

# Education scenario and needs in India: Building a perspective for 2025

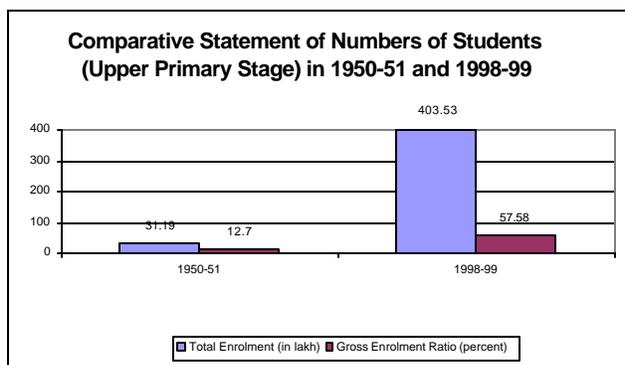
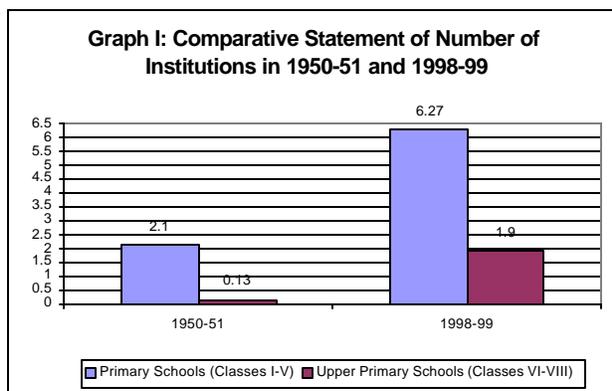
Suman Sachdeva

## SECTION-I

The Indian Constitution resolves to provide quality education to all and in an effort to fulfill the educational needs of the country specifically for the diverse societies and cultures of the country the government has chalked out different educational categories: Elementary education, Secondary education, Higher education, Adult education, Technical and Vocational education. Despite serious handicaps of means and resources, the country has built up during the last 50 years, a very large system of education and has created a vast body of men and women equipped with a high order of scientific and technological capabilities, robust humanist and philosophical thought and creativity. It would be worthwhile to observe the trends in the different sectors of education from post Independence period to the present scenario.

## Sectors of Education

### Elementary Education



At the time of Independence, only fourteen percent of the population was literate and only one child out of three had been enrolled in primary school. The need for universal education for all children in the age group of 6-14 years recognized as a crucial input for nation building, was given due consideration in successive Five Year Plans and has resulted in a manifold increase of spatial spread, infrastructure facilities, increased coverage of various social groups; but the goal of providing basic education to all continues to be elusive.

The elementary education system of India has expanded into one of the largest in the world. The number of primary schools increased from 2.15 lakhs in 1950-51 to 6.1 lakhs in 1997-98; the corresponding increase in upper primary

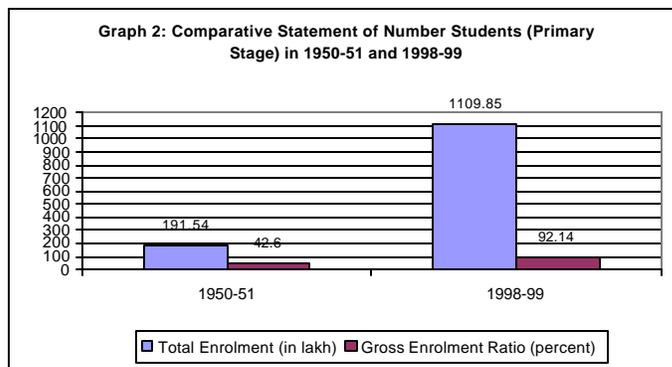
schools was from 0.14 lakhs to 1.85 lakhs<sup>1</sup>. These 8.17 lakh schools together enrolled 1110 lakh children as compared to 192 lakh in 1951<sup>2</sup>. Universal provision of education has been substantially achieved at the primary stage (classes I-V). An estimated 95 percent of the rural population living in 8.26,000 habitations has a primary school within a walking distance of 1 Km and about 85 percent of the rural population has an upper primary school within a walking distance of 3 Kms<sup>3</sup>. More than 150 million children are currently enrolled covering around 90 percent of the children in the age group of 6-14 years. Recent surveys on literacy rates indicate a phenomenal progress in the nineties and indicate a significant rise in the literacy level. (Refer Table 1.1) According to the National Sample Survey estimates, the literacy rate has increased about 12 percentage points in a period of six years from 52.21 in 1991 to 64.20 percent by 1997.

**Table 1.1**

| Year | Literacy Rate (%) |       |         | Number of Schools |               |
|------|-------------------|-------|---------|-------------------|---------------|
|      | Persons           | Males | Females | Primary           | Upper Primary |
| 1951 | 18.33             | 27.16 | 8.86    | 215036            | 14576         |
| 1961 | 28.31             | 40.40 | 15.34   | 351530            | 55915         |
| 1971 | 34.45             | 45.95 | 21.97   | 417473            | 93665         |
| 1981 | 43.56             | 56.37 | 29.75   | 503763            | 122377        |
| 1991 | 52.21             | 64.13 | 39.29   | 566744            | 155926        |

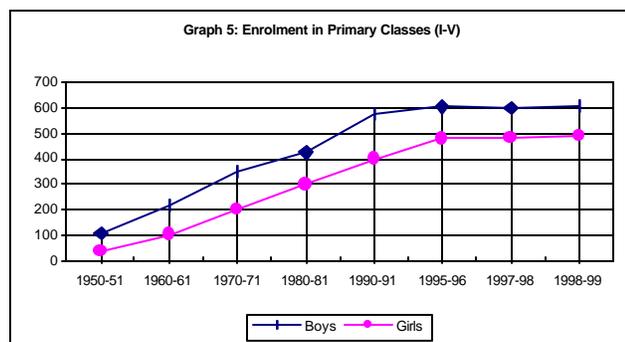
*Note: Literacy rates of 1951, 1961 and 1971 relate to population aged five years and above. The rates for the years 1981 and 1991 relate to the population aged seven years and above.*

Source: EFA India: Year 2000 Assessment



Since independence, there has been a substantial increase in enrolment at all levels of education, five fold from 19.2 million to 110.9 million in 1998-99 at the primary stage; 3.1 million to 40.4 million in the upper primary stage. The gross enrolment ratios of children in the

age group 6-11 increased from 42.6 percent in 1950-51 to 92.14 percent in 1998-99. Likewise, the gross enrolment of 11-14 years age group increased from 12.7 percent in 1950-51 to 57.58 percent in 1998-99.



<sup>1</sup> Source: Education in India 1992, and Selected Educational Statistics, 1997-98. Department of Education

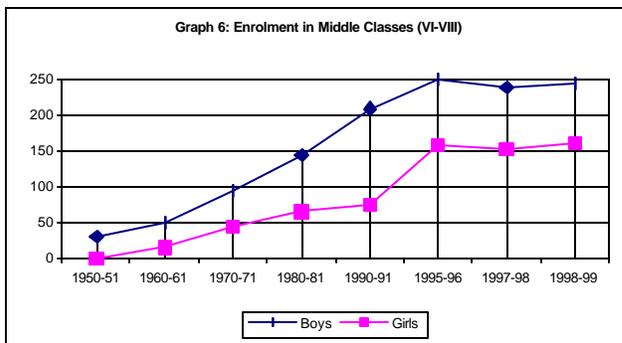
<sup>2</sup> Source: Annual report 1999-2000 Ministry of Human Resource Development

<sup>3</sup> EFA India: Year 2000 assessment

Girls enrolment has grown at the primary stage from 0.4 million in 1950-51 to 4.8 million in 1998-99 and at the upper primary stage from 0.5 million to 16.3 million. The rate of growth of enrolment of girls has been higher than that of boys but disparities still persist-girls still account for only 43.4 percent of the enrolment at the primary stage and 40.5 percent at the upper primary stage.

The enrolment of Scheduled Castes and Scheduled tribes has increased considerably at the primary stage. The participation of SCs and STs is now more or less in proportion to their share in population at the primary level.

Despite such significant achievements in the recent years, it is realized that there are serious problems of gender, regional, sectional and caste disparities in UEE. A significant proportion of children continue to drop out due to socioeconomic and cultural factors as also due to lack of adequate infrastructure, shortage of teachers and unsatisfactory quality of education provided.



The country has the dubious distinction of having the largest number of illiterates and out of school children in the world-30% of the world's adult illiterates (300 million) and 21.87 percent of out-of-school children. At least 24 million children in the age group 6-14 are out of school of whom about 60% are girls; about 121.3 million are adult illiterates in the age

group 15.35 of whom about 62 percent are women. Given the demographic pressures the numbers are likely to increase further. Universalisation of elementary education thus, poses a formidable challenge to India: the numbers of children dropping out, not attending school regularly and never enrolled are immense. Quality of education is poor, teachers are inadequately trained and have lack of motivation. The Constitution of India refers to free and compulsory education for all children up to the age of 14. The priority concerns for the country remain particularly with improving the quality of education and making education effective, enjoyable and relevant to the children. Also, a major concern is to improve the skills and motivation of teachers, promoting the participation of communities in the running of schools and enrolling/retaining girls/working children of urban poor and children with special needs in schools.

Also, in India, a large universe of working children exists such as the street children, neglected and destitute children, children of sex workers and children practicing as sex workers. Many of these have been targeted through non-formal initiatives but never mainstreamed. Also, along with access and retention, the quality of education provided to them is questionable.

## Adult Literacy

Since independence, eradication of illiteracy has been one of the major national concerns of the Government of India. The Kothari Commission (1964-66) emphasized the importance of spreading literacy as fast as possible and suggested measures for the same.

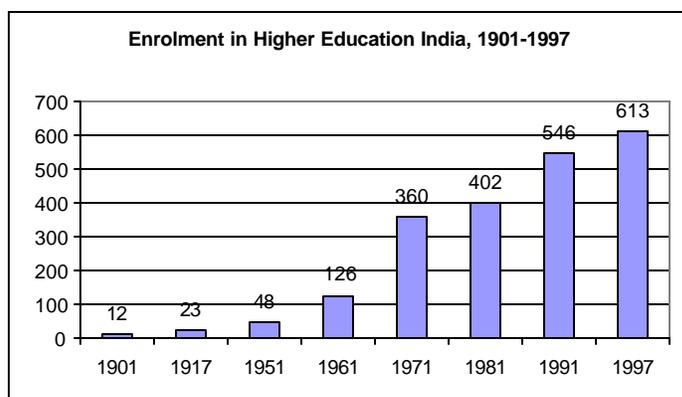
The Resolution on NPE 1968 not only endorsed the recommendations of the Education Commission but also reiterated the significance of universal literacy and developing adult and continuing education as matters of priority. Later, the National Policy on Education (1986) gave an unqualified priority to programmes for eradication of illiteracy, particularly among women, members belonging to Scheduled Castes and Scheduled Tribes particularly in the rural areas.

As per the NSSO survey, the literacy rates have jumped from 52 percent in 1991 to 62 percent in 1997 against the countering factor of population growth. This has to be seen against the backdrop of an average decadal growth of only 8.5 percent between 1951 and 1991. The wide gap between male and female literacy rates seems to be narrowing as also the urban and rural difference. Recent surveys indicate an improvement in the pace of literacy, mobilization of communities for education, provision of a life long opportunity to non-literates and creation of a learning society.

## Secondary Education

Secondary education serves as a bridge between elementary and higher education and prepares young persons in the age group of 14-18 for entry into higher education. Children's population at the secondary and senior level, as projected in 1996-97 by NSSO has been estimated at 9.66 crores. Against this, the enrolment figures of 1997-98 show that only 2.70 crore are attending schools. Thus, two-thirds of the eligible population remains out of school system.

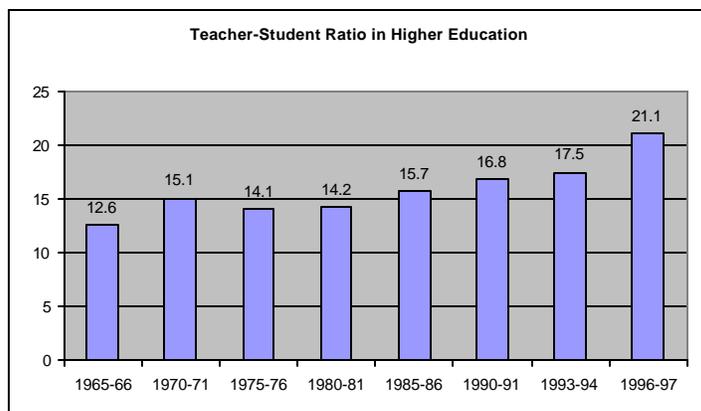
## Higher Education



Source: Higher Education in India: Vision and Action: Country Paper, Indian National Commission for Cooperation with UNESCO, Department of Education, MHRD, GOI, New Delhi.

At independence in 1947, India inherited a system of higher education which was not only small but also characterized by the persistence of large intra/inter-regional imbalances. Determined efforts were made to build a network of universities, and their affiliated colleges which provided tremendous outreach to a country of vast diversities in language as also in prevailing standards of

education at the lower levels.



Source: Higher Education in India: Vision and Action: Country Paper, Indian National Commission for Cooperation with UNESCO, Department of Education, MHRD, GOI, New Delhi.

In the post independence period, higher education expanded fast and today India ranks very high in terms of the size of the network of higher education institutions, with 6.75 million students enrolled and teaching force numbers about 321,000. Students enrolment increased from 263,000 to 6,755,000 by 1996-97, growing at an estimated rate of 7 per cent between 1987 and 1993 but now declined to 5.5

percent compound rate of growth, with 14 states having a lower rate. In spite of this phenomenal growth, the total enrolment, however, forms only about six percent of the relevant age- group (17- 23) population. The number of students per 100,000 population has increased significantly since independence. It was only 48 per 100,000 in 1951 increasing to 613 per 100,000 in 1997.

The number of women's colleges has recorded a substantial increase from 780 colleges in 1986-87 reaching a figure of 1195 in 1996-97. Of the total enrolment, women's enrolment accounts for 34 percent. Out of the total number teachers in higher education, Professors and Readers account for 12.8 and 26.2 % respectively, in the University Department and University Colleges. In the affiliated colleges there are 13.9 % senior teachers and 81.7 % lecturers. There were 21 students for one teacher in 1996- 97 as compared to 12 students per teacher in 1965- 66.

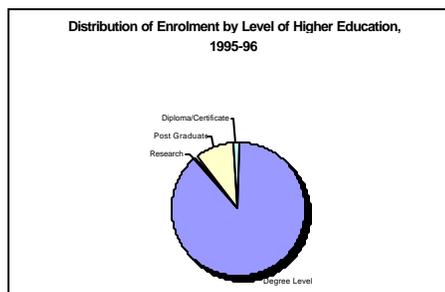
The number of students has reached the level of 6.75 million and there are 3,21,000 teachers in the higher education system. A special emphasis has come to be laid on women's education. The enrolment of women at the beginning of 1997-98 was 2.303 million, 34 percent of them being of the postgraduate level.

#### Growth in Higher Education in India

| Institutions      | 1950-51 | 1990-91 | 1996-97 |
|-------------------|---------|---------|---------|
| Universities*     | 30      | 177     | 214     |
| Colleges          | 750     | 7346    | 9703    |
| Enrolment ('000s) | 263     | 4925    | 6755    |
| Teachers ('000s)  | 24.0    | 272.7   | 321.0   |

**Note:** \*includes institutions deemed to be universities, but excludes other institutions

At the beginning of the year 1999-2000, the total number of students enrolled in the universities and colleges was 74.18 lakh-12.25 lakh in university departments and 61.93 lakh in the affiliated colleges. Eighty percent of total enrolment was concentrated in the three faculties of Art (40%), Science (20%) and commerce (20%) while the remaining 20% was absorbed by the professional faculties. Enrolment at the degree level was 65.20 lakh (87.9 percent), at the PG level 7.25 lakh (9.8 percent) and the remaining at research and diploma/certificate levels. The enrolment of women students in the year 1999-2000 was 27.74 lakh at the graduate and postgraduate levels, accounting for 34 percent of the total enrolment. The strength of the faculty went upto 3.42 lakh in 2000.



### **Vocational Education**

Prior to the introduction of vocational courses in general schools and colleges at all levels, there have been conventional models of vocational education in operation, in institution under Technical education, Pharmacy Council, Nursing Council, Dental council, Agricultural Council, and the Directorate General of Employment and Training in the labour ministry, etc. Vocational education was also in operation in non-formal, adult and voluntary sectors in addition to the formal sector.

Recently, VE was introduced in Secondary schools meant for general education, which are concerned primarily with basic academic subjects, in no way connected with vocational courses or apprenticeship. Vocational courses started in general education at +2 and +3 stages of 10+2+3 aimed at imparting both knowledge and skill pertaining to vocation and attained equal importance.

Currently vocational education and training is being offered by a variety of Government and Non-government Institutions nation-wide: a) Schools with vocational stream at the +2 level b) Industrial Training Institutes (ITIs) c) Community Polytechnics d) National Open School e) Open Universities, Selected College / Universities f) Krishi Vigyan Kendras g) Non Government Organisations e) Special Institutions.

Although substantial expansion in facilities has taken place in the last 10 years with new schemes, new courses and new institutions, these have been unable to meet the challenge and demand of industry, employment and the public.

### **Technical Education**

During the past five decades, there has been a phenomenological expansion of technical education facilities in the country and it has played a significant role in the process of economic and technological development of India by producing high quality manpower needed for various sectors and by providing essential services through research and innovations. Strong linkages between technical institutions and industry were developed.

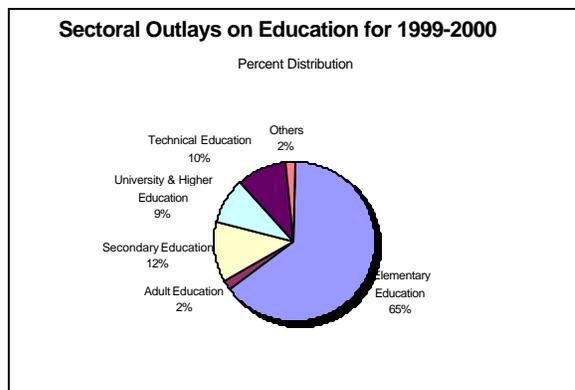
Several new initiatives have been effected such as the Technology Development Missions, modernization and removal of Obsolescence, research and development etc. The thrust areas of technical education is to provide project based financial support for creation of infrastructure in terms of modern laboratories in the thrust areas, a strong base for advanced level work by identifying programmes and courses by institutions, taking into account the country's and regional needs with special attention to rural society and disadvantaged sections and develop horizontal and vertical linkages with other institutions, research laboratories, industry and user agencies through multiplicity of programmes including consultancy.

Different state governments have taken a variety of initiatives to promote IT education. In addition, several innovations are taking place outside the Government system. In most cases replication of such innovations is neither time consuming nor expensive.

## Allocation and Expenditure on Education

The concept of 'investment in education' was explicitly adopted by the Government of India in the National Policy on Education, 1968. Keeping in view the growing requirements of the education system, the Government of India promised to allocate at least six percent of national income to education from the public exchequer, a goal set for realization by the end of the Ninth Five Year Plan i.e., by 2002.

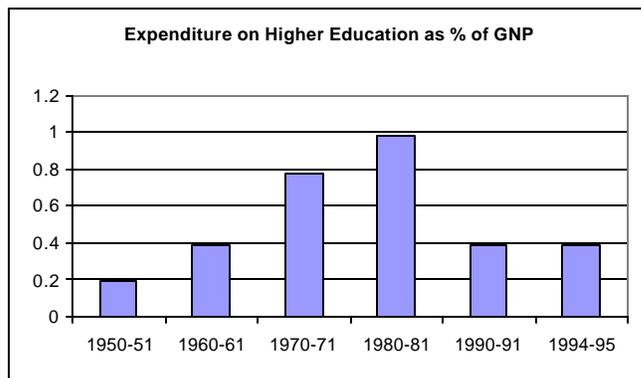
The educational explosion that has taken place in India during the post-independence period in terms of number of students, schools and colleges, and teachers, is also reflected in the growth of expenditure on education (at least in current prices). In



absolute terms, the educational expenditure increased from Rs 1.1 billion in 1950-51 to Rs. 412 billion in 1997-98. The increase is by a staggering 360 times. But this impressive growth is belittled by (a) rapid growth in population, (b) phenomenal increase in student numbers, and above all, (c) escalation in prices. While the total expenditure increased by 360 times, in per capita terms the increase during 1950-51 to 1997-98 has been by about

130 times. In contrast, the expenditure per pupil increased only by 62 times during the same period, from Rs. 35.60 to Rs. 2224.

Presently 3.6 percent of GNP is invested in education in India (1997-98). Compared to the very low level of 1.2 percent in 1950-51, this marks a very significant progress. Plan expenditure on education, including in case of elementary education, is relatively very small compared to non-plan expenditures form the major chunk of expenditure on education. However, the budget for Elementary Education has been enhanced from Rs. 2852 crores (1 Crore = 10 Million) in 1999-2000 to Rs. 3608 crores in 2000-01.



Huge investments have been made in *higher education* in independent India with total expenditure on higher education increasing remarkably. On the whole, the trends suggest that the higher education had a good start during the 1950s (with real growth of 7.5 % per annum), and had its golden days during the 1960s, with the real expenditure increasing at an annual

rate of growth of 11 percent; but it suffered significantly during the 1970s, with the rate of growth coming down to a meagre 3.4 % as educational planners aimed at consolidation of higher education instead. The 1990s heralded an era of austerity and higher education suffered greatly. Although, in 1996-97, the government expenditure of Rs. 42,035 million rose further during the subsequent period, this impressive growth was, however, considerably offset by increase in prices, and increase in population, more particularly student numbers in higher education. Inflation has had an adverse effect on education.

For the *Vocationalisation of Secondary Education*, an amount of Rs 100 crore was provided under the Ninth Five Year Plan. By 1999, about 11 crores was spent on the implementation of the programme. For the year 2000, an amount of Rs 10.50 crore was budgeted. The expenditure went down in the first two years of the plan.

An amount of Rs. 100 crores was provided for the programme of vocationalisation during the 9<sup>th</sup> Five Year Plan. The Budget for the current financial year has been enhanced from Rs. 10.5 crores in 1999-2000 to Rs. 35 crores in 2000-2001.

For *Information Technology*, the existing plan allocations of the Ministry for Technical Education sector have been to tune of around Rs 500 crore, total Ninth Plan outlay is Rs 2375 crore. This provision is made against earmarked all ongoing and already approved schemes.

## SECTION-II

## **Policies and Programmes**

### **National Policy On Education**

Educational policy and progress have been reviewed in the light of the goal of national development and priorities set from time to time. The National Policy on Education (NPE-1986) provides for a comprehensive policy framework for the development of education upto the end of the century and a Plan of Action (POA) 1992, assigning specific responsibilities for organising, implementing and financing its proposals.

#### *Policy Framework*

India's commitment to the spread of knowledge and freedom of thought among its citizens is reflected in its Constitution. The Directive Principle contained in Article 45 enjoins " the State shall endeavour to provide within a period of ten years from the commencement of this Constitution, for free and compulsory education for all children until they complete the age of fourteen years". Article 29 (i) provides that any citizen having a distinct language, script, special care of the economic and educational interests of the underprivileged sections, particularly, the Scheduled Castes and Scheduled Tribes is laid down as an obligation of the State under article 46.

In the NPE, almost all the elements that figure in the declaration and framework of the World Conference on Education for All, held in Jomtien in March 1990, are present. The policy envisages that the basic learning needs of every person, child, youth and adult should be met through a variety of delivery systems, there is no trade-off between quantity and quality, achievement of minimum levels of learning are as important as participation, the traditional forms of primary education do not actually deliver, supply of services should be matched by generation of demand, and only by returning education to the community and by partnership between the government, civil society and stakeholders can basic education needs be met satisfactorily. The policy paved the way for enhanced support to the state governments for school improvement, in service teacher training and non-formal education.

NPE was reviewed during 1990-92 by the Acharya Rammurthy Committee (1990) and N Janardan Reddy Committee (1992) and necessary amendments were made, on the basis of which, the Programme of Action (1992) was chalked out and based on its recommendations provisions were made in the eighth plan.

1. Around the time the National Education policy (1986) was formulated amendments to the constitution were mooted to vest the local bodies with a constitutional status and entrust them with the delivery of social services such as *primary education*. The process was completed in 1994.

The Policy (1986) took a serious note of the conditions related to basic facilities and other support systems in the country. It emphasised on elimination of disparities in the education system and on improvement in the quality of publicly funded schools so that

irrespective of the socio-economic background every child has access to basic education of a comparable quality. It also called for paying immediate attention to:

- Improving the unattractive school environment, the unsatisfactory condition of buildings and the inadequacy of instructional materials; and
- Laying down minimum levels of learning that all children completing different stages of education should achieve.

In accordance with the Constitutional commitment to ensure free and compulsory education for all children upto the age of 14 years, provision of universal elementary education has been a salient feature of the NPE and the Programme of Action 1992. Later, the Unnikrishnan Judgement 1993 also spelt out that, "Every child/citizen of this country has a right to free education until he/she completes the age of fourteen years". The Education Ministers' resolve in 1998 also supports the cause of UEE by stating that Universal Elementary Education should be pursued in the mission mode and that there is a need to pursue a holistic and convergent approach towards UEE. The National Committee's Report on UEE in the mission mode (1999) also reiterated the above with an emphasis on preparation of district elementary education plans for UEE. It supported the fundamental right to education and desired action towards operationalisation of the mission mode towards UEE. The NPE also spelt out the need for the training of the teachers for effective implementation of UEE. It is with respect to the above objectives that several initiatives and strategies have been planned and implemented in the areas of *Primary and Elementary Education*.

2. *Adult education* is an important part of the NPE, not the central part though, given the flavour and priority accorded to quality, efficiency and excellence as lubricants in the new economic development approach.

Recognising human resource development and its constant up gradation apace with technology advances as a critical development issue, the NPE underlined the crucial importance of a systematic programme of adult education, aligned in its objectives, to the national goals, of poverty alleviation, national integration, environmental conservation, etc. Towards this end, all existing adult education programmes were to be reviewed and strengthened. Especially about adult literacy, the NPE's resolve was clear:

- The whole nation must pledge itself to eradication of illiteracy, particularly in the 15-35 age group. The Central and State Governments, political parties and their mass organisations, the mass media and educational institutions must commit themselves to mass literacy programmes of diverse nature... The mass literacy programme will include, in addition to literacy, functional knowledge and skills, also awareness among learners about the socio-economic reality and the possibility to change it (MHRD, 1986a: 9).

The NPE's Programme of Action (MHRD, 1986b: 130) spelt out the operational strategy of covering the 100 million non-literates – 40 million by 1990 and another 60 million by 1995. However, given the track record of woefully inadequate coverage of the stipulated targets in the past, and also given the magnitude, the POA proposed the eradication of illiteracy, to be treated with a sense of urgency and, therefore, to be made a “mission” – a technical and societal mission.

The three dimensions of NPE and its POA strategy towards adult education deserve notice. One is the sense of urgency and the imperative of involving of the whole society. Second is the expansion of scope of coverage, to increase the range of agencies and their operational efficiency and accountability, through review and evaluation. The third is the role delineation – policy and direction with the Centre, functional autonomy in implementation to States and involvement of the community at the grassroots level (MHRD, 1986b: 135).

3. The NPE as revised in 1992 lays emphasis on widening the access to *Secondary Education and Higher Education* with emphasis on enrolment of girls, SCs and STs, particularly in Science, Commerce and Vocational streams.

Higher education, according to the 1986 Policy and its review around 1996, provides people with an opportunity to reflect on the critical social, economic, cultural, moral and spiritual issues facing humanity and contributes to national development through dissemination of specialized knowledge and skills. The policy urged that in the context of the unprecedented explosion of knowledge, higher education had to become dynamic as never before, constantly entering uncharted areas, and it proposed that a large number of universities and colleges in the country needed all round improvement and that the main emphasis in the immediate future should be on their consolidation and expansion.

4. The NPE accords high priority to the *Vocational Education* and stipulates the following as the main objectives: to provide diversification of educational opportunities so as to enhance individual employability, reduce mismatch between demand and supply of skilled manpower and provide alternative avenues for those pursuing higher education. Vocationalisation of education was also identified as a priority area in the Eighth Five Year Plan. The revised policy formulations which set forth the modifications to the NPE, however, retained the policy framework laid down by NPE. The target coverage was however, revised to divert 10 percent of the higher secondary students by 1995 and 25 percent by the year 2000.
5. *Provision in IT Legislation*

Lok Sabha has passed the information Technology Act 2000 which aims “to provide legal recognition for transaction carried out by means of electronic data interchange and other means of electronic data interchange and other means of electronics

communication, commonly referred to as 'electronic commerce', which involve use of alternative to paper-based methods of communication and storage of information, to facilitate electronic filing of documents with the government agencies..." the Bill marks a watershed in the conduct of affairs in the government, signaling a new beginning in the official transactional mode.

Several State Governments such as Andhra Pradesh, Karnataka, Gujarat, Maharashtra and Tamil Nadu have established Information Technology Policy for promoting the IT industry and IT enabled services. These states have clearly recognized the strategic importance of information technology in creating a compete economy equipped to face the challenge and exploit the opportunities of the future.

### **SECTION-III**

The above sections have attempted to understand the educational scenario in our country from post-independence period to the present, elaborating upon the modalities by which the various levels of the education sector (elementary to technical) operate, simultaneously reflecting on the policy provisions made for each of these and the way these are translated into action by the government and private systems.

The sections have also highlighted the envisaged progress in terms of targets set according to government policy and pronouncements along with the gaps that exist in the attainment of these targets. Considering the requirements at present and the gaps existing, it may be useful to understand the educational scenario that will exist in the year 2025. Consequently, it may be worthwhile to reflect on the requirements for the education sector in the year 2025 and analyse the capacity of the system to fulfill them.

#### **A critique...**

With respect to the Educational scenario, for the year 2025 we have significant requirements and goals set for ourselves, which will enable our nation to possess self-equipped citizens holding a key to the progress and development in all spheres. This implies that all the provisions stated in the NPE must be realized by 2025.

To begin with, it is important to understand the quantitative requirements of the sector concerning issues of enrolment, school infrastructure, and teacher availability etc. Thereafter, it will be logical to analyse the scenario that will exist in the year 2025, with respect to the attainment of the requirements.

The total population of India in the age group of 6-13 years was 170 million in 1991 and the corresponding enrolment at the **elementary level** was 136.50 million<sup>4</sup>. In 2025 the population figures for the same age group have been projected as 199 million<sup>5</sup>. Adding 15 per cent for overage and underage children, this number will increase by 30 million. As per the objective of UEE, assuming that all the children in the age group of 6-14 years will be in school, in the year 2016, the elementary school system (class I to VIII) will have to cater to a number of 229 million children.

The enrolment in 1998-99 was 151 million. The system thus, has to cater for three-fifth more number of school places. The number of teachers in 1998-99 was 3.2 million at the elementary stage. If we calculate the teacher requirement for the same year according to the teacher-pupil ratio of 1:35, it clearly signifies a shortfall of nearly 0.70 million teachers. The teacher requirement for year 2025 can also be worked out by dividing the child enrolment at the elementary level in 2025 by 35, as the revised norm for teacher-pupil ratio is 1:35. This number works out to be 7 million teachers at the elementary level for the year 2025. This would thus, mean a requirement of nearly doubling of the teacher force in 15 years. With respect to the classroom requirement at the rate of one classroom for every teacher, the requirement in 2025 will be approximately 7 million.

At the **Secondary stage**, the enrolment figures for the children in classes IXth and Xth in 1998-99 was 18.45 million. The enrolment figure for the same classes in the year 1991 was 15.2 million. If we calculate the growth rate<sup>6</sup> from 1991 to 1998-99, it comes to about 2.5 percent per annum. Considering the same growth rate for the next eighteen years, we can project enrolment figure in the year 2025 as 36 million. Adding 15 per cent for overage and underage children, this number will increase by 5.4 million. The secondary school system (class IX and X) will thus, have to cater to a number of 41.4 million children. Accordingly, the teacher requirement, as per the norm of 1:25, will be 1.7 million in the year 2025.

For the **Higher secondary stage** (XI to XII), the total enrolment was 5.46 million in 1991 and the corresponding enrolment at the higher secondary level was 6.92 million in 1998-99. Using the Growth rate in the years 1991 to 1998-99 as 3 percent per annum, the enrolment figures in the year 2025 can be projected as 15.38 million. Adding 15 per cent for overage and underage children, this number will increase by 2.31 million. Thus, in the

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<sup>4</sup> Selected Educational Statistics (as on 30<sup>th</sup> September 1998) 1998-99 Government of India MHRD Department of Secondary Education and Higher Education Planning, monitoring and statistics division, New Delhi 2000.

<sup>5</sup> Refer to chapter by Prof Maribhatt

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Growth rate= (Enrolment of 1998-99/ Enrolment of 1991)

year 2025, the Higher Secondary system (class XI to XII) will have to cater to a number of 17.69 million children.

The teacher requirement for year 2025 can thus be worked out by dividing the enrolment figure in 2025 by 25, as the norm for teacher-pupil ratio at the Higher Secondary level is 1:25. This number works out to be 0.71 million for the year 2025.

In the area of **Information Technology**, based on the current availability of intake capacity at various institutions and projected additions to the system considering linear extrapolation, it is estimated that 2.63 lakh postgraduates (including MCAs), 7.85 lakh graduates and 7.42 lakh diploma holders in IT and related areas would be added to the system by 2008<sup>7</sup>. The projections are based on the assumption that 50% of the students from electronics and communications and 30% from other engineering disciplines would work in the IT software sector. This would mean that 10.48 lakh IT graduates (PG, MCA and UG) will be available for the hard core IT sector and 7.4 lakh for the IT enabled services from the AICTE recognized institutions. Other institutions (IITs, IIITs and IISc Bangalore) would add nearly 12000 graduates by 2008. Therefore, a total of around 10.60 lakh graduates will be added to the system by 2008.

For the IT enabled services, non-formal sector itself has a capacity of 5 lakh as per MIT estimates (growing rate of 20%). BIT courses in recognized institutions, distance education programmes of open universities and correspondence course institutes add another 60000 per annum (growing at 15%). All this together would add up to several times the actual manpower requirement projected for the IT enabled services including teacher requirement for the school sector. It is estimated that total size of **IT industry** in India will be over US \$ 100 billion by 2008, largely from IT services.

One of the key issues in achieving and sustaining this level of growth will be the availability of high quality IT professionals in adequate numbers. As per NASSCOM study, this would require 22 lakh IT professionals-11 lakh in the hard-core IT sector and another 11 lakh for the IT enabled services.

Ministry of Information Technology has worked out a figure of 23.67 lakh in three categories-2 lakh IT professionals of category A for software products, 5.77 lakh of IT professionals of category B for IT services and E-business and 15.9 lakh of IT professionals of category C for IT enabled services and E-business. This would mean 7.77 lakh professionals in the hard core IT sector, if we broadly fit in category A and Category B manpower here. This requirement is less than projected by NASSCOM largely due to assumptions of very ambitious growth in productivity.

Further, it is estimated that nearly 20000 teachers in the formal tertiary education sector with PG or research qualifications would be required. Assuming a very realistic target of

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<sup>7</sup> Projections available till 2008 only

all secondary schools providing computer education by 2008, requirement of teachers for school sector would be in the range of 100000. This would be largely fed by BCA and equivalent degree holders. It is expected that there will be significant use of computers and Internet even at the primary and pre-primary level by 2008. There would be additional teacher requirement for the purpose.

In addition to the national demand there would be international demand in view of intrinsic quality of Indian software professionals and therefore premium attached to them. However, notionally, we could take it as 20% of the overall manpower requirements. The demand for IT professionals from USA under HIB Visa has increased to around 200000 from the present level of 114000. Similarly, other countries are likely to permit immigration at a level between 20000 to 30000 per annum for IT professionals. According to the NASSCOM report, India could earn up to 12% of the projected \$142 billion global market over the next eight years.

### **Optimal Requirement versus realistic scenario**

Given the requirements in purely quantitative terms it is important to understand the non-negotiables for their achievement in 2025. Firstly, it will be critical to have at least a growth rate of 9-10 per cent per year in the economic sphere, necessitating the requirement for human skills, especially the research skills. There will be no compromise with respect to enrolment and retention of children in schools. For this there must be 100 per cent literacy and 100 per cent enrolment at primary, secondary and technical levels. The problem of dropouts will need to be mainstreamed together with the quality of education at the primary, secondary and technical levels and for this the rural sector will be mobilized and encouraged in the cause of education.

Economic development of our country is built around educational development. There is considerable data which shows that education is based on economic development and vice versa. This aspect has also been realized by the community at large and education is now being considered important. This is even highlighted by the analysis of household income vs expenditure, which shows that investment in education in even the poorest households is high. People have understood the economic value of education and are now ready to invest. This is also seen in the fact that many youths are opting out of labour force and are spending larger period on education.

However, the government's capacity to pay for education is limited. Even now the GDP is only 4 percent and has not reached even 6 percent as envisaged in 1966 by the Kothari commission and thereafter in the VIIIth plan as 10 percent. Thus, there is a need to explore private and other investments. It has been established beyond doubt that besides its social and cultural dimensions, education is also an economic and political investment yielding long-term benefits. It is, therefore, not only justifiable but also desirable to focus on this investment in order to gain maximum benefit.

In terms of allocation for education, it needs to be underlined that the present 3.6 percent of GNP is less than

- (a) the requirement of the education system to provide reasonable levels of quality education to all the students enrolled presently,
- (b) the requirements of the system to provide universal elementary education of eight years for every child of the age-group 6-14, and consequent growth in secondary and higher education, as universalisation of elementary education in a comprehensive sense, includes universal provision of resources,

This implies that it will be important to raise money from private sources in order to ease pressure on public spending. This, of course, is not meant to release the state from its financial commitments, which have been substantial in India.

Demand for higher educated manpower will increase substantially in the near future and this will impel central focus on the quality and quantity of manpower produced by the higher education system. Both for quantitative expansion and improvement in quality, the system will require large additional resources. Increasing needs stemming from population growth, need for modernization and the limited nature of resources, will be problems facing financing of education.

Along with the issue of investment, the quality issue also demands attention at all levels of education. In this context, the Research and Development area, which is extremely weak, has to be focused. This area is critical as it provides base to the planning process, links it up to the implementation and subsequently highlights areas for reform. A weak system endangers the life of the intervention, its sustainability and impact. Realising the strategic shift in focus from merely access to quality inputs in all interventions at all levels of education in 2025, it will be required to concentrate on R&D rigorously. Ideally, this area in the laboratories and universities will focus on state-of-art technologies, adapting them to local conditions, developing new indigenous ones and enhancing production and productivity. The R&D set up in the universities would be greatly enhanced to inculcate the spirit of research in the minds of the students. There would be a greater stress on sponsored applied research in the universities, apart from the fundamental research. Industry-institutions linkages would be strengthened which would give boost to research activities and consequent improvement in productivity and production. R&D activities in the private sector would have a substantial presence, as industry and corporates realize the importance of knowledge capital in a knowledge-based economy.

In order to achieve the above, focus on R&D will be required in economic terms as well. Considering our country's extremely low expenditure (0.7 %) in R&D as compared to other countries, the private sector will have to significantly contribute to this area. Along with this, a useful strategy will be to strengthen the universities for research and development activities and not operate through just individuals. This will enhance education quality and thus, education could be integrated with development. This action

will contribute to better planning for 2025 and if not pursued in the mission mode, planning will bear the same consequences as now.

Linked to the overall issue of education is the sublying aspect of Value education. It is feared that the more we industrialize, greater will be the need for value education at all levels. Although, we have been led to believe that our values are the best, the western values are associated with progress, development, quick achievement, and hence are being readily imbibed by the students. It has to be understood that there is no particular set of values, which guarantees success and that the societal values must match with the organizational values and hence, values such as wisdom, humility, rationality, intellectualism etc. will have to be inculcated in education at all levels. In this context, our cultural values will need to be integrated with education.

Our performance in the field of education is not as satisfactory as envisaged as part of our developmental strategy. The previous sections have pointed out the gaps existing with respect to enrolment and attendance at all levels. At the same time the analysis has pointed to a significant growth from post independence period to now, clearly recognising the potential our country has with respect to development.

Against this background, the optimistic scenario suggests that India will have a well-established education system at the elementary, secondary and tertiary levels to be able to develop manpower for different levels of the economy. Having added 203 million to the population of the literates during the decade 1991-2001, India has demonstrable capability to reach near 100 per cent literacy level by 2025. The high rates of literacy in the rural areas, particularly among women, would encourage labour mobility from the agriculture sector to the more productive non-farm sectors. The managerial and financial skills required for the expanding and rapidly developing economy would be provided by the vibrant and matching tertiary education system.

Thus, it is important to aim at a radical transformation in this situation by giving highest priority to achieve the objective of Education for All. Elementary education would have become a fundamental right and the state would endeavour to ensure at least eight years of schooling to every child. Universalising access to elementary education and improvement of basic school infrastructure is the core objective for this. This would mean targeting the provision of one teacher for every group of 40 children for primary and upper primary schools, opening of a primary school/alternate schooling facility within 1 kilometre of every habitation, provision of free textbooks to all SCs/STs children and girls at the primary and upper primary school, management and repair of school buildings through school management committees, provision of opportunities for non-formal and alternative education for out of school children in the most backward areas and for unreached segments of the population in response to local needs and demands articulated at the grass root level. Steps would have to be initiated to fill up all the existing vacancies of the teachers through a time bound manner, with defined

responsibility to local bodies and communities, and to remove legal impediments in the recruitment of para-teachers.

All the above strategies can be put into place if the political will of the country is positive and the linkages of the education system with the community, the functioning of the institutions and other stakeholders is strengthened. With the policy largely taking into account the needs of the disadvantaged groups and the girls; India seems to be pretty strong on the political will. Considering the community readiness for education, its participation/mobilisation is not a problem. With the powers now being transferred to the PRIs, their participation will be attained in a much stronger way. Mere establishment of schools and hiring of teachers will not lead to an improvement in education if teachers remain absent as happens in many parts of the country, especially in rural areas. The participation of the local bodies (panchayats/local bodies), will therefore, help to monitor schools in a much better way.

With focus directed on disadvantaged girls and children through policy pronouncements and by agencies, it may be safely assumed that in 2025, in terms of access the gender gap will be substantially bridged. However, continuing poverty for some sections of the society and inaccessible schools will inhibit universal access and enrolment. Instead of eight years of schooling, perhaps, on an average, there would be only 5-6 years, majority of children of the landless wage earners, SCs and STs, muslims and those below the poverty line will be main sufferers. While enrolment may be near universal, retention will be difficult.

Although, quality may still be an issue if the systems are not adequately strengthened. While analysing the root causes for the current problems in the education sector, the role of institutions cannot be ignored. This is invariably linked to the quality issue in schools and universities. As per the status envisaged, most institutions lack motivation and rigour to contribute to the sector by taking on dynamic roles, thereby leading a neglected life. Thus, it will be important to make these institutions functional bringing about a qualitative change in the sector. A strong system will then be able to meet the requirement for teacher training for the additional teacher force and the required amount of teaching-learning material.

At the elementary level, currently this is being met out of DPEP for half the districts of the states and to cater to the requirement in 2025 these provisions will have to be increased. Thus, for quality education, provision of adequate academic support/training to all the teachers will be necessary. In this connection, the use of IT will also be explored in terms of teachers' capacity building as also for spread of literacy through television and media.

In 2025, the enrolment at the secondary and the senior secondary level will expand to take in almost all students desirous of pursuing further studies from the present level of gross enrolment ratio of about 60 per cent in the secondary level to about 75-80 per cent,

with almost complete access and retention in computer literacy. As per the present trend there is no significant rise in the enrolment of girls at this level, as well of the children from the disadvantaged and poverty-ridden areas. However, with the focus on this segment, in 2025 there would be greater enrolment of girls, SCs and STs, particularly in science, commerce and vocational streams. From about 48-50 per cent of the secondary school age girls being enrolled, the ratio would substantially increase and nearly match that of the enrolment of boys.

The rural areas will be deficient in computer literacy and thus, the quality of computer literacy for almost 60 per cent of the enrolled students in the secondary and senior secondary level will leave much to be desired.

There would be a heavy bias in favour of vocational and technical education, although in the Republic of Korea, Malaysia and Thailand employers and students are realizing that general education equips people for the demands of a modern economy integrated with the world trading system. There would be emphasis on quality and creativity. Science education would stress on experimentation, scientific enquiry and problem solving, making the school graduates more receptive to on-the-job training. Intellectual rigour, objectivity, spirit of enquiry and the ability to think, reason, analyse and to articulate logically would be the visible traits of the school graduates. While private schools would proliferate in both urban and rural areas, the use of distance education and the mass media would strengthen considerably.

However, this will be generally visible in the private schools where the cost of education will be higher. In the government and the government-aided schools, the quality of education will not be as high. Thus, the country will have two streams of students: a) the brighter graduates from private schools having potential to do perform well in academics b) the not so bright graduates from the government and the government aided schools excelling in vocational courses and lower rungs of technical and managerial functions. A developing economy needs both streams and therefore, they would complement each other.

With respect to the **Higher education**, from a level of 613 per 100000 population of enrolment in tertiary education in 1997 of which only about 30 per cent of the women enrolled were in the science stream, by 2025, India will be able to provide college and university education to about 40 per cent of the population in the age cohort of 18 to 24 years. The gender gap in enrolment will substantially get bridged and there will be an increasing percentage of female students in the technical, management, sciences and humanities. Engineering, medical, information technology and management education will be the choice of bulk of the students enrolled.

In order to cater to a huge demand several institutions will have to be set up. As per the status now, the cost being higher government is not able to set up many institutions since the 1980s, thus, limiting growth in this sector. Almost entire growth is in the private

sector. The university and higher education sector will need attention to improve the educational status of the country. This is also important in order to compete internationally. For this resources will be needed to create institutions.

Part of the problem facing universities is the inadequate provision of budgetary resources from the government. Since budget resources are limited and such resources as are available need to be allocated to expanding primary education, it will be important for universities to take greater efforts to supplement minimum resources from the government or from contributions from industry, constituting funds/trusts like the Bharat Shiksha kosh etc. Establishment of private institutions will be encouraged in order to compete internationally. There will however, be several problems related to establishing new institutions such as, the extremely high cost of setting up an institution, shortage of teachers, teacher salary not comparable to international standards etc. To combat these problems, alternatives such as distance education programmes, virtual classrooms, internet education etc. will be explored and there would be a paradigm shift in the delivery system of education through these means. This will bear a substantial stress on information technology and IT enabled services. The emphasis will be on individual initiative to get educated at the pace at which the individual sets himself, rather than the rigour of classrooms with limited reach and flexible schedules. The system will be flexible enough to meet the changing needs of rapid economic growth and shifting patterns of employment.

In the above context, focus on higher investments will be established. Since return of education is very high (About 40-45%), as compared to even other sectors and there is a demand to invest in education, there is a need to make investments through normal schemes and an efficient financing system. Various possibilities will exist in 2025, in this context: 1. Education development Banks to finance students and institutions through subsidized rates 2. The strategy of making contribution to the universities, with matching contribution from the universities for increasing investment or the contributions from the alumni's. Universities will have to adopt a marketing strategy to lure foreign students, mobilize resources and strengthen itself. This will act as a long term and potent instrument of international diplomacy.

In the area of Information technology, as projected in the earlier section, the growth of India will be over US \$ 100 billion by 2008, largely from IT services. As regards to the qualitative projections, IT education planning will needs to focus on how to increase quality in the tertiary IT education process. This is important as there is an acceptability of industry rising to 80 percent keeping in view that a large number of engineering graduates will continue to move into the IT workforce by doing bridge courses or through retraining programmes in industry.

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