curriculum Development for Undergraduate and Post Graduate Programmes	21
9.5 Curriculum Development for Open Vocational Education and Training	21
10. Recommendations	25
11. The Way Forward	30
Annexure – I	31
References	44

Executive Summary

The Indian economy has posted a phenomenal growth in the last decade thus gaining greater respectability and credibility in the global economic scenario. Despite the global economy slowdown, the Indian economy has grown at close to 6.7 % in 2008-09. The country is still holding its ground in the midst of the current global financial crisis. The future economy of India is expected to be the knowledge intensive service economy.

Development of competencies, which include knowledge, skills, attitude and values should become a significant part of the forthcoming knowledge revolution in India. It is estimated that in India the largest number of new jobs will be created in the service sector, adding some 120 million jobs by the year 2020. The most promising sectors would include financing, insurance, education, health, construction and real estate, advertising, printing, and packaging. These sectors have witnessed much higher growth in recent times than the average growth.

India aspires to become the world's largest pool of skilled human resource and professional workforce. PM's Council on National Skill Development has set a target of creating 500 million skilled people by 2022 with emphasis on inclusivity so as to deal with divides of gender, rural/urban, organized/unorganized, employment and traditional /contemporary workplace. A National Policy on Skill Development has been formulated in 2009. To realize the objectives of the National Policy on Skills Development, it is imperative to create a system of education and training which could impart skills to the young and ageing population for an inclusive and sustainable economic growth. Approaching inclusive growth through skill development will require extending the reach of the VET system and improving the access to skill training for all. In this context, the terms of reference of the present sub-committee assume importance dealing with crucial issues of curriculum development and reforms.

Besides the vocational education and vocational training programmes under MHRD and MoL&E respectively, there are several other VET programmes and activities under the purview of other Departments/ Ministries, which include Ministry of Health and Family Welfare, Ministry of Rural Development, Department of Women and Child Development, Ministry of Agriculture, Ministry of Micro, Small and Medium Enterprises, Ministry of Industry, Ministry of Rural Development, Ministry of Urban Employment and Poverty Alleviation, Ministry of Information Technology, Ministry of Tourism, Department of Small Scale Industries, Khadi and Village Industry Commission, etc.

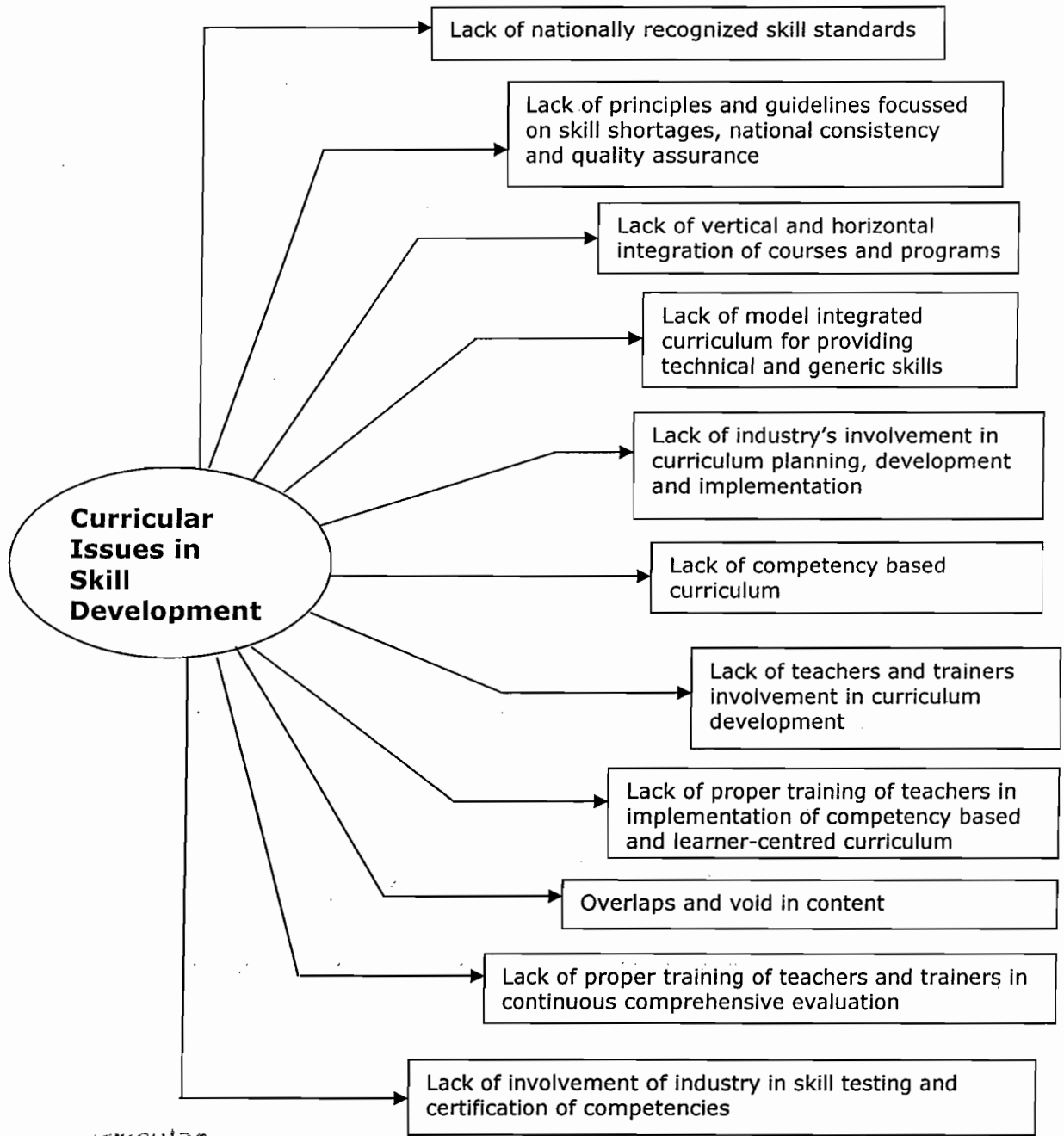
Reviewing or changing the curriculum is the re-planning of the breadth or scope of knowledge and skills. The improved, more effective outcomes bring about the required student learning in accordance with current expectations. The development and review of curricula is a complex exercise since it involves integration of not only the current educational and pedagogical needs of the subject area but also the anticipated needs arising out of the fast changing market scenario and skill standards. The development of

an effective curriculum is a multi-step, ongoing and cyclic process. The process progresses from evaluating the existing initiatives to designing a programme, implementing it and evaluating leading to a revised design of the programme, thus the process continues.

The curriculum of any skill development programme should be guided by the job market opportunities or should be reoriented to prepare entrepreneurs. It should meet the demand of the expanding avenues generated by the changes in technology, agricultural practices, and marketing strategies. The big question that we need to ask first is "Whether the existing curricula offered at various levels are oriented towards the need of the job market or can fulfil the requirements for developing entrepreneurial capabilities in the learners? If no, then what kind of reorientation is needed to prepare curricula which not only fulfil the market needs but also develop 'life skills' needed for making people employable? To cope with the emerging needs in the job market, a comprehensive review of the existing curricula and teaching-learning materials available for the skilled development programmes, both long term and short term, should be initiated at the national and state level to reorient the curricula suited to the needs of the job market and entrepreneurship development.

At the national level, the exemplar competency based curricula for vocational courses at 10+2 level are prepared by the PSS Central Institute of Vocational Education, a constituent of NCERT located at Bhopal. The Central Staff Training and Research Institute at Kolkata prepare draft curricula and revise from time to time. It obtains approval of the National Council for Vocational Training. The All India Council for Technical Education has initiated a programme to upgrade the syllabi for under-graduate education in technical institutions. The major QIP (Quality Improvement Programme) Centers are provided assistance to organize workshops for curriculum development. This leads to Model Curriculum, which is used as base document by many institutions. Universities are autonomous bodies and each has its own system of developing and revising curricula. They usually have specialised bodies e.g., Committee of Courses, represented by the concerned faculty members in the University and a few external members in or the related fields. Sometimes national level bodies, such as Indian Council for Agricultural Research, University Grants Commission, etc. issue guidelines or exemplar curricula. The National Institute of Open Schooling and the Indira Gandhi National Open University are offering vocational courses through open and distance learning mode.

The key curricular issues that need to be addressed for bringing about necessary reforms in skill development programmes are given below:



Recommendations

Recommendation	Expected Outcome	Key Agencies	Key Actions
<p>Establishing flexible learning pathways through National Vocational Qualification Framework (NVQF).</p>	<p>Establishment of NVQF for a nationally recognized qualification and demand driven multi-entry and multi-exit VET system.</p>	<ul style="list-style-type: none"> • NSDCB • NSDC • MHRD • MoE&L • SSCs • CII • FICCI • ASSOCHAM • AICTE • PSSCIVE • IGNOU • CBSE • State Boards • Councils such as RCI, NCTE, NCERT, CIDC, MCI, etc. 	<p>A mechanism may be developed for close collaboration between MHRD and MoE&L so that appropriate planning may be carried out in all areas of vocational education and training and development of NVQF.</p>
<p>Identifying skill and learning needs and developing curriculum attuned to the needs of the employers and self-employment opportunities.</p>	<p>Areas of overlaps and voids are identified, especially at the middle and the lower level. Competencies required for each occupation and skill standards are identified.</p>	<ul style="list-style-type: none"> • SSCs • NSSB (to be established) • PSSCIVE 	<p>Identification of learning needs and skill identification and standardization should be done by bodies like Sector Skill Councils or Consortia. Based on skill standards, competency-based curricula should be developed. The curriculum should be approved by the Sector Skill Council. A National Skill Standards Board (NSSB) may be established for creation and adoption of a national system of voluntary skill standards throughout the country.</p>
<p>Developing National Curriculum Framework for Vocational Education and Training.</p>	<p>A national curriculum framework for VET.</p>	<ul style="list-style-type: none"> • NCVT • NCERT • CBSE • State Boards of Examination 	<p>The NCVT and NCERT should together prepare a National Curriculum Framework for VET. They may set up a joint empowered committee to review and revise all existing syllabi and textual material available for vocational education and training</p>

			courses. Similar exercise may be initiated by NCERT in collaboration with CBSE and the Boards of Secondary Education in States/UTs for the Vocational Education Programme at 10+2 level.
Developing curricula responsive to the needs of the industry, changing work organizations and market structure	Competency-based curricula responsive to the needs of the industry, changing work organizations and market structure would be available.	<ul style="list-style-type: none"> • SSCs • NSSB (to be established) • MHRD • MoE&L • NCVT • NCERT • PSSCIVE 	Guidelines for learner's need identification, skill identification and standardisation, curriculum development and reforms, keeping in view the need for various sorts of skills should be developed for bringing about necessary uniformity in the curriculum development process. Nationally recognized guidelines for development of competency-based curricula and instructional materials should also be prepared. Model curriculum, which caters to the skill needs of the industry, changing work organizations and market structure should be provided to the schools, VET Institutions and Universities to serve as a base and to facilitate the whole exercise of developing and updating the curriculum. The curriculum of the courses run by the Institution should compulsorily be placed on the website of curriculum development agency and Institutions offering courses for wider dissemination.
Empowering teachers and trainers in the competency-based curriculum development process and implementation	Trained teachers in competency-based curriculum development and implementation	<ul style="list-style-type: none"> • NCERT • PSSCIVE • NITTTR • CSTR • SCERT 	Regular training programmes for the experts and teachers to empower them in competency-based curriculum development and implementation should be organized. Application of IT skills should also be

			promoted through these programmes.
Enhancing individual's employability and productivity through an integrated curriculum	An integrated curriculum, comprising academic and workplace skills, should have various sorts of skills: (i) generic or soft skills, which are more context-specific (including livelihood skills) and (ii) vocational skills.	<ul style="list-style-type: none"> • NCERT • PSSCIVE • SSCs 	Various models of integrated curriculum should be developed which may include (i) incorporating more academic content in vocational courses, (ii) incorporating vocational component in academic courses to make the latter more relevant for the world of work, and (iii) aligning existing vocational and academic curricula to make them compatible with each other and to suit the needs of vertical and horizontal mobility.
Involving industry in skill assessment and certification	Representatives from industries would participate in developing benchmark for assessments to evaluate skills, knowledge, and abilities in classrooms and on-the-job training. Industry would participate in joint certification of competencies.	<ul style="list-style-type: none"> • SSCs • CII • FICCI • ASSOCHAM • Sector-wise Associations and Councils 	Working groups should be constituted by the SSCs to identify critical work functions, performance indicators and competencies based on skill standards that need to be assessed for certification. Certification of the competencies should include knowledge and skills gained through experience, training, and self-study.
Updating curricula regularly for developing the learner's ability to adapt to the changing technologies	Review and revision of competency-based curricula, keeping in view technological changes, would be done every year and at least once in 3 year.	<ul style="list-style-type: none"> • SSCs • NCERT • PSSCIVE • NCVT • CII • FICCI • ASSOCHAM 	The review and revision of competency-based curricula should be undertaken every year in collaboration with employers or industry partners and the information on the curriculum evaluation should be widely shared with the education/training institutions and industry partners.

Terms of Reference for the Sub-Committee

1. Identify the areas of overlap between different streams such as University, AICTE, and NCVT, etc. and make recommendations to avoid duplication.
2. Identify the areas of void, i.e., particular skills for which there is no standard curriculum or providers and make recommendations to assign the making of curriculum to appropriate bodies including special/existing sectoral /inter-sectoral skill councils. In particular, study-groups to be set up for evolving bouquets of skills in the twenty-one high growth sectors.
3. Identify other skill development modules/courses which are already within the specific charge of an established body with a view to prod such bodies into reviewing the course curricula in tune with the developing ground realities.

Members of the Committee

The sub-committee comprises the following persons:

1. Dr. Swati A. Piramal Chairperson
Vice Chairperson, Piramal Life Sciences and
Director, Piramal Healthcare Limited,
Mumbai
2. Shri Subhash C. Khuntia Member Secretary
Joint Secretary
Department of School Education and Literacy,
Ministry of Human Resource Development,
Government of India,
New Delhi
3. Shri Amarjeet Sinha Member
Joint Secretary
Ministry of Health,
Government of India,
New Delhi
4. Executive Director or his Representative Member
ITC Ltd.,
New Delhi
5. Director General or Representative Member
Society of Indian Automobile Manufacture,
New Delhi

Department of School Education and Literacy

- | | | |
|-----|---|-----------------|
| 6. | General Secretary or Representative
Indian Printing, Packaging and Allied Machinery
Manufacturers Association (IPAMA),
Noida | Member |
| 7. | Secretary or Representative
Association of Motion Pictures and TV
Programme Producers,
Mumbai | Member |
| 8. | President or his Representative
Federation of Small Scale Industries,
Vadodra | Member |
| 9. | Shri Sanjay Dave
Director,
Agricultural and Processed Food Products
Export Development Authority (APEDA),
New Delhi | Member |
| 10. | Professor Poonam Agrawal
Joint Director,
PSS Central Institute of Vocational Education,
131, Zone II, M.P.Nagar,
Bhopal | Co-opted Member |

Subsequently by the Planning Commission notification No. 13015/12/08-LEM/LP dated 10.8.2009, Shri Amitabha Bhattacharya, Principal Adviser, Planning Commission was appointed Chairman, in place of Dr. Swati A. Piramal.

1.0 Indian Economy

The Indian economy has posted a phenomenal growth in the last decade thus gaining greater respectability and credibility in the global economic scenario. The overall growth of GDP at factor cost at constant prices in 2008-09 as per the revised estimates released by the Central Statistical Organisation (CSO) (May 29, 2009) was 6.7 per cent (GOI, Union Budget and Economic Survey (UBES), 2008-09). According to Central Statistical Organisation and Department of Agriculture and Cooperation, the agriculture sector which accounted for 17.1 per cent of the Gross Domestic Product (GDP-at constant prices) in 2008-09 still accounts for the 52 per cent of the employment in the country. The industrial sector recoded robust rate of growth in excess of 8% during 2004-05 to 2007-08 (ibid). The service sector has become a major part of the economy with GDP share of over 50% and the country is becoming an important hub for exporting IT services (ibid). According to NSS 63rd Round, about 1.65 crore service sector enterprises and 3.5 crore persons were estimated to be working in service sector in India during 2006-07 (NSSO, July 2006-June, 2007). The share of merchandise trade to GDP increased to over 35 per cent in 2007-08 from 23.7% in 2003-04. If the trade in services is included, the trade ratio is 47 per cent of GDP for 2007-08 (GOI, UBES, 2008-09). The domestic demand conditions are strong and continue to be supportive for growth in this sector. During this period of stable growth, the poverty is reported to have reduced by 10%.

Despite the global economy slowdown, the Indian economy has grown at close to 6.7 % in 2008-09 (GOI, UBES, 2008-09). The country is still holding its ground in the midst of the current global financial crisis. Growth has been supported by market reforms, huge inflows of Foreign Direct Investment (FDI), rising foreign exchange reserves due to Information Technology and boom in real estate. The continuing flow of FDI reinforces the positive view that the Indian market has the capacity to absorb investment and generate a return based on productive growth (GOI, UBES, 2008-09). Higher FDI inflows in 2008-09 were also a reflection of the confidence of foreign investors in the growth prospects of the Indian economy. The future economy of India is expected to be the knowledge intensive service economy. Development of competencies, which include knowledge, skills, attitude and values should become a significant part of the forthcoming knowledge revolution in India.

2.0 Employment Growth

India's population is projected to increase from 1.029 billion to 1.400 billion from 2001 to 2026 (Office of the Registrar General and Census Commissioner, 2006). The proportion of population in the working-age bracket of 15-59 years will increase from 57.7% in 2001 to 64.3% in 2026. India's present population is young, 54% of the population is aged 24 years and less as per Census 2001 (Teamlease Services, 2008). The 15-24 age-group accounted for 19% of the population in 2001 i.e., 195 million people. While the share will drop to 16% in 2026, in absolute terms, the number of people in the 15-24 age group will increase to 240 million in 2011 and then decline a bit to 224 million in 2026. Between 2001 and 2026, the total population will increase by 371 million and 83% of the increase

will occur in the age-group of 15-59 years. The points about a young population, declining dependency ratios and demographic transition are obvious enough and are variously referred to as India's demographic dividend (ibid).

It is estimated that in India the largest number of new jobs will be created in the service sector, adding some 120 million jobs by the year 2020. Decline in employment growth in agriculture has been sharper than in other major sectors because the labour productivity differential has increased steadily over time between the agriculture and non-agriculture sectors (industry and services) (Bhaduri, 2008). The most promising sectors would include financing, insurance, education, health, construction and real estate, advertising, printing, and packaging. The twenty high priority sectors identified by the Planning Commission are given in table 1. These sectors have witnessed much higher growth in recent times than the average growth. As international studies suggest, some 80-90 % of the developed countries economic growth has been determined by knowledge creation and dissemination. Despite fairly healthy GDP growth, employment in the organized sector actually declined, leading to frustration among the educated youth who have rising expectations (Planning Commission, 2008). Though the aggregate employment generation of 47 million work opportunities in the period 1999-2000 to 2004-05 was fairly close to the target of 50 million employment opportunities for the Tenth Plan, the performance across sectors has varied. The rate of unemployment has increased from 6.1% in 1993-94 to 7.3% in 1999-2000, and further to 8.3% in 2004-05 (ibid). The increase in employment growth rate in the latest NSS round has largely been attributed to the increase in self-employment. In addition, the increasing returns to secondary education point to the general scarcity of skills at that level while high unemployment of educated labour points to a possible mismatch between the skills of the labour force with tertiary education and the skills demanded by the market (World Bank, 2006).

Table 1: High priority sectors

1. Automobile and Auto-components	11. Health Care Services
2. Banking/ Insurance and Finance Services	12. ITES or Business (BPO) Process Outsourcing
3. Building and Construction Industry	13. IT or Software Services/ Products
4. Chemicals and Pharmaceuticals	14. Leather and Leather Goods
5. Construction Materials/ Building Hardware	15. Media, Entertainment, Broadcasting, Content Creation and Animation
6. Educational and Skill Development Services	16. Organised Retail
7. Electronics Hardware	17. Real Estate Services
8. Food Processing/ Cold Chain/Refrigeration	18. Textiles, Apparel and Garments
9. Furniture and Furnishings	19. Tourism, Hospitality and Travel Trade
10. Gems and Jewellery	20. Transportation Logistics, Warehousing and Packaging

3.0 Demographic Advantage

The majority of the developed economies is either bogged down due to substantial amount of debt that they need to pay off or weighted down by the elderly populations who are weakening the economic growth and leading to export dependence. By 2050, the European countries, Japan, Russia and China will face the most immediate impact of ageing with more than 15% of the population aged over 60 years (Gayondato and Kim, 2009). Furthermore by 2050 the rate of increase in the share of the population aged 60 + is projected to be the highest among more developed countries (34%) and lowest among least developed countries (17%) (United Nations,2003). It is said that by 2020, the average Indian will be 29 years old, as compared with 37 years in China and the US, 45 in West Europe and 48 in Japan (Chandrasekhar *et al.*, 2006).The ageing of the population will have economic implications as the employable population will reduce in relative terms because of insufficient members of young people to support the economy. On the other hand, developing countries like India, with 50 percent people in the average age of 25 years and below, are emerging as a 'young nation'. The population increase between 2000 and 2020 is estimated at 320 million and 87 percent of the total population will be in the age cohort of 16 to 64 years. India enjoys the demographic advantage of an increasing young population. India is now seen as a vast pool of talent with great diversity and demographic advantage.

4.0 Requirement of Skilled Human Resource

India aspires to become the world's largest pool of skilled human resource and professional workforce. PM's Council on National Skill Development has set a target of creating 500 million skilled people by 2022 with emphasis on inclusivity so as to deal with divides of gender, rural/urban, organized/unorganized, employment and traditional/contemporary workplace (Planning Commission, 2009a). It has laid down the core governing principles and operating strategies for skill development. Some of the key governance principles for skill development strategy include designing of programmes under which the learner can pay the skill provider directly, skills are fungible and bankable, and individuals are enabled to convert their knowledge and skills through adequate testing and certification into higher diplomas and degrees. The emphasis is on promoting multiple models of delivery that can respond to differing situations in various States and to utilize existing available infrastructure of educational institutions for skill development after school hours without affecting formal education (ibid).

The overall capacity created in the country to equip the human resource is grossly insufficient if the target of preparing 500 million skilled persons by 2022 is to be realised. The NSSO 61st Round results show that among persons of age 15–29 years, only about 2% are reported to have received formal vocational training and another 8% reported to have received non-formal vocational training indicating that very few young person's actually enter the world of work with any kind of formal vocational training (Planning Commission, 2008). This proportion of trained youth is one of the lowest in the world. The corresponding figures for industrialized countries are much higher, varying between 60% and 96% of the youth in the age group of 20–24 years (ibid). One reason for this poor performance is the near exclusive reliance upon a few training courses with long duration

(2 to 3 years) covering around 100 skills. 80% of new entrants into the work force have no opportunity for training in skills. 12.8 million youth will enter the work force as new entrants per year. As against this, the present (largely government-administered) system of delivery can only provide training to 3.1 million per year (Teamlease Services, 2008). The Central Ministries must focus on areas where private investment in skilled development is unlikely to be available and the Government should aim for useful Public-Private Partnerships (PPP) in skill development (ibid).

India has acquired substantial experience in implementing Technical Vocational Education and Training (TVET) for over four decades. In the post liberalization era, the country has already capitalized on its vast pool of educated English speaking population to become a major power in Business Process Outsourcing, Information Technology, Financial and Biomedical Technology, Banking, Insurance, and Construction and Real Estate development. In the process, in-depth insights have been acquired on various crucial aspects of planning, implementing and reforming TVET in the backdrop of socio-cultural demands and economic changes. These have to be fully utilised and concrete steps have to be taken briskly to achieve the desired goals as the knowledge and skills of the national human resource will be major determinants of the future economic growth. To streamline the implementation of various skill development initiatives, a National Policy on Skill Development has been formulated in 2009. The salient features of the policy are:

- (i) Demand driven system guided by labour market signals thereby reducing skills mismatch.
- (ii) Expansion of outreach using established as well as innovative approaches.
- (iii) National Vocational Qualifications Framework (NVQF) which inter-alia includes opportunities for horizontal and vertical mobility between general and technical education, recognition and certification of competencies irrespective of mode of learning.
- (iv) System to deliver 'competencies' in line with nationally and internationally recognized standards.
- (v) Focus on new emerging occupations.
- (vi) Focus on pre-employment training and lifelong learning.
- (vii) Equity consideration – adequate participation of women, disabled persons and disadvantaged groups including economically backward and minorities – enhancing their access to training; improving employability and increasing employment opportunities.
- (viii) Stress on research, planning and monitoring.
- (ix) Involvement of social partners – responsibility for management and financing of the system would be shared with all stakeholders and provide greater space for Public-Private Partnership.
- (x) Promoting excellence.
- (xi) Use of modern training technologies including distance learning, e-learning, web-based learning, etc.
- (xii) Skill upgradation of trainers, their quality assurance, and improvement of status.

A large part of population is virtually unemployable due to the lack of requisite skill sets. For instance, the surplus labour from agriculture is potentially unemployable in the

manufacturing sector and a large part of the services sector due to lack of skills (Planning Commission, 2009b). On the other hand the availability of a large workforce is inconsistent with emerging formal and sophisticated work environment. The quality of most graduates is poor and employers offer very little upgrading of skills; only 16 percent of Indian manufacturers offer in-service training compared to over 90 percent in China (World Bank, 2010). The informal sector employs over 90 per cent of the workforce, but there is little investment or opportunity for formal "Skilling" for informal workers and enterprises (ibid).

To meet the skills demand of the Industry and to realize the objectives of the National Policy on Skills Development, it is imperative to create a system of education and training which could impart skills to the young and ageing population for an inclusive and sustainable economic growth. Approaching inclusive growth through skill development will require extending the reach of the VET system and improving the access to skill training for all (Planning Commission, 2006). Besides quantity, the quality assurance aspects in terms of providing better teaching-learning opportunities in VET are absolutely critical. In this context, the terms of reference of the present sub-committee assume importance dealing with crucial issues of curriculum development and reforms. A review of some of the economic sectors reflect on the issues that need to be addressed for bringing about necessary reforms in curriculum planning, design and implementation.

4.1 Information Technology Sector

Information Technology (IT) and Information Technology enabled Services (ITeS) are the biggest employment generator and has hired a workforce of about 1.63 million in 2007. According to the NASSCOM-McKinsey Report (2005) the India's economic growth will be greatly accelerated if the India-based IT industry and BPO industries sustain their global leadership and are able to generate approx. Rs 2,770 billion in export revenues by 2010. The Indian IT-BPO industry grew by 12 per cent in 2008-09 to reach Rs 3,312 billion in aggregate revenue. (IBEF, 2010). If trends are to be believed, it would continue to hire most aggressively. This translates to an estimated demand for 850,000 IT professionals and 1.4 million ITES-BPO personnel by 2010. If current trends in graduate turnout and employment are maintained, India will be well positioned to meet the demand for IT resources. However, sustaining India's disproportionately high share in the ITES-BPO segment will require the industry to attract an additional 500,000 employees—over the figures estimated if current trends in graduate out-turn and employment are maintained (NASSCOM, 2006).

It is estimated that only 13 per cent of the potential talent supply in low wage nations is suitable to work for multinational companies and there are 3 main reasons for this: (i) the lack of language skills, (ii) the limited capacity of the education systems of the off shoring hosts to impart practical skills, and (iii) the lack of cultural fit (The Indian Institute of Public Opinion, 2009). IT-ITeS companies will have to work to build a base of skilled professionals that can be immediately used by the industries. National Association of Software and Service Companies (NASSCOM) is working closely with the academia to encourage and facilitate greater industry interaction and bring about changes and standardization in the curriculum and pedagogy. The association is working with University Grants Commission (UGC) to jointly focus on faculty development initiatives, improve the

student and faculty interface and establish Techno-Business Skills Development Centers (ibid).

4.2 BPO (Business Process Outsourcing)

Business Process Outsourcing (BPO) is the delegation of one or more IT-intensive business processes to an external provider that in turn owns, administers and manages the selected process based on defined and measurable performance criteria. BPO is one of the fastest growing segments of the ITeS industry. Global sourcing of technology related services in 2007 stood at Rs 2,418 billion - 2,625 billion, a rise of about 30% on the previous year, according to National Association of Software and Service Companies, the trade body for the Indian outsourcing industry. BPO is a Rs 439 billion industry and is likely to employ close to 230,000 people by 2010. This sector also faces similar problems as that in IT sector, which include lack of proficient people in English and life skills.

4.3 KPO (Knowledge Process Outsourcing)

Knowledge process outsourcing (KPO) is referred to as a form of outsourcing whereby the knowledge related work is performed in an organization or by a division of the same organization, which may be in the same country or in an offshore location to save the cost. In contrast to the outsourcing of production or manufacturing, KPO has specific focus on knowledge expertise and high-value knowledge based work. Following the BPO success in India, the global companies are increasing their presence in KPOs. KPO industry now at Rs 139 billion and is expected to touch Rs 462- 554 billion by 2010. In this sector professionals are sought for financial analysis, equity research, treasury operations, credit decision processes and accruals services among others. It is estimated that there will be requirement of 2,50,000 persons. Legal Process Outsourcing (LPO), though at a nascent stage, is expected to grow fast due to a significant cost advantage in India. It would generate about 79,000 jobs by 2015. The processes being outsourced under LPO include patent application drafting, legal research, pre-litigation documentation, advising clients, analyzing drafted documents, writing software licensing agreements and drafting distribution agreement. Lack of nationally recognized skill standards and absence of provisions of vertical mobility has restricted the growth of individuals in the sector.

4.4 Retail Sector

The retail market in India was largely unorganized; however with changing consumer preferences, organized retail is gradually becoming popular, especially in big cities. Retail sector is expected to churn maximum number of job opportunities among upcoming fields after IT/ITES. Organized retail in India is expected to grow 25-30 per cent yearly and is expected to increase from Rs 35,000 crore in 2004-05 to Rs 109,000 crore by 2010. According to Government of India estimate the retail sector is likely to grow to a value of Rs. 2,00,000 crore and could yield 10 to 15 million retail jobs in the coming five years; currently this industry employs 8% of the working population. Industry experts predict that the next phase of growth in the retail sector will emerge from the rural markets. By 2012 the rural retail market is projected to have a total of more than 50 per cent market

share. The total number of shopping malls is expected to expand at a compound annual growth rate of over 18.9 per cent by 2015 (Business.MapsofIndia.com). The Retailers Association of India (RAI) is actively engaged in promoting retail business and linking retail training schools and universities.

4.5 Hospitality

Hospitality Sector include service industries like service apartments, hotels, restaurants, catering and canteen services, health care, Ayurveda and spa centers, and café's, clubs. With business travel increasing at a rapid pace, the hospitality sector would need a fresh workforce of at least 94,000 by 2010. Human Resource Managers are seeking graduates from home science, commerce, physics and engineering to plug the skill gaps and anticipated demand for trained workers. These personnel are required for managing food and beverage, house-keeping, front office and customer care. The Indian Association of Tour Operators (IATO) is promoting the travel and tourism in various ways, which include road shows in various countries to project India as destination for holidaymakers and attract tourists.

4.6 Entertainment

Indian music industry and the expanding outreach of FM radio are leading to expansion of the entertainment sector. Besides, content creating firms for television have grown manifold. The animation industry has grown by over 30% on a yearly basis in the last three years and has a promising future. Most of the training in the animation industry is being given by the private education and training institutions, as a result there is lot of variation in curriculum and limited scope for vertical mobility. A few Government aided institutions like Centre for Development of Advanced Computing (CDAC) are offering courses leading to post graduate diploma in animation and multimedia. The entertainment sector will need around 300,000 professionals.

4.7 Aviation Sector

Aviation sector in the country is growing at a whopping 25% per annum, creating a large chunk of jobs. There is presently a shortage of trained pilots. The industry is expected to add 130 airliners to the current fleet of 270 airliners, which would in turn push up manpower demand for flight dispatchers, cabin crew, airline managers, airport managers and ground handling personnel.

4.8 Construction Sector

The construction sector in India is the second largest economic activity after agriculture and provides direct or indirect employment, mostly in the unorganized sector. Construction sector can be broadly classified into 2 segments: (i) Real Estate (Residential, Commercial, Corporate, Industrial, and SEZs), and (ii) Infrastructure (Transportation, Urban development, Utilities, and Communication). The construction sector comprises various sub-industries like cement, steel, chemicals, paints, tiles, fixtures and fittings. The industry

supports 32 upstream industries and 72 downstream industries. Investment into this sector could go up to Rs 5,327 billion by FY 2010. Real Estate is a Rs 453 billion (by revenue) Industry in India. It is projected to grow to Rs 1,927 billion by 2010.

In 2007, around 37 million people were employed in the industry and this number is expected to be around 48 million by 2015, creating jobs for around 15 million people. Only around 1 million people are employed in the organized sector (CII, 2008). The Construction Industry Development Council (CIDC) was established by the Planning Commission and the Construction Industry. CIDC undertakes training and certification of construction workers and supervisors. The CIDC has established 19 institutes in the country for training and certification of construction workers in various trades. The National Academy of Construction (NAC) is running various training programmes and courses for preparing technicians and supervisors. The Indian Plumbing Association (IPA) has established Indian Institute of Plumbing (IIP) for preparing multi-levels of technicians and professionals for the plumbing industry. As a step forward towards standardizing skills and practices in plumbing, the International Association of Plumbing and Mechanical Officials – India (IAPMO-I), with the guidance from IPA and IIP has designed and developed a comprehensive Uniform Plumbing Code-India for assuring safe and hygienic plumbing practices.

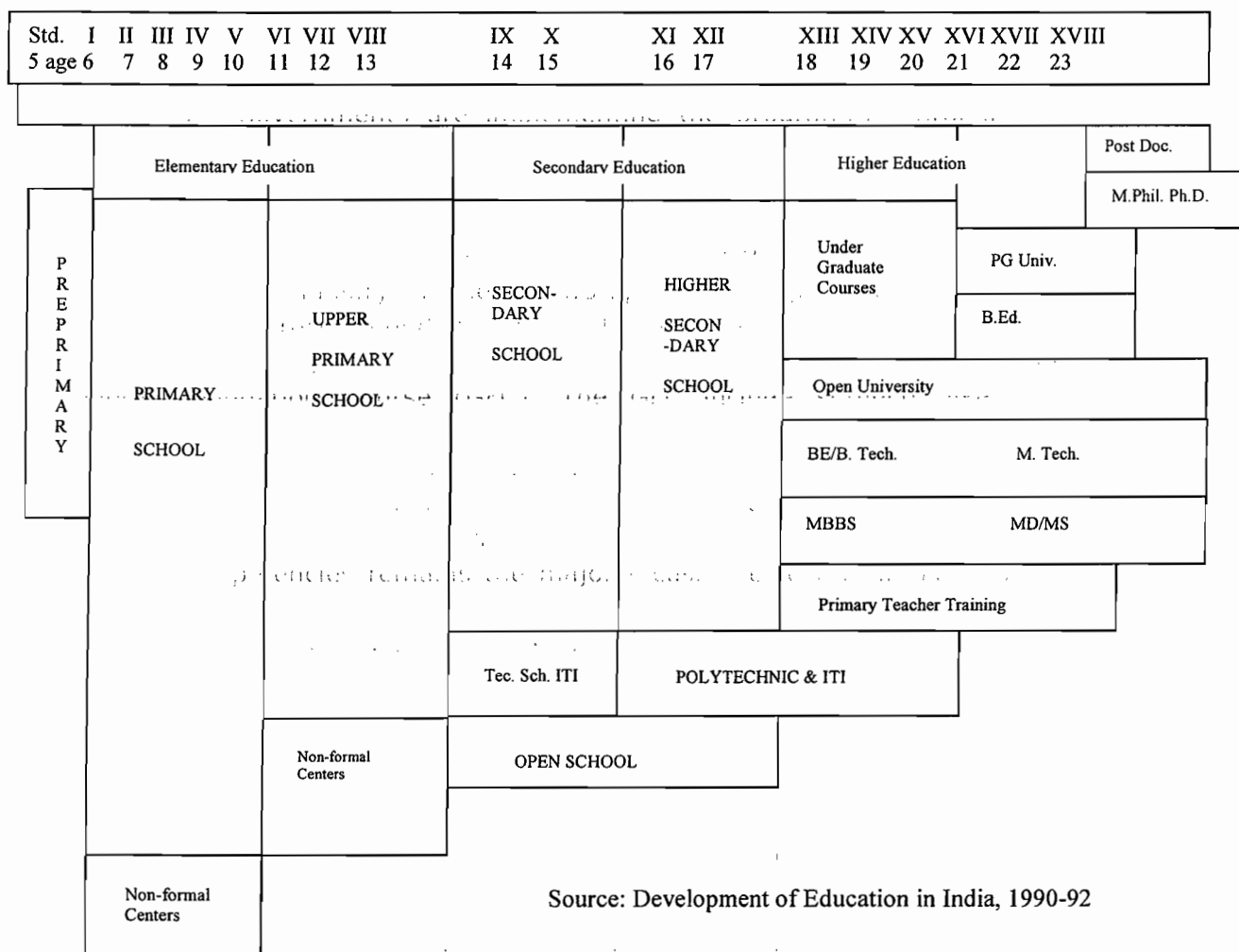
5.0 Present Education and Training System

The present education system in India comprises primary education, secondary education, higher secondary education and higher education (Fig.1). The elementary stage consists of eight years of education. Each of the secondary and higher secondary stage consists of two years of education. There are two streams at the higher secondary stage (10+2 level) namely, general academic and vocational education. Higher education starts after the completion of higher secondary education. Depending on the stream, graduation can take three to five years. Post graduate courses are generally of two to three years of duration. After completing post graduation, scope for doing research in various educational institutes also remains open.

5.1 Vocational Education Programme

The Vocational Education Programme offered at higher secondary stage in schools (after 10 years of school education) was introduced as part of the national curriculum with the goal to prepare students for the 'world of work' and to reduce the mismatch between the demand and supply of skilled manpower. The programme of vocational education at +2 level is under the aegis of Ministry of Human Resource Development (MHRD). The Centrally Sponsored Scheme of Vocationalisation of Secondary Education introduced in 1988 has created a massive infrastructure of 21,000 sections in 9690 schools, thus creating a total training capacity for 10 lakh students, with an annual intake capacity of 5 lakh students (MHRD, 2009). More than 150 courses are offered in six major disciplines, namely agriculture, business and commerce, engineering and technology, health and paramedical, home science, and humanities. The course terminates after two years, leading to a senior secondary level certificate.

The State Governments are implementing the programme through about 6800 schools. At present, about 4 lakh students are enrolled in VEP at 10+2 level. Most of these schools are government schools although in some states private schools are offering these courses. Most of the courses are being run through a collaborative model i.e., the theory part and some basic skills are developed in school and the specialized or technical skills are developed in the industry (at the real workplace) through On-the-Job Training (OJT). The course structure recommended at the national level includes 70% of the instruction time to be devoted to the chosen vocation and 30% to be divided between language and the General Foundation Course (GFC). The GFC include subjects like Environment Education, Rural Development, Entrepreneurship Development and Information and Communication Technology. State level variations exist as regard to the national recommendation of the curriculum structure. The instruction time of the course study is divided between theory and practical according to the need of the vocation, however, inculcation of competencies remains the major focus. The technical skills can be further reinforced through one year apprenticeship training available after the completion of the vocational course; however, not all the vocational students get this opportunity.



Source: Development of Education in India, 1990-92

----- Compulsory Education -----

Fig. 1: Structure of Education in India

According to the Seventh All India School Education Survey (7th AISES) of NCERT only 12.4% (5437) of higher secondary schools are offering vocational courses which are availed by only 5.4% of all students enrolled at the +2 stage. Constraints in the availability of funds, lack of adequate infrastructure and trained teachers/trainers and the absence of link between the curriculum and labour market requirements have adversely affected the overall growth of the programme at the national level. The overall picture is somewhat better in Kerala, Tamil Nadu, Karnataka, Maharashtra, Andhra Pradesh and Uttar Pradesh. The National Curriculum Framework-2005 (NCF-2005) has suggested that the VET curriculum should be reviewed and updated from time to time if the Vocational Education Programme is not to become moribund and irrelevant to the vocations and livelihoods in a given area or region (NCERT, 2005). The NCF-2005 has also proposed that there is a need to move in a phased manner towards a new programme of vocational education and training, which is conceived and implemented in a mission mode involving the establishment of separate VET centres and institutions from the level of village clusters and blocks to sub-divisional/district towns and metropolitan areas. Where ever possible, it would be in the national interest to utilize the school infrastructure (often utilized for only part of the day) for setting up this new institutional structure for VET. Such VET centres/institutions also need to be evolved in collaboration with the nation wide spectrum of facilities already existing in this sector.

Some options of continuing vocational education exist for the passouts of vocational education at +2 level, leading to diploma and in very few cases to degree in Commerce, Home Science, Agriculture and Humanities. This opens a vertical path for them, leading to academic higher education. If the success of VET systems is measured according to the proportion of young people who obtain a school learning certificate that gives them access to higher education and the proportion of university students, then Australia, Finland, Sweden, Poland, Hungary and Norway are at the top of the ranking with a proportion of students entering higher education of between 60 and 75% (Rauner, 2007). By contrast Switzerland, Germany and Austria are at the bottom of with figures hardly reaching 30% (ibid).

The University Grants Commission (UGC) introduced Career-Oriented Programme at the first degree level in Universities and Colleges in 1994-95. Under the scheme, vocational electives are offered with the focus on development of skills required for the job and self-employment. The career-oriented courses are added on courses offered along with the courses for conventional degree of B.A., B.Com. and B.Sc. On completion of the course, the students are given a Certificate/Diploma/Advanced Diploma along with the conventional degree in Arts/Commerce/Science.

5.2 Vocational Training Programmes

Development and co-ordination of the vocational training programmes in different sectors is the responsibility of the Ministry of Labour and Employment (MoL&E). Under the Ministry, the Director General of Employment and Training (DGE&T) covers training services for all categories of jobs through its country wide network of Industrial Training Institutes/ Centres (ITIs/ ITCs). The ITIs and ITCs are training over one million persons every year. The DGE & T is the nodal department for formulating policies, laying down standards, conducting trade testing and providing certification in the field of vocational

training. The concerned State Government departments are responsible for implementing the vocational training programmes and administration of ITIs. The ITI training programmes are decided by the State Directorate of Technical Education and Industrial Training. The two major training schemes are the Craftsmen Training Scheme and the Apprenticeship Training Scheme, both provide pre-employment training.

Industrial Training Institutes (ITIs) operate Craftsmen Training Scheme as one of the two main training schemes. 6906 Industrial Training Institutes/ Centres (ITIs/ ITCs) are functioning all over the country having intake capacity of 9.53 lakh to impart training in 110 trades (DGE&T, 2009). Courses offered by these institutes are structured and have a defined curriculum. About 70% of the training period is allotted to practical training and the rest to subjects relating to trade theory, workshop calculation and science, engineering drawing and social studies. The social study subject includes Information Technology Primer, Environmental Science and Family Welfare. The duration varies from 6 months to 3 years with 8 hours of training/teaching on each working day. The entry eligibility is 10th pass or in few cases 12th Class pass. Some courses are open to those who are 8th Class pass. Successful trainees are awarded with National Trade Certificate (NTC) which is a recognized qualification for recruitment in Central/ State government establishments. Some short-term courses of 2-8 weeks duration with flexible timing have also been developed. Details of the short courses offered in the various economic sectors is given in Annexure-I. Apart from ITIs/ ITCs, Craftsmen Training in 22 trades is also imparted through 6 Model Training Institutes (MTIs) attached to 5 Advanced Training Institutes (ATIs) and one Central Training Institute (CTI) under the DGE&T. Besides, one National Vocational Training Institute (NVTI) and 10 Regional Vocational Training Institutes (RVTIs) have also been imparting craftsmen training in women's occupations. Twenty Vocational Rehabilitation Centres (VRCs) for Handicapped have been functioning in the country, out of which, one Centre at Vadodara has been set up exclusively for women with disabilities.

The Apprenticeship Training Scheme under the Apprentices Act, 1961 makes it obligatory on the part of the employers, both in government and private sector establishments having requisite training structure to engage apprentices in 254 groups of industries covered in the Act. The training is being imparted in 188 trades (list available at website www.dget.gov.in). The entry qualification for Apprenticeship Training varies from 8th to 12th Class pass and the period of training varies from 6 months to 4 years depending upon the trade. The National Council of Vocational Training (NCVT) conducts All India Trade Tests (AITTs) twice a year and awards a National Apprenticeship Certificate which is recognized for employment under Government/Semi-government establishments. Besides this, there is a provision of training in 114 subject fields for Graduate & Technician Apprentices and 102 for Technician (Vocational) Apprentices. The Planning Commission's Sub-Committee on Re-modelling India's Apprenticeship Regime (Planning Commission, 2009c) examined the issues relating to remodeling of apprenticeship training and made specific recommendations for bringing about necessary reforms in administration, regulation, viability and marketing of apprenticeship training.

The Ministry of Labour and Employment has introduced a new strategic framework for skill development, namely Modular Employable Skills (MES) framework in close consultation with industry, State Governments and Experts. MES is 'Minimum Skills Set' which is sufficient to get an employment in the labour market. These can be learnt through professional training institutes or through professionals in formal and non-formal way for

ones gainful employment. MES allows skills upgradation, multi-skilling, multi-entry and exit, vertical mobility and life-long learning opportunities in a flexible manner. It also allows recognition of prior learning (certification of skills acquired informally) effectively. The courses under MES are available for persons having completed 5th Class. Testing of skills of trainees is being done by independent assessors/industry associations, which do not impart training.

The All India Council for Technical Education (AICTE) is a statutory body entrusted with the task of planning, co-ordinated development, quality assurance, monitoring and evaluation of technical education in India. Its mandate extends to managerial education, training and research at various levels (diploma, undergraduate, post graduate level). It covers a wide spectrum of areas such as Engineering and Technology, Computer Applications, Information Technology, Architecture and Town Planning, Management, Pharmacy, Applied Arts and Crafts, Hotel Management and Catering Technology, etc. The Council is also responsible for fostering industry linkages. The entry requirement for diploma in engineering and technology is a secondary certificate, i.e., 10th Class pass certificate and the duration is not less than 3 years, unless otherwise specified by the AICTE. There is a possibility of lateral entry of meritorious diploma students to the degree level, provided they have secured at least 60% marks in aggregate. Such students are considered academically equivalent to the student who has passed first year of the 4 year degree programme and thus, are allowed entry into the second year (third semester) directly. An additional 10% seats are reserved for such students and the admission is on the basis of merit in the entrance test and once admitted there is also provision of remedial courses as per the need. The entry requirement for degree programmes in engineering and technology is senior secondary, i.e., XII class pass certificate and the duration is 4 years. The overall picture of the Technical and Vocational Education and Training system with possible pathways for articulation is given in Figure 2. Polytechnics throughout the country contribute to the production of appropriate technical manpower such as technicians in different disciplines and emerging areas of technology. There are about 2324 polytechnics in India offering three years' Diploma Courses, after 10+ or 10+2, in a large number of conventional disciplines in Engineering/Technology/Pharmacy/Architecture as well as in areas of emerging and sunrise technology. The Polytechnics are basically state-level institutions and about 50 per cent of them are set up through private initiatives. A number of Polytechnics conduct Post-Diploma courses and Advanced Diploma courses for continuing education and career upgradation of technicians. The scheme of Community Polytechnics is in operation in selected diploma level institutions. It provides platform for transfer of appropriate technologies to rural masses/local communities through skill development programmes. All these programmes largely cater to the skilled manpower needs of the informal sector.

Besides the vocational education and vocational training programmes under MHRD and MoL&E respectively, there are several other VET programmes and activities under the purview of different Ministries/ Departments, which include Ministry of Health and Family Welfare, Ministry of Rural Development, Department of Women and Child Development, Ministry of Agriculture, Ministry of Micro, Small and Medium Enterprises, Ministry of Industry, Ministry of Rural Development, Ministry of Urban Employment and Poverty Alleviation, Ministry of Information Technology, Ministry of Tourism, Department of Small

Scale Industries, Khadi and Village Industry Commission, etc. The annual vocational training capacity of ministries/departments is given in table 2.

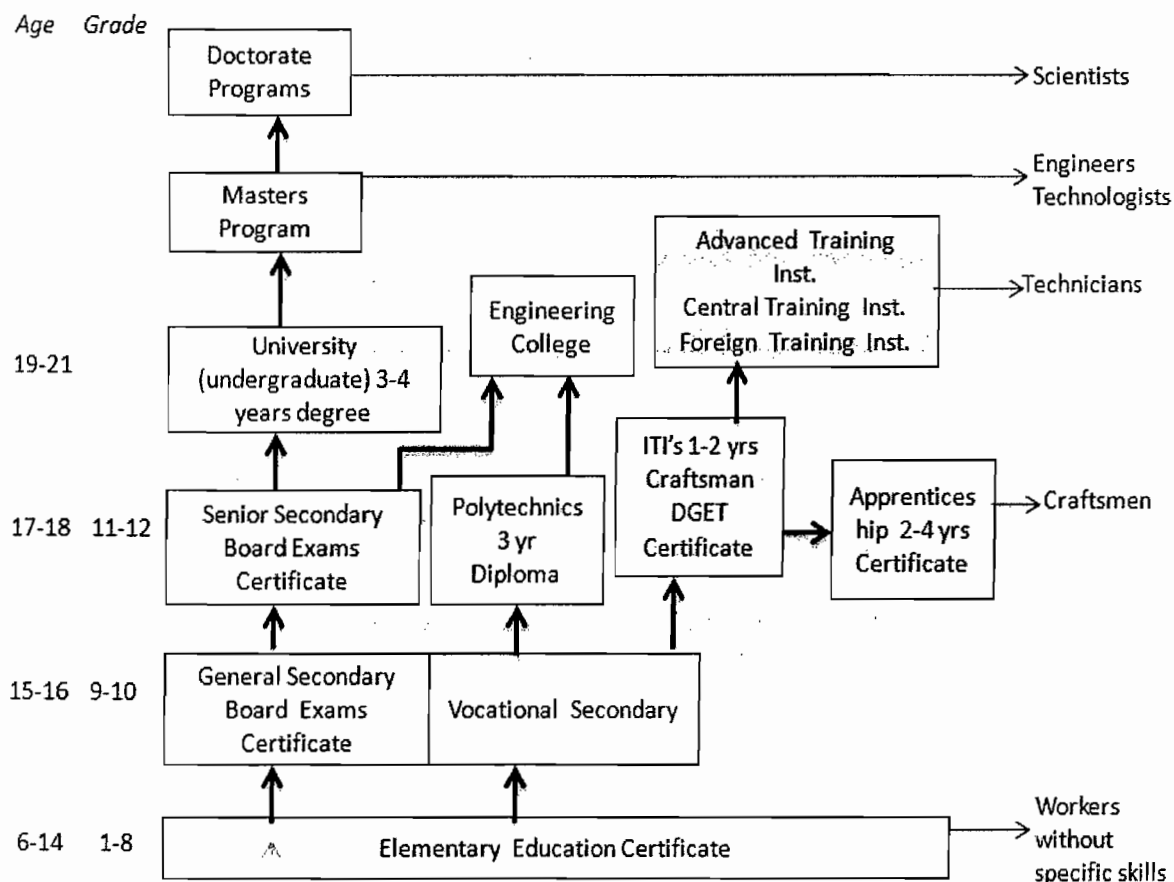


Fig. 2: Academic, Technical and Vocational Education Articulation in India

(Source: Skill development in India: The vocational education and training system report no.-22 World Bank)

Table 2: Annual vocational training capacity of ministries/departments in India

Ministry/Department	Estimated training capacity/persons trained (annually)
M/o Health and Family Welfare	0.20 lakh
M/o Human Resource Development	
(i) Vocationalization of Secondary Education	(i) 4.9 lakh (utilization is about 40%)
(ii) Apprenticeship training	(ii) 0.19 lakh
(iii) National Open School	(iii) 0.067 lakh
D/o Information Technology DOEACC 'O' level	0.75 lakh

M/o Labour (DGET) (i) Apprenticeship Training Scheme (ii) Craftsmen Training Scheme	(i) About 5.0 lakhs (ii) About 1.5 lakhs
Other long-term training programmes	0.07 lakh
D/o Small Scale Industries	0.02 lakh
D/o Tourism (Food Crafts Institutes)	0.011 lakh
Total	12.708 lakh

(Source: ILO (2003) Industrial Training Institutes of India: The Efficiency Study Report, Subregional Office for South Asia ILO, New Delhi)

6.0 Curriculum Development

The curriculum is helpful in guiding the kind of experiences that is to be provided to the students during the course of study. According to Doll (1989) a curriculum describes as "what is taught, how it is taught, teachers' materials, students' material, educational experiences, all people's experiences" combined into a rational whole. The current approaches to developing a modular curriculum (the intended curriculum) can only be partially successful if account is not also taken of both the pedagogy (the enacted curriculum) and the needs of learners (experienced curriculum) (Beven, 2009).

Reviewing or changing the curriculum is the re-planning of the breadth or scope of knowledge and skills. The improved, more effective outcomes bring about the required student learning in accordance with current expectations. The development and review of curricula is a complex exercise since it involves integration of not only the current educational and pedagogical needs of the subject area but also the anticipated needs arising out of the fast changing market scenario and skill standards.

6.1 Curriculum Design Phase

Curriculum design as a concept involves consideration of a whole spectrum of philosophical, pedagogical, social, administrative and personality development aspects, which contribute individually and cumulatively to the planning of an educational programme. Designing a whole curriculum is a very complex task. The intended curriculum, captured in content standards has to be organized and worked out in learning trajectories and educational activities. Designers have to work together as a team, building a shared view on learning and teaching. Practitioners should be involved in the design process. Essential employability skills, regardless of a student's programme or discipline, need to be a part of the curriculum as these are critical for success at the workplace. Some essential employability skills, which include communication, numeracy, critical thinking, problem solving, information management, team work and interpersonal skills should be linked to intended learning and assessment in each curriculum.

6.2 Curriculum Development Phase

The development of an effective curriculum is a multi-step, ongoing and cyclic process. The process progresses from evaluating the existing initiatives to designing a programme, implementing it and evaluating leading to a revised design of the programme, thus the process continues. The first step after the need assessment is to identify the core part of the curriculum which embodies scientific and technological knowledge basic to the profession. To this core, the other ingredients of professional knowledge and work are added in different proportions. With a proper balancing of the core, specialized and elective elements and suitable integration of meaningful practical and field exercises, the curriculum can not only provide the students with relevant professional knowledge, but also develop in them the capacity to tackle unknown problems and acquire sound professional ethics.

Curriculum development is a specialized task, which requires professional expertise. According to Nomdo (1995) the objective model for curriculum development possesses four main stages, namely (i) Identifying the aims and objectives of the curriculum, (ii) Selecting topics to be learnt cumulatively, (iii) Organising and sequencing the content, and (iv) Evaluating the selected content.

A widespread approach for developing curriculum for vocational courses is DACUM (Developing A CurriculUM) by Robert Norton (1997). DACUM encompasses the description and/or the testing of a necessary job specific skill, as well as the required general skills, knowledge, behaviour, tools, and machines, necessary for coping with tasks, including development prospective, expected by the end of a teaching-learning process. DACUM mainly concentrates on current observable jobs and thus only covers part of the 'world of work'. This runs the risk of certain restrictive view with regard to current needs (Spöttl, 2009). Another approach is Competency Based Training (CBT). This approach further developed in the USA, Australia, England and Scotland (Blanks, 1982) has been transferred to many countries under different names such as (i) Competency based instructions; (ii) Competency based on education; (iii) Performance based on education and systems approach to education (Adam *et al.* 1999).

6.3 Curriculum Implementation Phase

The curriculum is disseminated for implementation and its effective communication with the teachers/trainers makes it useful.

6.4 Curriculum Evaluation Phase

It involves gathering information and making judgments or decisions based on the information collected, to determine how well the curriculum is performing. The result obtained from the evaluation is utilized for bringing about necessary improvements or changes in the curriculum document and/or the provision of resources or providing in-service training to the teachers/trainers.

7.0 Why Curriculum Reorientation?

The curriculum of any skill development programme should be guided by the job market opportunities in economic and social sectors or should be reoriented to prepare entrepreneurs. It should meet the demand of the expanding avenues generated by the changes in technology, agricultural practices, and marketing strategies. The big question that we need to ask first is "Whether the existing curricula offered at various levels are oriented towards the need of the job market or can fulfil the requirements for developing entrepreneurial capabilities in the learners? If no, then what kind of reorientation is needed to prepare curricula which could not only fulfil the market needs but also develop 'life skills' needed for making people employable? To cope with the emerging needs in the job market, a comprehensive review of the existing curricula and teaching-learning materials available for the skilled development programmes, both long term and short term, should be initiated at the national and state level to reorient the curricula to the needs of the job market and entrepreneurship development.

8.0 International Experiences

Competency Based Curriculum (CBC), which involves development of curriculum through a collection of data from various sources for task and job analysis is now the preferred choice in most of the countries. Many countries such as Australia, Canada, Chile, Denmark, Japan, Malaysia, the Netherlands, New Zealand, Philippines, United Kingdom, and the United States have taken specific steps to develop occupational and training standards, and some are beginning to develop cross-national approaches and benchmark national standards to international requirements. Some countries such as United Kingdom, New Zealand and Australia have established occupational analysis systems to define levels of skills within occupations. Occupational standards are essential link between workplace employment requirements and delivery of education and training. The work of CBC development by several Institutes, as part of the VET programme, in a country is not only expensive but also results in unequal quality. Keeping this in view, many countries have set up "Curriculum Development Centres" or "Qualification and Curriculum Authority" (Box 1) at the national, regional and state levels, which are responsible for developing model curricula for the courses, particularly in emerging areas, in accordance with the latest employment trends and methodologies and practices of curriculum development. The model competency based curricula are then to be supplied to the Education and Training Institutes for adoption or adaptation with modifications, if necessary. In Australia, the curriculum is provided in the form of a document that contains course outline, syllabus and training packages to ensure nationally consistent learning outcomes.

Box 1: Qualifications and Curriculum Authority of United Kingdom

The Qualifications and Curriculum Authority (QCA) in UK, which was formed on 1 October 1997 through a merger of the National Council for Vocational Qualifications (NCVQ) and the School Curriculum and Assessment Authority (SCAA) is an executive non-departmental public body of the Department for Children, Schools and Families in the UK.

In England, the QCA maintains and develops the national curriculum and associated assessments, tests and examinations, as well as accrediting qualifications in colleges and at work. They also regulate awarding bodies and exams to ensure they are fit for purpose. QCA oversees the work of the awarding bodies in England, to ensure that their administration, marking and awarding procedures run smoothly. The QCA also has responsibility for vocational qualifications in Northern Ireland. Education and qualifications in other parts of the United Kingdom are the responsibility of devolved governments and agencies. In Scotland, for example, the Scottish Qualifications Authority is the responsible body.

QCA works closely with its main strategic partners, including the Department for Children, Schools and Families (DCSF), the Office for Standards in Education (Ofsted), the Adult Learning Inspectorate (ALI), employers' organisations, the Training and Development Agency for Schools (TDA), the Learning and Skills Council (LSC), the General Teaching Council for England (GTCE) and the Sector Skills Councils (SSC). QCA also collaborates with the other public qualification agencies in the UK: the Scottish Qualifications Authority (SQA), the Qualifications, Curriculum and Assessment Authority for Wales (ACCAC) and the Council for the Curriculum, Examinations and Assessment in Northern Ireland (CCEA). In April 2004, QCA launched the National Assessment Agency (NAA) to take over its role in the delivery and administration of National curriculum assessments. However, on the recommendation of The Sutherland Enquiry the National Assessment Agency will be disbanded and its functions subsumed within the management structure of QCA.

9.0 National Scenario

9.1 Curriculum Development for +2 Vocational Education Programme

At the national level, competency based curricula for 10+2 vocational courses are prepared by the PSS Central Institute of Vocational Education (PSSCIVE), a constituent of NCERT located at Bhopal. This is done by a committee of experts in the relevant area drawn from all over India, representing industry associations, teaching/training institutions, entrepreneurs, practicing teachers, etc. The need for a particular course is assessed through national level reports, demands from the states and the curriculum is developed in a working group meeting of experts in the subject field. The tasks required to be

performed by the trained persons are identified and analysed and based on the task analysis, curriculum is prepared. The relevant knowledge and skills needed to perform the specified task well are then identified and utilized for developing the syllabus. PSSCIVE has so far developed more than 100 curricula in important economy sectors. These curricula are made available to the States/UTs, who either adopt or adapt them. There is no regulatory mechanism at the National and State level to monitor the standards of the curricula. Curricula are revised from time to time by the PSSCIVE and also by the States/UTs, but there is no specified period for revision. As a result curricula of some of the courses offered in the States/UTs are as old as 10 years.

9.2 Curriculum Development for Vocational Training Programme

The Central Staff Training and Research Institute (CSTARI) at Kolkata has been assigned the responsibility for preparation of draft curricula and their revision from time to time for the curricula of craftsmen training scheme (CTS) and modular employable skills (MES) scheme. The DGE&T's Curriculum Development Section coordinates the work related to development and revision of curricula. It scrutinizes draft curricula and obtains approval of the National Council for Vocational Training (NCVT). The periodicity of revisions depends on the technological changes taking place in industry in each particular trade. Generally, the introduction or revision of curriculum is based on recommendations made by NCVT. This work is done in consultation with relevant trade committees whose members are drawn from industry, technical institutions and DGE&T institutes.

9.3 Curriculum Development for Technical Education

The AICTE has initiated a programme to upgrade the syllabi for under-graduate education in technical institutions. An exercise to develop detailed curricula which will serve as a model for the institutions was taken up in pursuance of clause 10(I) of AICTE Act and with the objective of bringing about uniformity in the curriculum of engineering. The major QIP (Quality Improvement Programme) Centers are provided assistance to organize workshops for curriculum development. This leads to Model Curriculum, which is used as base document by many institutions. Since the inception of the QIP Scheme in 1970, Curriculum Development Cells (CDCs) have been set up for improving the effectiveness of technical education in the country by undertaking activities which include curriculum development and revision among others. The broad strategies for framing the curricula included the study and analysis of the existing curricula followed in various institutions within the country. The feedback received in various workshops involving faculty from different institutions are as follows:

- (i) The duration of a degree level course should be limited to 4 years/8 semesters of about 90 working days each.
- (ii) A common first year syllabus with sufficient emphasis on humanities and science and management subjects shall be adopted for all branches of engineering.
- (iii) The contact hours per week should normally be kept at about 30 hours.
- (iv) Weightage of 15 to 20% shall be given to non-professional (basic sciences and humanities) subjects and about 10% to management subjects.

- (v) Normally the curriculum should include a major project of minimum 8 credits in final year (2 credits in 7th semester and 6 credits in 8th semester). Emphasis should be given to industry sponsored projects.
- (vi) Wherever possible the students in 3rd and 4th year should be involved in group discussion on topics of current trends in engineering and technology.
- (vii) There should be a continuous evaluation system.

9.4 Curriculum Development for Undergraduate and Post Graduate Programmes

Universities are autonomous bodies and each has its own system of developing and revising curricula. They usually have specialised bodies e.g., Committee of Courses, represented by the concerned faculty members in the University and a few external members in or the related fields. Such committees, utilising the expertise of the committee members in the subject area, develop or revise the curriculum. This is then approved by the Academic Committee. Sometimes national level bodies, such as Indian Council for Agricultural Research (ICAR), University Grants Commission (UGC), etc. issue guidelines or exemplar curricula. The frequency of curriculum revision greatly varies from University to University; as a result there are wide variations in the standards and learning outcomes. Flexibility in terms of duration of course and curriculum is needed to allow learners respond to the changing skill demands.

9.5 Curriculum Development for Open Vocational Education and Training

The National Institute of Open Schooling (NIOS) is conducting vocational education programmes since 1993. At present, it is offering 70 vocational courses and it plans to expand its open vocational education programme to offer about 200 courses by the end of XI Plan. The target group of the NIOS vocational courses consists of persons belonging to the marginalized sections of society, rural youth, girls and women, the scheduled castes and the scheduled tribes. The NIOS courses are conducted in partnership with professional and technical agencies which are NGOs, government institutes, government supported agencies like ITIs, Jan Shikshan Sansthan, Krishi Vigyan Kendras, Schools, Colleges, District Institutes of Education and Training, Universities, Paramedical Training Centres, and several other voluntary agencies. In March 2009, NIOS had a total of 1106 Accredited Vocational Institutes (AVIs) spread across 28 states and 7 UTs. The NIOS course curriculum includes both theory and practical training. This is usually in the ratio of 30:70.

The Indira Gandhi National Open University (IGNOU) is offering vocational courses leading to certificate, advanced certificate, professional certificate, and degree qualifications through distance learning mode in areas like hospitality management, tourism studies, fashion design, fashion merchandising and production, business process outsourcing, security management, textile designing, air ticketing, travel agency operations, tour guiding skills, etc. The University has adopted an integrated multimedia instructional strategy consisting of printed materials and audio-video aids, supported by counselling sessions at a network of study centres throughout the country. It conducts both continuous evaluation as well as term-end examinations.

There are a number of providers in skill development who are catering to a variety of stakeholders through diversified vocational courses of different duration and levels in

each area. Further, a number of providers are also providing courses of same levels with the same entry qualifications and duration. Overlap is not only evident but at times imperative among the courses offered at levels of varying hierarchy. For example, vocational students of 10+2 vocational courses in Business and Commerce, Engineering and Technology, Garment/Fashion designing, Food processing etc., find a substantial overlap in the content when they register for higher degree/diploma level courses. In a number of cases, vocational passouts of +2 level VEP are not even considered as eligible for admission to the undergraduate programmes as they have not cleared general academic subjects like physics, chemistry and mathematics. This anomaly could be avoided to a great extent if modular credit based courses are available at various levels of education and training system.

There is an urgent need to address the issue of 'overlaps and voids' in curricula offered through the various Institutions so as to reduce the mismatch between the demand and supply of skilled manpower. The unorganized sector that employs up to 92 per cent of the national workforce and produces 60 per cent of GDP does not have a system of formal skill training. There are very few institutes in the country, which are offering courses for imparting skill training to the workforce employed in the unorganized sector. This can be very well demonstrated by an example from Gems and Jewellery Sector (Box 2). There is a gap in vertical and horizontal linkages between the courses offered in the sector. Institutes imparting skill training in the sector has different course duration and eligibility criteria for the same course. There is a need to create a regulatory skill council in Gems and Jewellery sector to remove the anomalies in the courses and provide vertical and horizontal linkages and opportunities for lifelong learning.

The curriculum has to be conceptualized on the basis of the learner's needs and it should encompass the four pillars of education i.e., (i) *Learning to know*: acknowledges that learners build their own knowledge daily, combining indigenous and 'external', elements, (ii) *Learning to do*: focuses on the practical application of what is learned, (iii) *Learning to live together*: addresses the critical skills for a life free from discrimination, where all have equal opportunity to develop themselves, their families and their communities, and (iv) *Learning to be*: emphasizes the skills needed for individuals to develop their full potential (Delors *et al.*, 1996). The National Policy on Skill Development advocates the concept of lifelong learning. Keeping this in view there is a need for developing curricula suited to the needs of lifelong learners at various age and with different qualifications. Universities and colleges should examine the qualifications of students admitted to different academic and vocational programmes to identify disparities in admission of 10+2 vocational passouts. The issue of equivalence of qualifications and horizontal and vertical linkages needs to be addressed, as suggested by the MHRD through the proposed National Vocational Qualification Framework for India.

Box 2: Overlaps and Gaps in entry requirement and duration of courses in Gems and Jewellery Sector – An Analysis

In Gems and Jewellery sector, NCVT has developed 19 courses under Modular Employable Skills (MES). Each course has different eligibility criteria and duration. Every module is an independent course. Three categories of courses are being offered by Gems and Jewellery Institute in the country: (i) Certificate Courses, (ii) Diploma Courses, and (iii) Post Graduate Diploma courses.

Anomaly exists in course duration and eligibility criteria. For example "Certificate in Gem identification" is a 1 month Certificate course offered by Gemological Institute of India, Mumbai. The same course "Certificate in Gem Identification" is a 2-5 month course in Gem Testing Laboratory, Jaipur. Similarly "Certificate in Diamond Grading" is a 12 week course in Indian Diamond Institute, Surat, Gujarat, whereas it is a 1 month course in Gemological Institute of India, Mumbai and 2 months course in ENSIGN – the Jewel Design Institute, Delhi and Indian Institute of Gemology, Delhi.

The entry qualifications for Certificate, Diploma, Masters Diploma are not different. The eligibility criterion for Diploma in Gemology is 10th Class pass or equivalent and the eligibility criteria for Masters Diploma in Gem Identification is also 10th Class pass or equivalent. Similarly the eligibility criterion for "Certificate in Diamond Grading" and also for "Diploma in Diamond Grading" is 12th Class pass. The Gem Testing Laboratory offers "Masters Diploma in Gem Identification" of 8-10 months duration. The eligibility criteria is Diploma in Gemology, whereas the same "Masters Diploma in Gem Identification" offered by Indian Diamond Institute, Surat requires graduation in any stream.

Transforming curriculum initiatives into practice requires identification of key issues that need to be addressed. The key curricular issues, summarized in Fig. 3 require attention for bringing about necessary reforms in curriculum planning, design and implementation for effective skill development programmes.

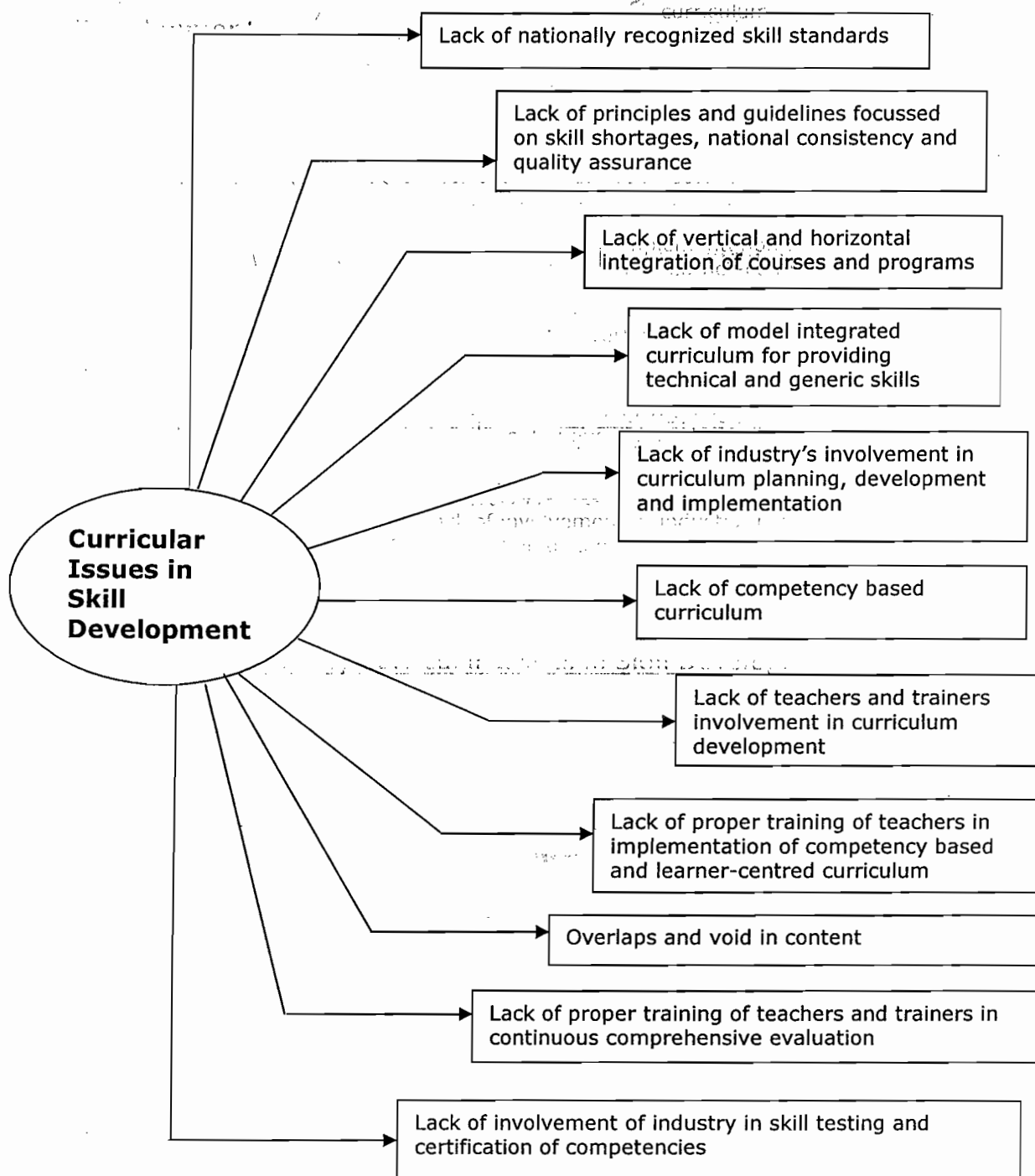


Fig.3: Key Curricular Issues in Skill Development

10.0 Recommendations

Recommendation 1: Establishing flexible learning pathways through National Vocational Qualification Framework

Variations exist presently in the vocational course curricula being followed in different States/UTs. There is need to harmonize the course curricula offered through different institutions to better facilitate exchange of students among the States and also among different providers. A demand driven multi-entry and multi-exit system of VET should be introduced to cater to the needs of a wide variety of learner groups. The delivery of VET programmes should be regulated through a credit based system, with due recognition to credits accumulated through the formal and non-formal system. This will also encourage learners to become life-long learners. Procedure for recognition of prior learning of the students entering the course should become part of the curriculum i.e., (a) What competencies students possess on entry into the course? , and (b) What competencies they will acquire on leaving the course? The difference between (a) and (b) is the gap that must be bridged when designing the curriculum.

The 'outcomes-based approach' to curriculum gives recognition to prior learning experiences. The curriculum should be re-orientated in a manner such that it serves as a 'technology transfer vehicle' with a broad range of knowledge, skills and activities related to the occupation. There should be a shift from content-based planning to skill-based planning of curricula to bring about necessary focus on outcome based teaching and learning.

The National Vocational Qualification Framework (NVQF) provides a common reference framework for linking various qualifications and setting common principles and guidelines for a nationally recognised qualification system. It is a unified system of national qualifications covering Schools, Vocational Education and Training Institutions and the Higher Education sector. It is useful in integrating education and training system, allows portability of skills across careers and geographical areas and encourages life-long learning. The proposed NVQF for India, as per the National Policy on Skill Development, will work as a guiding factor for development of guidelines and providing suitable vertical and horizontal mobility to the students. For example, in the existing arrangement, the vocational students (10+2 pass graduates) from the area of Engineering and Technology are given admission directly in the second year of the diploma level approved by AICTE. In some cases 5-10% seats are reserved for vocational students in undergraduate programmes.

Action

The task of curricular reforms can be coordinated by the National Skill Development Coordination Board (NSDCB) or National Skill Development Corporation (NSDC). Sector Skill Councils should be formed in collaboration with the Industry Associations such as Confederation of Indian Industry (CII), Federation of Indian Chambers of Commerce and Industry (FICCI), Associated Chambers of Commerce and Industry of India (ASSOCHAM), etc. The NSDCB or NSDC should be mandated for forming Sector Skill Councils. Sector Skill Councils can be hosted by the respective Ministries. Confederation of Indian Industry

(CII) has already constituted Sector Skills Councils which can be subsumed with the respective Ministries.

The Department of School Education, MHRD should be the nodal agency for development and implementation of NVQF. Development of NVQF should be done in consultation with all other stakeholders such as Ministry of Labour and Employment (MO E& L), Central Board of Secondary Education (CBSE), All-India Council for Technical Education (AICTE), Distance Education Council (DEC), Indian Council for Agriculture Research (ICAR), National Council of Educational Research and Training (NCERT), Bar Council of India (BCI), National Council for Teacher Education (NCTE), Rehabilitation Council of India (RCI), Medical Council of India (MCI), Pharmacy Council of India (PCI), Indian Nursing Council (INC), Dentist Council of India (DCI), Central Council of Homeopathy (CCH) and Central Council of Indian Medicine (CCIM), Construction Industry Development Council (CIDC), etc. to reduce the inherent voids in curriculum development and implementation so that the VET delivery system could operate more efficiently and effectively to achieve the common goal of skill development.

A mechanism may be developed for close collaboration between MHRD and the autonomous bodies working under it (such as NCERT, NCTE and NUEPA) and the Ministry of Labour and Employment (including DGE&T and NCVT) so that appropriate planning may be carried out in all areas of vocational education and training. Education and training institutions may establish articulation agreements to support mobility between courses and programmes. Such partnerships will ensure effective use of resources, avoid duplication and result in development of quality curriculum.

Recommendation 2: Identifying skill and learning needs and developing curriculum attuned to the needs of the employers and self-employment opportunities

The curricula for skill development programmes at various levels of education and training have been developed independently by the agencies because of differing broad institutional functions and goals. However, the ultimate objective is similar, aiming at helping the students to acquire generic and technical competencies to implement and manage various activities related to an occupation or an enterprise.

Skill need assessment and identification of voids is an agenda of continuous nature. In the present context, certain areas of voids can be identified, especially at the middle and the lower level. Based on the identification of the competencies required for each occupation and skill standards, competency based curriculum should be designed in such a way that recognition of prior learning becomes an integral part of the curriculum implementation. Sector Skill Councils should be assigned the responsibility of coordinating the work of development of skill standards and competency-based curricula in the respective sector. The SSC can be given statutory status for a specified time for quality assurance. MHRD through its established institutions e.g., PSSCIVE is capable of serving as the nodal agency to coordinate the work of the SSCs or the consortia. Duplication of efforts on aspects such as need identification, skill identification and standardization, curriculum development and reforms, needs to be avoided.

Staff Training and Research Institute (CSTRI), State Council of Educational Research and Training (SCERT), etc. should organize regular training programmes for the experts and teachers to empower them in competency-based curriculum development and implementation. Application of IT skills should also be promoted through these programmes.

Recommendation 6: Enhancing individual's employability and productivity through an integrated curriculum

The VET has to maintain close link with the labour market. The labour market is unstable and requires workers to face the changing labour situations throughout their life. In majority of the curricula, there is no indication of the specific competencies to be developed in the students. An integrated curriculum, comprising academic and workplace skills i.e., (i) generic or soft skills, which are more context-specific skills (including livelihood skills), and (ii) vocational skills should be developed. The integrated curriculum should aim to cover generic or life skills such as those required for effective communication at workplace (including proficiency in English), measuring with graduated devices, use of computers, civic, political and economic literacy, health, safety and hygiene, labour rights, consumer rights, working in team and personal financial management, which are necessary for preparing an individual for employment. While focusing on technical skills, students should be exposed to elements like value education, human rights education, gender-related issues, education for sustainable development, impact of global warming, education for democracy and peace, intellectual property rights, etc. Various models of integrated curriculum should be developed, which may include (i) incorporating more academic content in vocational courses, (ii) incorporating vocational component in academic courses to make the latter more relevant for the world of work, and (iii) aligning existing vocational and academic curricula to make them compatible with each other and to suit the needs of vertical and horizontal mobility.

Action

The NCERT and PSSCIVE should be mandated to develop a model integrated curriculum in each sector.

Recommendation 7: Involving Industry in skill assessment and certification

Effectiveness of skill development programmes should be measured through direct assessment of the skills and knowledge acquired. Skill standard-based curriculum and assessments provide students with credentials that link recognition with workplace requirement. Industries should, therefore, be involved in developing benchmark for assessments to evaluate skills, knowledge, and abilities in classrooms and on-the-job training or internships. There should be a shift from the use of standard conventional tools of assessment to the use of unconventional tools of assessment such as profiling, checklist, rating scales, etc. Industries should be involved in developing benchmarks for certificates of competence earned by students. Representatives from industries should

technological changes should be done on time. Every year there should be a mandatory review of curricula in consultation with the industry association.

participate in assessment and certification so that the skill development efforts are meaningful and responsive to the economy.

Action

Industry representation in skill assessment and certification should be ensured through Industry associations such as CII, FICCI, ASSOCHAM, etc. Sector Skill Councils can play an important role in promoting participation of industries in skill testing and joint certification. Working groups can be constituted by the SSCs to identify critical work functions, performance indicators and competencies based on skill standards that need to be assessed for certification. Certification of the competencies should include knowledge and skills gained through experience, training, and self-study.

Recommendation 8: Updating curricula regularly for developing the learner's ability to adapt to the changing technologies

The curricula should be evaluated and updated regularly hence suitable modifications keeping in view the technological changes should be done on time. Every year there should be a mandatory review of curricula in consultation with the industry association.

Action

The evaluation of curricula should be a time bound exercise. For example, every 3 year curricula should be evaluated and updated. The revision should be undertaken in collaboration with employers or industry partners and the information on the curriculum evaluation should be widely shared with the education/training institutions and industry partners.

11.0 The Way Forward

- (i) Comprehensive structural reforms are needed in skill development strategies, including curriculum development and reorientation to make VET programmes more effective and responsive.
- (ii) A broad common VET curriculum framework for each sector should be developed for exchange and mobility across and between the vocational education and academic education system.
- (iii) There is a need to develop short duration courses for the low-educated people who cannot afford training while earning. These courses should be modular in nature and offered through a flexible credit based system.
- (iv) A link between the formal and non-formal system of education should be fostered through modular courses. The National Qualification Vocational Framework can serve as a guide with ample space for contextualisation. This would, however, require constitution of specific working groups to undertake this specialised task.

SECTOR-WISE STRUCTURE OF SHORT DURATION COURSES

Sector 1: Gems and Jewellery

The Indian gems and jewellery industry is one of the fastest growing segments in the Indian economy with an annual growth rate of approximately 15%. According to an estimate made by the Gem and Jewellery Export Promotion Council (GJEPC), India's gem and jewellery exports posted a modest growth of 1.45 % during 2008-09 at US\$ 21.1 billion, primarily driven by gold jewellery exports, including medallions and ornaments. India is the largest diamond cutting and polishing centre in the world—the industry enjoys 60 % value share, 82 % carat share and 95 % share of the world market in terms of number of pieces. In other words, nearly 9 out of 10 diamonds sold worldwide are cut and polished in India. India exported cut and polished diamonds worth US\$ 14.18 billion in 2007-08. According to an ASSOCHAM report released in 2007, the gems and jewellery industry accounts for nearly 20 per cent of the total Indian exports and employs over 1.3 million people, directly or indirectly (IBEF, 2008a). The domestic market is estimated to be around US\$ 16.1 billion and the 'All India Gems and Jewellery Trade Federation', a nodal agency representing 300,000 jewellers across the country, expects it to grow to US\$ 25.2 billion in two to three years (Commodity Online, 2009). India is also emerging as the world's largest trading centre for gold targeting US\$ 16 billion by 2010. The industry has the best skilled manpower for designing and producing high volumes of exquisite jewellery at low labour costs. The Indian gems and jewellery market is largely unorganised. However, with the Indian consumer becoming more aware and quality conscious, branded jewellery is becoming very popular, and the market for branded jewellery is likely to be worth US\$ 2.2 billion by 2010, according to a McKinsey report.

Human Resource Development

The Indian Gems and Jewellery sector has large pool of skilled artisans with vast traditional knowledge and expertise in jewellery making. It also has the largest human resource pool on diamond cutting and processing. There are over 15,000 players in gold processing, and about 450,000 goldsmiths throughout the country. The industry is dominated by family jewellers who constitute nearly 96 percent of the market.

In Gems and Jewellery sector, NCVT has developed 19 courses under MES scheme (table 1). Each course has different eligibility criteria and duration. Every module is an independent course. These courses, however, do not lead to a higher qualification.

Various government and private institutions (table 2) are involved in providing training in gems and jewellery sector. Three kinds of courses are being offered by Gems and Jewellery Institute:

1. Certificate Courses
2. Diploma Courses
3. Post Graduate Diploma Courses

The courses are short duration courses ranging from one week to one year. The courses include training on design standards, quality control, identification of gems, stones, and precious metals, manufacturing processes, advanced techniques, design trends, colour schemes in jewellery, design themes, presentation and framing, design of jewellery pieces, men's jewellery, costume jewellery and jewellery costume.

Table 1: Courses in Gems and Jewellery Sector under the Modular Employable Skills (MES) scheme

S.No.	Name of the Modules	Entry Qualification	Duration (Hrs)
1.	Gem Cutting Assistant	8 th Std. pass	180
2.	Foundation Course for Jewellery	8 th Std. pass	120
3.	Rubber Mould Packing, Vulcanizing Mould Cutting, Course Wax Injection and Tree Making	8 th Std. Pass + Foundation Course for Jewellery	90
4.	Casting	8 th Std. Pass + Foundation Course for Jewellery	120
5.	Basic Stone Setting	8 th Std. Pass + Foundation Course for Jewellery	240
6.	Advance Stone Setting	8 th Std. Pass + Basic Stone Setting	360
7.	Pave Stone Setting	8 th Std. Pass + Basic Stone Setting	240
8.	Enamelling	8 th Std. Pass + Foundation Course for Jewellery	240
9.	Basic Metal Mould Making	8 th Std. Pass + Foundation Course for Jewellery	240
10.	Advanced Metal Mould Making	8 th Std. Pass + Basic Metal Mould Making	360
11.	Embossing	10 th Std. Pass + Foundation Course for Jewellery	360
12.	Finishing and Polishing of Jewellery Pieces	8 th Std. Pass + Foundation Course for Jewellery	120
13.	Manual Jewellery Designing	10 th Std. Pass + Foundation Course for Jewellery	120
14.	Jewellery CAD Design Using Rhinoceros	10 th Std. Pass + Computer Fundamentals, MS Office and Internet + Foundation Course for Jewellery	120
15.	Jewellery CAD Design Using Matrix 6	10 th Std. Pass + Jewellery CAD Design Using Rhinoceros	60
16.	Diamond Grading	12 th Std. Pass	60
17.	Cut Designing	12 th Std. Pass + Diamond Grading	60
18.	Cut Optimisation and Analysis	12 th Std. Pass + Cut Designing	60
19.	Jewellery in Organised Retail	10 th Std. Pass + Foundation Course for Jewellery	175

Table 2: Private Training Providers of Gems and Jewellery course

S. No.	Institution Name	Course Name	Eligibility	Duration
1.	Aastha Institute of Gemology, Pune	Certificate in Diamond Grading	10+2 or equivalent	5 weeks (62 instruction hrs)
		Gems Identification and Coloured Stones	10+2 or equivalent	5 weeks (62 instruction hrs)
2.	Arch Academy of Design, Jaipur	Certificate in Gem Identification	10+2	4 Month
		Certificate in Gem Processing	10+2	4 Month
		Diploma in Gemology	10+2	1 year
3.	Creations-the School of Design and Technology, Pune	Diploma in Diamond Grading	10+ 2	3 / 6 Months
4.	ENSIGN - the Jewel Design Institute, New Delhi	Certificate in Diamond Grading	10+2 or equivalent	2 Months, 5 Days a week
		Diploma in Gemology	10+2 or equivalent	1 semester
		Gems Identification and Colored Stones	10+2 or equivalent	3 Months, 5 Days a week
5.	Gem Testing Laboratory, Jaipur	Certificate in Gem Identification	10+2 or equivalent	2 to 5 months
		Diploma in Gemology	10+2 or equivalent	3 ½ months
		Masters Diploma in Gem Identification	Diploma in Gemmology	8 to 10 months
6.	Gemological Institute of India (G.I.I.), Mumbai	Certificate in Diamond Grading	10th or above	1 month
		Certificate in Gem Identification	10th or above	1 month
		Diploma in Diamond Grading	10+2	--
		Diploma in Gemology	10+2	--
7.	Gemstones Artisans Training School, Jaipur	Diploma in cutting and polishing of coloured gemstones		6 months
		Diploma in Gem Carving		6 months
8.	Global Jewellery and Gemological Institute, Surat	Certificate in Diamond Grading	10+2	12 Weeks
9.	Indian Diamond Institute, Surat	Certificate in Diamond Grading	SSC	12 weeks
		Certificate in Gem Identification	SSC	8 weeks
		Certificate in Stone Setting	SSC	4 weeks
		Diploma in Diamond Grading	Graduate or Equivalent	18 weeks

		Diploma in Diamond Sorting	Graduate or Equivalent	24 weeks
		Diploma in Gemology	HSC (12th) or Equivalent	16 weeks
		Masters Diploma in Gem Identification	Graduation in any Stream	36 weeks
10	Indian Institute of Gemology, Delhi	Certificate in Diamond Grading	10 th or above	2 months
		Gems Identification and Colored Stones Course	10 th or above	3 months
11.	Indian Institute of Gems and Jewellery, Mumbai	Certificate in Diamond Grading	H.S.C; Knowledge of English and an aptitude for art and design	8 weeks
		Certificate in Gem Identification	H.S.C; Knowledge of English and an aptitude for art and design	10 weeks
12.	Indian Institute of Jewellery, Mumbai	Diploma in Gemology	10th or equivalent	--
		Masters Diploma in Gem Identification	10th or equivalent	--
13.	International Gemological Institute, Mumbai	Gems Identification and Coloured Stones	10+2	4 weeks - 5 half-days/week
14.	International Gemological Laboratories and Institute, New Delhi	Certificate in Diamond Grading	10+2 or equivalent	1 week
		Diploma in Coloured Stones and Gem	10+2/ Higher Secondary/ Senior Secondary or equivalent examination	3 months
		Diploma in Diamond Grading	10+2/ Higher Secondary/ Senior Secondary or equivalent examination	1 and 1/2 month

		Gems Identification and Coloured Stones	10+2/ Higher Secondary/ Senior Secondary or equivalent examination from a recognized	1 week
15.	J.K. Diamonds Institute of Gems and Jewellery, Mumbai	Diploma in Gemology	9th pass	6 weeks or 15 days
16.	Gem Testing Laboratory, Jaipur	Masters Diploma in Gem Identification	Diploma in Gemmology	8 to 10 months
17.	Indian Diamond Institute, Surat	Masters Diploma in Gem Identification	Graduation in any Stream	36 weeks
18.	Indian Institute of Jewellery (I.I.J.), Mumbai	Masters Diploma in Gem Identification	10th or equivalent	

The institutions mentioned in the table 2 provide training in Gemology, Diamond Grading, Jewellery Designing, and Diamond Valuation. The Gem Testing Laboratory at Jaipur serves as the examination center for the Diploma examination in Gemmology (F.G.A.) on behalf of the Gemological Association and Gem Testing Laboratory of Great Britain. Gemological Institute of India (GII) is a project of the Gem and Jewellery Export Promotion Council (GJEPC) and Co-sponsored by Diamond Exporters' Association Limited, Bharat Diamond Bourse and Gem and Jewellery Exporters' Association. The Indian Institute of Gems and Jewellery (IIGJ) is a project of the Gem and Jewellery Export Promotion Council Sponsored by the Ministry of Commerce, Govt. of India and approved by All India Councils for Technical Education and Director of Technical Education, Maharashtra. Indian Diamond Institute, Surat is the institute in the field of Diamonds, Gems and Jewellery. The Indian Institute of Jewellery, offers education and training in Jewellery manufacturing, Designing, Gemology and Business on international standards. J. K. Diamonds Institute of Gems and Jewellery is a Government registered trust under Indian Society Act of 1860, providing high quality practical training in polished and rough diamonds, jewellery and gemology since 1989.

Sector 2: Automobile Industry

Automobiles have become an indispensable part of our lives, an extension of the human body that provides us faster and more convenient mobility every passing day. India is the 4th largest car market in Asia, after Japan, Korea and China. For commercial vehicles, the country holds 5th position in the world and it has the second largest market, after China for 2-wheelers. The Tractor segment is also making steady progress in India. On 29th January 2007, the Prime Minister released Automobile Plan 2006 -2016 to give a road map to Indian Automobile Industry. In 2008-09, the Automotive Industry has witnessed a modest growth of 3.0 per cent (GOI, UBES, 2008-09).

... sponsored by the ministry of commerce, Govt. of India

The Ministry of Heavy Industries has recently announced a 10-year mission plan (Automotive Mission Plan 2016) to make India a global hub for automotive industry. The turnover of the automobile sector in 2008-09 was Rs 2,18,966 crore and exports were at Rs 31,782 crore (GOI, UBES, 2008-09). The turnover and the exports of the automobile vehicle industry in 2008-09 was at Rs 1,42,646 crore and Rs 16,782 crore whereas for the automobile component industry this was at Rs 76,320 crore and Rs 15,000 crore (ibid). The percentage of exports to the total turnover for the automobile industry and the automobile components sector in value terms was 12 per cent and 19.7 per cent respectively.

It is estimated that the automobile industry generates direct and indirect employment for 10.5 million people (GOI, UBES, 2008-09). The Indian Auto Components Industry is expected to grow to US\$ 33-40 Billion, by 2015 from around US\$ 7 Billion (IBEF, 2008b). The size of the Indian automotive industry is expected to grow, at a rate of 13 per cent per annum over the next decade, to reach around US\$ 120-159 billion by 2016. In volume terms, the market is expected to reach 31.96 million units by 2015 (ibid).

Human Resource Development

To prepare human resources for this sector, various vocational courses are being offered at different levels. These courses are of various duration starting from 6 months to 4 years. These courses are being offered in vocational school/ITI/Polytechnic and Engineering Colleges. A list of the courses along with their duration, entry requirements and the providers is given in table 3.

Table 3: Vocational Courses offered in Automobile Sector

(i) Short Duration

S. No	Name of Course	Duration	Entry requirement	Institution
1.	Driver-cum-mechanic (Light Motor Vehicle)	6 months	Passed 10 th Class	ITI
2.	Mechanic-Auto Electrical and Electronics	6 months	Passed 10 th Class	ITI
3.	Mechanic-Auto Electronics	2 years	Passed 10 th Class	ITI
4.	Mechanic-Automobile (Advance Diesel Engine)	2 years	Passed 10 th Class	ITI
5.	Mechanic Automobile (Advance Petrol Engine)	2 years	Passed 10 th Class	ITI
6.	Mechanic Repair and Maintenance of Heavy Vehicle	1 year	Passed 10 th Class	ITI
7.	Mechanic Repair and Maintenance of Light Vehicle	1 year	Passed 10 th Class	ITI
8.	Mechanic Repair and Maintenance of Two Wheelers	6months	Passed 10 th Class	ITI
9.	Mechanic (Diesel)	1 year	Passed 10 th Class	ITI

10.	Mechanic (Motor vehicle)	2 years	Passed 10 th Class	ITI
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(ii) Two year programme

11.	Automobile Engineering & Technology	2 years	Passed 10 th Class	School (+2 level)
12.	Mechanical Servicing	2 years	Passed 10 th Class	School (+2 level)

(iii) Distance Learning mode

13.	Certificate in Motor Cycle Service Repair (CMSR)			IGNOU (Distance Mode)
14.	Certificate in Two Wheelers Mechanism	1 year	Passed 5 th Class	NIOS (Distance Mode)

(iv) Diploma/Degree programmes

15.	Diploma in Automobile technology	3 year	Passed 10th Class Exam	Diploma
16.	Degree in Automobile Technology	4 year	Passed 12th Class Exam	Degree

Sector 3: Textiles, Apparel and Garment

The Textile Industry (including the garment industry) comprises of a wide range of products right from fibre formation up to the production of readymade garments. Textile products are also used in aerospace, military, marine, medical, transportation, etc. According to the 2009 survey conducted by the Ministry of Textiles, the textile industry which is currently valued at Rs 37, 118 crore will grow to Rs 70, 151 crore by 2012, of which Rs 65,000 will be consumed locally. During 2007-08, the textile exports recorded an increase of 15.6 per cent in US \$ terms and 2.8% in rupee terms (GOI, UBES, 2008-09).

The garment manufacturing and export industry forms the backbone of the economy of developing nations, viz., India, China, Pakistan, Bangladesh, etc. It is one of India's largest foreign exchange earners, accounting for nearly 16% of the country's total exports. It has been estimated that India had approximately 30,000 readymade garment-manufacturing units and around three million people are working in garment industry. The industry also helps to support labour working in ancillary units. The garment industry is anticipating a robust growth in the coming years, indicating huge opportunities for retailers.

The garment industry comprises the organised and unorganised sector. The organized sector generally consists of units having a minimum of 10 sewing machines under one roof. It is estimated that Garment Industry generates 3 jobs in-house and 2-3 jobs out-house for every sewing machine deployed.

The industry includes the garment industry comprising of

can be consumed locally. During 2007-08, the textile exports recorded an

Human Resource Development

The unorganised sector largely consists of job workers who carry out jobs given by supervisors. Two vocational courses (i) Textile Designing and (ii) Commercial Garment Designing and Making are offered at the higher secondary level. The courses are of 2 year duration and the entry qualification is 10th Class pass. The list of courses offered in this sector through the scheme of MES scheme of DGET in the area of Garment Making (as on 01.01.2008) is given in table 4. The list of AICTE approved courses for preparing skilled manpower for the textile Industry is given in table 5.

Table 4: Courses offered in Textile Sector

S. No.	Name of Course	Educational Qualification	Duration (Hrs.)
1.	Hand Embroider	5 th Class Pass	210
2.	Machine Embroidery Operator	5 th Class Pass	210
3.	Garment packer	5 th Class Pass	120
4.	Garment Ironer	5 th Class Pass	120
5.	Tailor (Basic Sewing Operator)	5 th Class Pass	270
6.	Maintenance of Machines in Garment Sectors	8 th Class Pass	300
7.	Computerized Embroidery Machine Operator	10 th Class Pass	210
8.	Garment Cutter	8 th Class Pass	270
9.	Garment Checkers	8 th Class Pass	210
10.	Skilled Sewing Operators	8 th Class Pass	210
11.	Special Sewing Machine Operator	10 th Class Pass	270
12.	Tailor- Children	8 th Class Pass	210
13.	Tailor- Ladies	8 th Class Pass	420
14.	Tailor-Gent's	8 th Class Pass	210
15.	Tailor-Suits	10 th Class Pass	300

Table 5: Post S.S.C. Diploma Courses offered in Textiles and Garments (Textile Engineering Group)

S. No.	Name of the Course	Duration (in Year)
1.	Fashion and Clothing Technology	3
2.	Dress Designing and Garment Manufacturing	3
3.	Garment Technology	3
4.	Knitting Technology	3
5.	Man-made Fibre Manufacture	3
6.	Man-made Textile Technology	3
7.	Man-made Textile Chemistry	3
8.	Textile Manufactures	3
9.	Textile Technology	3

There are a number of Colleges/Institutes in Fashion Technology or Fashion Design. National Institute of Fashion Technology (NIFT), which is an autonomous body set up in 1986 under the aegis of the Ministry of Textiles, Government of India is offering undergraduate and postgraduate programme through its centres in New Delhi, Bangalore, Chennai, Gandhinagar, Hyderabad, Kolkata, and Mumbai and Bhopal. The various undergraduate and post-graduate programmes as follows:

I. Undergraduate Programmes

The duration of all undergraduate programmes is 4 years. Eligibility for admission to undergraduate courses is 10+2 from a recognized Board of Education. The following programmes are being offered:

- 1. Fashion and Apparel Design:** The programme offers specialization in (1) Fashion Design, and (2) Leather Design. Fashion Design is offered at all NIFT centres while Leather Design is offered at New Delhi and Kolkata.
- 2. Fashion and Lifestyle Accessories Design:** The programme offers specialization in (1) Accessory Design (NIFT New Delhi), (2) Personal Products and Interior Accessories (NIFT Bangalore), (3) Footwear and Leather Products (NIFT Chennai), (4) Jewellery and Precious Products (NIFT, Gandhinagar), and (5) Interior Products, Handicrafts, Mix Media and Glass (NIFT Hyderabad).
- 3. Fashion and Textiles Design:** The programme offers specialization in (1) Knitwear Design (NIFT - New Delhi, Chennai, Kolkata and Mumbai), and (2) Textile Design (NIFT - New Delhi, Bangalore, Chennai, Gandhinagar, Hyderabad and Kolkata).
- 4. Fashion Communication:** The programme trains professionals to provide communication solutions for fashion in the most creative and financially viable manner. The programme is available at New Delhi and Mumbai centres.
- 5. Fashion Technology:** The programme trains students in core garment manufacturing technology. It offers specialization in (1) Apparel Manufacturing, and (2) Information Technology. Eligibility for the programme is 10 + 2 (with Physics, Chemistry and Maths) from a recognized Board of Education. It is offered through all the NIFT centres.

II. Postgraduate Programmes

The duration of all postgraduate programmes is 2 years. The following programmes are being offered:

- 1. Fashion Management:** Eligibility for the programme is graduation from a recognized University or Diploma in Accessory/Fashion Design/FIT from NIFT only. It is available at New Delhi, Bangalore, Gandhinagar, Hyderabad and Kolkata centers.

Courses offered in Textiles and Garments

2. **Fashion Technology:** Eligibility for the programme is B.E. / B. Tech. (Textiles /Apparel /Mechanical /Industrial Engineering /Production Engineering / Information Technology). It is available at NIFT, New Delhi.
3. **Master of Fashion Technology (Design Space):** The programme is available at NIFT, New Delhi and eligibility for admission to the programme is three years Bachelor's Degree or equivalent in any discipline recognized by the Association of Indian Universities or Diploma in any Design discipline/FIT from NIFT only.

Apparel Training and Design Centre (ATDCs), registered as a Society under Societies Registration Act were established to upgrade the technical skills of human resource employed in garment industry. The society is sponsored by Apparel Export Promotion Council (AEPC) of Ministry of Textiles, Government of India. Keeping in view the growing demands of the apparel industry, 39 ATDCs have been set up at Delhi, Noida, Gurgaon, Faridabad, Jaipur, Ludhiana, Kanpur, Bangalore, Hyderabad, Chennai, Trivandrum, Tirupur, Mumbai, Kolkata, Silvassa, Indore, Surat, Ghaziabad, Bhubaneswar, Ranchi, etc. The courses offered in ATDCs are given in table 6.

Table 6: Courses offered in Textiles and Garments in ATDCs

S.No.	Name of the Course	Eligibility	Duration
1.	Diploma in Apparel Manufacturing Technology (AMT)	12 th Class pass	1 year
2.	Production Supervision and Quality Control (PSQC)	12 th Class pass	6 months
3.	Apparel Merchandising Course (AMC)	Graduation/ Diploma in AMT	3 months

Sector 4: Tourism and Travel Industry

Tourism and Travel industry is booming worldwide and the demand for professionals is increasing in the industry and related sectors. Both domestic and international tourism in India is also increasing year by year.

Human Resource Development

The qualifications for various jobs in Tourism and Travel industry range from certificate to post graduate for different specializations in this sector. The details of the courses offered in Travel and Tourism are given in table 7.

Food Technology, Entrepreneurship and Management (NIFTEM), Kundhi, Doneport, Haryana, Indian Grape Processing Board, National Meat and Poultry Processing Board and strengthening of India Institute of Crop Processing Technology (IICPT) and State Nodal Agencies are some of the steps taken by the MoFPI to promote food processing sector. The Government has approved 10 Mega Food Parks (MFP) that would be set up in Andhra Pradesh, Assam, Jharkhand, Karnataka, Maharashtra, Punjab, Tamil Nadu, Uttar Pradesh, Uttarkhand and West Bengal States. These Mega Food Parks will be owned, operated and maintained by a Special Purpose Vehicle (SPV) which would be a body corporate consisting of individuals, firms, companies, banks and financial institutions, farmers groups, NGOs or government undertakings.

Sector 6: Printing Industry

The printing industry has grown in India over the years. The allied sector, which includes suppliers of ink, toner, print cartridges and other consumables extensively used in different printing processes also contribute significantly to the development of printing industry. Today, India is fast becoming one of the major print producer & manufacture of printed paper products for the world market. The industry has made significant progress in recent times in improving its machinery, technology and quality of printing. Computers and electronics have helped the industry in improving quality and speed of the jobs executed. There are large number of publishing firms in the private sector, but most of these are scattered throughout the country. Majority of them are very small in operation and each one of these may not be producing more than a dozen titles in a year. Printers are now adopting newer and modern technologies. Qualified printing professionals are required in printer manufacturing houses and consumable producing companies. There are more than 1,30,000 printing presses of all types in India and more than 10 million families are involved in the Industry. The quality standards have improved dramatically and immense production capacities have been created.

Human Resource Development

Printing Technology courses offered through Polytechnics, ITIs, ITCs, Colleges and Universities have gained immense popularity among learners. The courses offered in the area are given in table 9. The scope for printing as a subject is huge and involves studying of different analog and digital technologies. Besides, introducing courses for preparing human resource for initial training, there is a need to upgrade the skills of the technicians working in the industry. New courses should be introduced for all segments of the industry which include pre-press, post-press, finishing and packaging.

The Indian Printing Packaging and Allied Machinery Manufacturer's Association (IPAMA) is the apex body of graphic arts machinery (printing/packaging/converting) manufacturers of India. According to IPAMA, in the next 10 years time, the Graphic Arts Industry will need around 300,000 skilled persons in all segments of printing and packaging units, which include machine manufacturing, printing, packaging unit, or converter (makers of corrugated boxes, cups, paper plates, paper rolls, tissue papers, etc.).

Table 9: Courses offered in Printing Technology

S. No.	Name of the course	Eligibility	Duration
1.	Bachelor of Printing Engineering	Plus Two	2 years
2.	B.E./ B.Tech. in Printing Technology	Plus Two with Physics, Chemistry and Maths (PCM)	4 years
3.	M.S. in Printing and Media Technology	B.E./B.Tech. or AMIE in any branch of Engineering.	2 years
4.	B.E. in Printing Engineering and Graphic Communication	Plus Two with Physics, Chemistry and Maths (PCM)	4 years
5.	M.E. in Printing Engineering and Graphic Communication	B.E. Printing Technology (or) B.E. Mechanical /EEE/ECE/Chemical Engineering with 2 years of experience in Printing industry	2 years
6.	Diploma in Printing Technology	S.S.L.C. / Plus Two	3 years
7.	Certificate Course in Printing Technology	9th pass or S.S.C pass	1 year

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