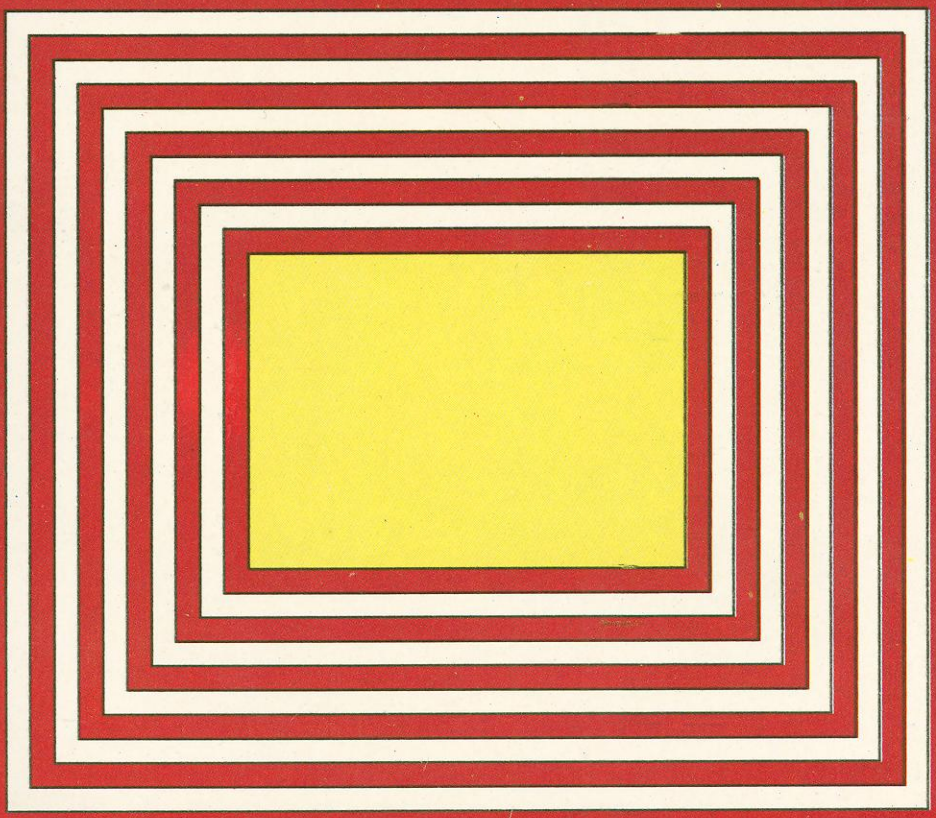
NATIONAL CURRICULUM FRAMEWORK FOR SCHOOL EDUCATION



National Curriculum Framework for School Education

राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING

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Preface

The Indian nation is striving to discover new and effective ways to educate its children and uneducated adults. An impassioned debate at the national and international levels has also been revived regarding the success of the educational endeavour in the context of all the people of all the communities regardless of their social, cultural and economic contexts. A universal urge to build a society of humane, committed, participative and productive citizens has accelerated these efforts.

India must review and update her educational concerns and priorities, too. The *National Policy on Education* (NPE), 1986 categorically stated that 'the implementation of various parameters of the New Policy must be reviewed every five years. Appraisals at short intervals will also be made to ascertain the progress of implementation and the trends emerging from time to time'. The *National Curriculum for Elementary and Secondary Education: A Framework,* 1988 was developed in response to the NPE, 1986 more than twelve years ago. It could not be reviewed earlier despite a clear statement in the Programme of Action (POA), 1992 that there was a need 'for its moderanisation keeping in view the increased emphasis on some issues of major concern, advance in knowledge and pedagogical considerations. The NCERT will be advised to initiate the necessary changes in the curriculum before the end of the Eighth Plan Period'. The Ninth Five Year Plan (1997-2002) document also expressed the concern for the review and updating of curricula to be taken up by the NCERT. Apart from taking heed to the message of these documents, the NCERT as a professional body also strongly feels that curriculum development is not a one-time venture but an on-going process that has to be sensitive and responsive to the entire gamut of societal, pedagogical and other changes at all levels. In fact, curriculum is a device to translate national goals into educational experiences.

In order to honour its commitment to the nation, the NCERT initiated work on developing a new curriculum frmework for the entire school education by constituting a Curriculum Group of its internal faculty members in September 1999. The Group developed *National Curriculum Framework for School Education*: *A Discussion Document* after consulting every faculty member of the Council, at the headquarters and the four Regional Institutes of Education, and also after studying relevant theoretical and research materials. Some eminent experts were invited to interact with the Group and other faculty members. Their rich contributions further helped the task of developing the document.

The *Discussion Document* was sent in January 2000, for perusal, comments and suggestions to the representatives of the numerous cross sections of the society, educationists, experts, teachers, university departments, research institutions, international bodies, bureaucrats and to anyone or everyone else who desired to have a copy. For a still wider dissemination, the complete document was put on the Council's web-site. This was followed by comprehensive debate and discussion throughout the country. A large number of regional and national seminars were organised and some others were sponsored by the NCERT for this purpose. Very many institutions, voluntary organisations, teachers organisations, parent-teacher associations, expert bodies and even students at the higher secondary stage discussed the document and offered their comments and suggestions. All these were very carefully looked into, analysed and thereafter used appropriately in the process of finalising the framework which now includes even the higher secondary stage of education for the first time.

The present curriculum framework reaffirms some of the major concerns raised in the NPE, 1986 and the *National Curriculum For Elementary and Secondary Education: A Framework, 1988*. These include issues related to language education and the medium of instruction, need for a common school structure for all the stages, the central issues of social cohesion, secularism and national integration and their relevance to the entire educational process. Some other concerns of the earlier documents have been elaborated in order to ensure the appropriate and adequate attention they

deserve. The common core components, continuous and comprehensive evaluation, the elements of freedom and flexibility and vocational education are some such concerns. The framework tends to provide a fresh look to certain issues like those pertaining to the minimum levels of learning, value education, the use of information and communication technology and the management and accountability of the system.

On the basis of years of observation and professional analysis, certain other concerns have either been reformulated or addressed partially differently with a view to ensuring better policy implementation. These include healthy, enjoyable and stressfree Early Childhood Care and Education, sustenance and nurturance of talent for securing excellence and the reduction of the curricular load. The present document also offers certain suggestions or recommendations in keeping with the rapid changes all around, but well within the spirit of the Policy. Integration of environmental education with languages, mathematics and other activities in the first two years of the primary stage, integration of art education, health and physical education and work education into the 'Art of Healthy and Productive Living' at the primary stage, education about religions, integrated thematic approach to the teaching of social sciences, integration of science and technology, bringing mathematics closer to life at the secondary level and setting up of a mathematics corner in the existing science laboratory for practical mathematics are some of these new elements. Besides, full trust in the teachers and their empowerment and participation in the planning, implementation and evaluation of the curriculum and development of the curricular materials is being asserted for the first time. Similarly, the orientation, participation and accountability of parents and community in general has also been suggested. Introduction of the evaluation of oral-aural language skills and individual and group self-evaluation are the other novel features of this document.

The education system of a country has to be built on the firm ground of its own philosophical, cultural and sociological tradition and must respond to its needs and aspirations. Indigenousness of the curriculum, therefore, is being strongly recommended. It has therefore stressed the need to get education rooted in Indian reality

and its composite culture. The awareness of India's rich intellectual and cultural heritage and of her contributions to the world civilisation along with those of other countries is strongly urged. A profound sense of patriotism and nationalism tempered with the spirit of *Vasudhaiva Kutumbakam* must also be infused into the students. That will strengthen and justify the young learners' self esteem as Indians. At the same time it also stresses the value of being receptive and open to all cultures and showing tolerance and respect for others. It is a small but an assured step to promote culture of peace and understanding and will help the nation to march ahead to new heights of national progress and prosperity. The need for preparing to face the chequered influences of globalisation in its challenging manifestations has also been duly asserted.

Finally, for transforming the proposed curriculum design into a vibrant reality, all the institutions involved in the delivery system shall have to come together with a firm commitment and secure optimal community support. A robust curriculum gets diluted and defused when the agencies implementing it have a tendency to maintain status quo or do not mobilise expertise to make contents of curriculum relevant and in tune with regional needs. The efforts backed by the result of curriculum research and the strength of a resolute politico-administrative will promise to ensure time bound implementation of the new curriculum in letter and spirit.

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New Delhi
November 2000

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CONSTITUTION OF INDIA

Chapter IVA

Fundamental Duties of Citizens

ARTICLE 51A

Fundamental Duties – It shall be the duty of every citizen of India —

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) To promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures;

(h) to develop the scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

Contents

1

Context and Concerns

Real education has to draw out the best from the boys and girls to be educated. This can never be done by packing ill-assorted and unwanted information into the heads of the students. It becomes a dead weight crushing all originality in them and turning them into mere automata.

Mahatma Gandhi (*Harijan*, 1 December 1933)

The task of building an enlightened, strong and prosperous nation rests on the shoulders of its children who are to be cherished, nurtured and developed with tenderness and care. Education has always played this important role and has thereby emerged as a natural characteristic of human societies. It has contributed to the shaping of the destinies of societies in all the phases of their development and has itself never ceased to develop. It has been the torch bearer of humanity's most noble ideals. In this sense, as an agent for social change, education necessarily reflects its main ethos, aspirations and concerns.

India had an advanced system of education and the world's first universities which presented a consummate example of education based on philosophy and religion and at the same time stressed the study of mathematics, history, astronomy, maritime and even the laws of economics and public administration. The *Chhandogya Upanishad* (Chapter VII, Section 1) mentions eighteen different subjects of study including areas such as natural disaster management, mineralogy, linguistics, science of elements, and science of defence.

The history of Indian education shows that encouraged by her great tradition of diversity, tolerance and humanism, various cultural and religious groups established their own educational institutions to suit their specific requirements. While some of these were of religious nature, the others imparted some kind of vocational education. The religious institutions provided for the development of the whole

individual — body, mind and spirit, infusion of a spirit of piety and religiousness, formation of character, development of personality, inculcation of respect for civic and social duties, production of social efficiency, and preservation and spread of national culture. As per the British Documents, even the early nineteenth century India had an extensive education system, free from caste and religious discrimination, and almost all the villages had schools.

Then the British introduced their educational system based on grant-in-aid to institutions to impart their kind of education to absorb the products in the civil services. In this scheme, very little of knowledge, attitudes and skills that the local people possessed was considered fit for educational use and was therefore totally discarded. Thus indigenous educational system suffered a set back, and the new system alienated Indian education from the wisdom, the belief and the value system of the people who were uprooted from their tradition.

School education in recent times has emerged as an important segment of the total educational system expected to contribute significantly to the individual as well as the national development processes. In order to do that effectively, it needs to be continuously reviewed and updated. In fact, curriculum development which is at the root of this renewal process, has to be seen as a permanent search for qualitative improvement of education in response to various changes in the society. A meaningful curriculum shall have to be responsive to the socio-cultural context of the country.

1.1 The Socio-Cultural Context

Characterised as one of the longest surviving continuum of cultures, India is a multi-cultural and multi-lingual society with a perennial undercurrent of essential unity. Its social base seems to be consisting of rocks of all the ages jumbled together by a series of seismic shocks. Thus the heterogeneity in social structures is a distinctive feature of the Indian society. Like the myriad species of plants and animals that make up the rich natural world, the large number of beliefs, religions and races inhabit one of the geographically most diverse countries. India's various ethnic groups form interconnecting loops, competing and cooperating while forming complex webs of interaction. Indian culture thus is a living process assimilating various

strands of thought and lifestyle. The process has created a rich collage of India exemplifying 'unity in diversity and diversity in unity'. This long tradition has been transmitted from one generation to another and it shows both continuity and change. In the Indian society collectivity had a traditional, agrarian ethos, which provided continuity. Conversely, the subsequent encounter with the western ethos generated discontinuities in the living process.

Traditionally, India has been perceived as a source of fulfilment – material, sensuous and spiritual, consisting primarily of an agrarian society, the social design of which emphasised self-sufficiency, contentment and operational autonomy for each village. The principles of non-interference and non-aggression were emphasised. The economic structure of the country was designed on the basic principle of the distribution of resources, not the distribution of income. The social matrix was congruent with the economic design based on the principle of distributive authority given to each village unit. Such a social design recognised the continuity of psycho-social relatedness, such as nesting of financial roles, as occupation and education in the social structure. Festivals, as part of the social infrastructure, were the most natural modes of expressing oneself and enjoyment. A religio-philosophic ethos, centred around self-realisation as the main purpose, allowed one to surrender oneself without any feelings of guilt or fear of punishment.

A sizeable segment of the contemporary Indian society, seems to have distanced itself from the religio-philosophic ethos, the awareness of the social design, and the understanding of the heritage of the past. Influenced by the alien technological ethos, the parents and the educational institutions emphasise the acquisition of high grade techno-informative knowledge alone. However, the impact of westernisation has been limited to only the elite members of the society, leaving the masses unaware of these developments. This has brought into a sharp focus the rural–urban, the agrarian – industrial, the affluent - destitute and the literate - illiterate divides. In this way, the structure of the authority of the Indian agrarian society has been disturbed. An individual in the formal work system could exercise authority over those who were otherwise his superiors in age and in the societal structure. In the agrarian society, successive

generations followed the occupation as well as the goal sets of the family or the caste at large. However, technological developments later introduced new professions, and consequently new goal sets emerged. In contrast to the joint and extended family system, the society now is witnessing the phenomenon of nuclear families, single parents, unmarried relationships and so on. The modern formal work organisations have generated peer groups and collaborative work patterns. The British system of education, which has continued in India even after independence, has contributed to this development. This was in sharp contrast to the work design of the agrarian society in which individuals by themselves could complete the entire work due to the simplicity and sequentiality of the technology. In the cultural sphere, major changes have been introduced by legislation which seek to abolish social inequalities and exploitation handed down by tradition and accord all democratic rights and constitutional privileges to all the members of society.

It is widely accepted that education, adequate in quality and scale, is the most powerful instrument for achieving goals of action and establishing social cohesion. Some of the important national goals are: secularism, democracy, equality, liberty, fraternity, justice, national integration and patriotism. It should also develop in the child a respect for human rights as well as duties. The weaker sections including scheduled castes/scheduled tribes, women, children with impairments and minorities can no longer remain underprivileged. Education must contribute to the enormous task of their upliftment and empowerment.

1.2 School Education Scenario

An important feature of educational development in India during the past several decades has been the sustained effort to evolve a national system of education. It was Sri Aurobindo who first of all, in the year 1910, visualised *A National System of Education*. Its main emphasis was on the nature and power of the human mind, the nature of simultaneous and successive teaching and the training of mental and logical faculty. Gandhiji's *Buniyadi Taleem* (Basic Education) as envisaged in the Wardha Scheme was another powerful indigenous model rooted firmly in the Indian soil. The

curriculum developed under this scheme aimed at the total development of the child, reflecting the Gandhian philosophy of education, i.e., the development of Body, Mind and Spirit. The fact that India could not implement it as a national curriculum indicated the magnitude and complexity of the problems involved in changing the established structure of education and the existing pattern of curriculum.

School education in post-independent India has passed through different phases. Soon after independence, the *Secondary Education Commission* (1951-53) was set up by the Government of India and it gave several recommendations for improving the quality of school education. In 1964-66, the *Education Commission* was set up, which brought out a more comprehensive document on education covering all stages and aspects of education as a whole. This was a major landmark in the history of the modern education system in India. Several recommendations of this Commission formed the basis for the National Policy on Education (NPE), 1968. The acceptance of a common school structure, i.e., 10+2 and a common scheme of studies as part of general education for 10 years of school throughout the country were important steps towards improvement in the school system. The NPE, 1968 envisaged 'a radical transformation of the education system to relate it more closely to the lives of the people, provide expanded educational opportunities, initiate a sustained intensive effort to raise the quality of education at all stages, emphasise the development of science and technology and cultivate moral and social values.' Then, the National Policy on Education, 1986, modified in 1992, stressed the need for evolving a national system of education based on a common educational structure (10+2+3), a national curriculum framework and the minimum levels of learning for each stage of education. For the first time, a detailed strategy of implementation accompanied by assignment of specific responsibilities and financial and organisational support was brought out in the form of Programme of Action, 1992. But, quite evidently efforts have fallen far short of these goals set in these documents. Though the country's achievements in a number of areas have been substantial in quantitative terms, these are not enough to provide a real breakthrough. Inspite of the constitutional provision for free and compulsory education upto the age of 14, the target of universalising

elementary education has not yet been achieved. The major challenges to India's goal of universal elementary education still remain the same: expanding access, arresting dropouts, raising learning achievements to an acceptable level of quality, and reducing gaps in educational outcomes across states and among groups. The nation has not yet reached the all important threshold of educational attainment where benefits are optimal and the high economic growth rates are sustained.

1.3 Curriculum Development : A Histrorical Perspective

An important development in the field of school education during the past four decades or so has been the professionalisation of curriculum development, syllabus design and the preparation of instructional materials including textbooks and their evaluation. The NCERT emerged as a nodal agency at the national level in the area of school education. It was involved directly in the process of curriculum development and preparation of textbooks. This was gradually followed by the establishment of the State Institutes of Education, State Textbook Boards, and the State Councils of Educational Research and Training for providing technical support to research and development activities related to the formulation of curriculum and the preparation of textbooks at the state/union territory level.

The publication of *The Curriculum for the Ten Year School – A Framework* in 1975, and Higher Secondary Education and its Vocationalisation in 1976 by the NCERT gave concrete shape to the efforts for restructuring of school education and the adoption of the 10+2 pattern as recommended by the *Education Commission* (1964-66). The NCERT then developed supporting syllabi and textbooks to be used as models by states and union territories. The *Curriculum* for the *Ten Year School: A Framework* (1975) provided an impetus to the teaching of environmental studies, science and mathematics as part of the general education curriculum from the primary level. The reorientation of science teaching first initiated through the introduction of the new curriculum and the development of the activity based instructional materials, gradually developed into a national movement for popularising science among school children.

The *National Curriculum for Elementary and Secondary Education: A Framework* brought out by the NCERT in 1988 responded to the major thrusts and recommendations highlighted in the *National Policy on Education* (1986) and the *Programme of Action* (August 1986) by incorporating the socio-cultural, political and economic considerations as well as some important pedagogical concerns.

The pedagogical issues highlighted in the *National Policy on Education* (1986) were also adequately reflected in the 1988 curriculum framework. Emphasis was also laid on continuous and comprehensive evaluation as well as on utilisation of media and educational technology. In its totality, the curriculum framework of 1988 has contributed to the development of a national system of school education by ensuring uniformity of levels and standards. In addition to this, realisation of the goals enshrined in the Indian Constitution was one of the major objectives of the 1988 curriculum. As in the year 1975, comprehensive guidelines were again developed for preparing detailed syllabi for different stages of school education. The state governments also took steps for developing their own curricula, syllabi and instructional materials.

The basic features and main thrusts of the 1988 curriculum framework stem from the policy documents on education (NPE 1986, and POA 1986). While briefly reviewing the implementation of the various thrust areas, one finds that improvement was evident in a number of areas like strengthening and restructuring of teacher education, National Literacy Mission, and improvement of Science Education in Schools, it is felt that much still needs to be done. Of the several thrust areas, only a few could be implemented and that too in a limited manner. A centrally sponsored scheme like 'Operation Blackboard' providing science kits, musical instruments etc. as a one time support should have created much better impact. Obviously, efforts for developing a national system of education as envisaged by the policy makers have to be strengthened further.

Over the last decade, changes in every walk of human endeavour have been much greater in magnitude and impact as compared to those during the earlier five or six decades. The educational and social demands have changed. In fact, education and learning have undergone a transformation. India and many other countries have

looked critically on their education systems and have come out with a frank and honest assessment thereof. The *Challenge of Education* (India, 1985), *A Nation at Risk* (USA, 1983) and *Learning to Succeed* (UK, 1993) have looked hard at their national systems of education. At the International level the UNESCO document (1996) *Learning : The Treasure Within* has also taken a critical look at the total educational scenario and made long range meaningful suggestions.

Within the ambit of systems and structures, curriculum design has an important role to play. It is generally accepted that in education, curriculum renewal and development is an ongoing process and no nation can afford to go slow in the matter. The curriculum must meet the learners' needs, societal expectations, community aspirations and international comparisons. Moreover, unlike the review of the *National Policy on Education* (1986) *and* the *Programme of Action* in 1992, *National Curriculum for Elementary and Secondary Education: A Framework* (1988) did not undergo any review since it was published and therefore the present exercise became imperative. This is in accordance with the recommendation of the Ninth Five Year Plan (1997-2002) document (p.123).

1.4 Curricular Concerns

Curriculum development essentially is a ceaseless process of searching for qualitative improvement in education in response to the changes taking place in the society. As such, it is not a static but a dynamic phenomenon. A meaningful school curriculum has to be responsive to the society, reflecting the needs and aspirations of its learners. Even in the new millennium, some of the country's important societal concerns would remain unchanged because these could not be addressed adequately in the past. At the same time, many new concerns have emerged in response to the fast changes in the social scenario of the country as well as the world. The curriculum has to lead to a kind of education that would fight against inequity and respond to the social, cultural, emotional, and economic needs of the learners. This would not be possible just with the element of mediocrity and ordinariness in the entire educational endeavour. Nothing short of excellence in every aspect of school education is the first imperative for meeting the multifarious challenges of today

and tomorrow. In other words, the curriculum must stand on the three pillars of *relevance, equity and excellence*.

1.4.1 Education for a Cohesive Society

Despite more than half a century of independence, India is struggling for freedom from various kinds of biases and imbalances such as rural/urban, rich/poor, and differences on the basis of caste, religion, ideology, gender etc. Education can play a very significant role in minimising and finally eliminating these differences by providing *equality of access to quality education and opportunity*.

Equality of opportunity means ensuring that every individual receives suitable education at a pace and through methods suited to her/his being. Children of the disadvantaged, and socially discriminated groups and also those suffering from specific challenges must be paid special attention.

Provision for equal opportunity to all not only in access, but also in the conditions for success is a precondition for the promotion of equality. The curriculum, it may be reiterated, must create an awareness of the inherent equality of all with a view to removing prejudices and complexes transmitted through the social environment and the factor of birth.

Education of Girls

Equality among sexes is a fundamental right under the Constitution of India. The State, however, also has the right to exercise positive protective discrimination in favour of the disadvantaged population groups including women. Emphasis in education has moved from 'Equality of Educational Opportunity' (NPE, 1968) to 'Education for Women's Equality and Empowerment' (1986). As a result, the curricular and training strategies for the education of girls now demand more attention. Besides, making education accessible to more and more girls, especially rural girls, removing all gender discrimination and gender bias in school curriculum, textbooks and the process of transaction is absolutely necessary. Moreover, it will be the most appropriate thing to recognise and nurture the best features of each gender in the best Indian tradition. After all, India gave her women the right to vote without any prolonged battle for it

unlike in the west. There is a need to develop and implement gender inclusive and gender sensitive curricular strategies to nurture a generation of girls and boys who are equally competent and are sensitive to one another, and grow up in a caring and sharing mode as equals, and not as adversaries.

Education of Learners with Special Needs

In its theory and practice, curriculum planning offers succinct means of actualising effective integration programmes in schools. Such efforts must identify and organise appropriate instructional objectives, content, materials, methods and evaluating devices for improved teaching experiences to follow the correction of imbalances as perceived by the children. A flexible educational system in desegregated schools accommodates wide ranges of learners' background and ability in designing improved learning experiences. The importance of individualising instruction for all learners with special needs recommends unit concepts as a succinct means to integrate educational experiences. Curriculum planning must interrelate the facets of classroom services, special support services and personnel and cocurricular activities in creating a new and vital programme which will facilitate curricular integration in its most specific situations.

Learners under this category have varied needs to be addressed. They ought to be given an opportunity to have access to curriculum throughout school span and to an individualised pedagogy. Teachers must make sincere efforts to develop a relationship and an atmosphere that would generate self-motivated, self-actualising, and self-monitored learning. Instructional materials need to be produced to create new conducive conditions and provide experiences to those who, because of *defacto* or *dejure* segregation of schools, are deprived of the opportunity to have direct learning experiences. The system must ensure the empowerment of learners with special needs and their parents by building partnerships with them and by involving them at different levels of the process of inclusion, i.e., right from the stage of decision making to planning of evaluation.

Equality in education requires personalised pedagogy, and a careful investigation into individual aptitudes. Compensatory and remedial

measures in education to suit the needs of the deprived, the disadvantaged and the challenged, with a view to bringing them at par with other students, assume central importance.

Education of Learners from Disadvantaged Groups

For achieving a cohesive society it would be essential to respond to specific educational needs of learners from different sections of the society with special emphasis on the Scheduled Castes, the Scheduled Tribes and the other socially and economically disadvantaged groups. In order to do so, there is a need for integrating the socio-cultural perspectives partly by showing concern for their linguistic specificities and pedagogic requirements. Implications of the multilingual and multicultural environment shall have to be taken care of through specifically devised methodology. Contextualisation of curriculum shall have to be effected through curricular materials. The fundamental rights of the disadvantaged groups have to be consciously incorporated in the curriculum. Even the problem of educating the migrating population shall have to be handled through specific condensed educational programmes based on the main ingredients of the national curriculum.

Education of the Gifted and Talented

An educational system has the dual role of promoting equality as well as excellence. Education is increasingly called upon to liberate all the creative potentialities of human consciousness. Man essentially fulfils himself in and through creation. It is in the context of this, that education of gifted and talented children assumes great importance. A curricular programme while on the one hand should identify such children, on the other it should also nurture their diverse creative abilities by paying them special attention. It is also important that the identification and nurturance begins right from the earliest stage of education. Moreover, the task of identifying the gifted and talented must be accomplished on the basis of a broad conceptualisation of the process from multiple perspectives rather than as a search for a unitary human attribute. Not only their IQ (Intelligence Quotient) but also their EQ (Emotional Quotient) and SQ (Spiritual Quotient) ought to be assessed. A suitable mechanism for locating the talented and gifted will have to be devised.

Education will also have to help the nation achieve social cohesion by preparing the young generation for 'learning to live together', a concept which in the Indian tradition has been hailed as *Sahridaya Sarvabhutanam*. Internationally, the idea of 'learning to live together' has been forcefully put forward in Delors Commission's, *Learning: The Treasure Within*. 'Learning to live together' requires ensuring that social conditions and prejudices within the society and the community are treated with utmost sensitivity and understanding by providing the right kind of experiences.

1.4.2 Strengthening National Identity and Preserving Cultural Heritage

The school curriculum must inculcate and nurture a sense of pride in being an Indian through a conscious understanding of the growth of Indian civilisation and also contributions of India to the world civilisation and vice versa in thoughts and deeds. Strengthening of national identity and unity is intimately associated with the study of the cultural heritage of India, rich with various hues. It is here that education has to play its dual role of being conservative and dynamic — bringing about a fine synthesis between change-oriented technologies and the country's continuity of cultural tradition. While on the one hand, education should help in promoting a global world order, on the other, it should be seen as developing a national consciousness, a national spirit and national unity essential for national identity. At no point of time can the school curriculum ignore the inclusion of specific content to forge national identity, a profound sense of patriotism and nationalism tempered with the spirit of *Vasudhaiva Kutumbakam*, non-sectarian attitudes, capacity for tolerating differences arising out of caste, religion, ideology, region, language, sex, etc. It is also important that along with the contributions of other countries to the world civilisation, India's contribution to world civilisation be also incorporated. It becomes necessary since many in India are not aware of the progress and achievement of the country in various fields including science and technology, not only the past achievements, but also the great potential of indigenous knowledge being of greater depth and relevance. For strengthening the unity and integrity of the nation it is essential that the cultural heritage, traditions, and history of the different ethnic groups and regions of

the country and their contributions are understood and appreciated in the right perspective. This shall help in truly understanding the nature of the country's pluralistic society and its composite culture.

The national spirit and the sense of national identity assumed great importance during the long saga of India's freedom struggle. As such, the study of this freedom struggle at all stages of school education shall continue to be significant. However, conscious efforts shall have to be made to acquaint the students with the events related to freedom struggle and the sacrifices made by the people in different parts of the country – from the North to the South, from the West to the East, as well as the regions like the North-East and the far flung islands.

1.4.3 Integrating Indigenous Knowledge and India's Contribution to Mankind

Today, even more than ever before, there is a world-wide recognition of India's indigenous knowledge systems. Ayurveda is being increasingly recognised as a holistic system of health and Indian psychology as a more complete discipline than the western. In this context it may be relevant to point out that there are domains of knowledge which could be called 'parallel', 'indigenous', 'traditional' or 'civilisational' knowledge systems. These belong to societies in the developing world that have nurtured and defined the systems of knowledge of their own, relating to such diverse domains as geology, ecology, agriculture, health and the like.

Education, in order to be relevant and meaningful must relate to the socio-cultural context of the students. An indigenous Indian curriculum would celebrate the ideas of the country's thinkers such as Sri Aurobindo, Vivekananda, Dayananda Saraswati, Mahatma Phule, Gandhi, Tagore, Zakir Hussain, Krishnamurti and Gijubhai Badheka. It would also rely on the innovative experiments and experiences emanating from its own context. Against this backdrop, it may be reiterated that along with the contributions of other countries, the contribution of India to the world wisdom also needs to be brought to general notice explicitly. Paradoxical as it may sound, while our children know about Newton, they do not know about Aryabhatta, they do know about computers but do not know about the advent of the concept of zero or the decimal system. Mention may also have

to be made, for instance, of Yoga and Yogic practices as well as the Indian Systems of Medicine (ISM) like the Ayurvedic and Unani systems which are now being recognised and practised all over the world. The country's curriculum shall have to correct such imbalances.

India's indigenous knowledge system must be sustained through active support to the societies and groups that are traditional repositories of this knowledge, be they villagers or tribes, their ways of life, their languages, their social organisation and the environment in which they live. There is a need for the innovative ways of preventing the attrition of such knowledge, which usually vanishes with the people, and it is here that education ought to play a very significant role. Equally importantly we need an indepth analysis of the parallelism of insights between the indigenous knowledge systems, on the one hand, and certain areas of modern science and thought concerned with the basics of life, on the other. Indigenousness, obviously, is not opposed to being receptive to new ideas from different peoples, cultures and cultural contexts.

1.4.4 Responding to the Impact of Globalisation

The country has to face a number of unprecedented challenges in the new century. One of these is the impact of phenomenon of Liberalisation, Privatisation and Globalisation (LPG) which is currently storming many parts of the world. Globalisation is an outcome of rapid and significant technological changes, geo-political evolution, and a dominant ideology of regulation by the market forces. It is characterised by essential factors like the emphasis on market led economies spreading across the planet, an accelerated increase in technological innovations, especially in the field of communications and the interdependence between these different dimensions. As a result of globalisation, most of the problems of universal nature do not stop at any one country's border posts, but call for world-wide solutions instead.

The phenomenon of globalisation, however, is not going to transform education completely. Education, therefore, has not to lose sight of its traditional basic goals; reading, writing, arithmetic and skill development. Globalisation may pave the way for more autonomy for individuals in a society of knowledge which would imply that

schools shall have to develop capacity among students to acquire relevant knowledge and inculcate and interpret new values that will, in turn, guarantee them the ability to remain up to date with the evolution of their environment.

Globalisation shall also underline a need for rebuilding the social links through education — at school and in non-formal environments — so that the desire for and the benefits of living together would be learned by learning to work in teams and the development of individual abilities. It will also promote the quality of learning to listen to others, to learn from the events which surround us and understand the economic, social and political environment, whether at a national or global level. Education should be the catalyst for the desire to live together in their own society on the one hand, and the global village on the other through the teaching of universal values such as tolerance and human rights, the diversity of cultures, respect for others and for the environment by searching for the right balance between the society's concerns and the integrity of the individual.

The main implications of the phenomenon of globalisation would be the emergence of learning societies due to the multiplication of the sources of information and communication, the transformation of the nature of work requiring more flexibility, the necessity of team work and the use of new technologies. The challenges created by globalisation for the educational processes would mean rethinking about the selection and delivery of educational content, integrating new sources of information, developing competence along with knowledge, adapting curricula to the needs of the different socio-cultural groups, and maintaining the national and social cohesion of the country. In the context of globalisation, learning to live and work together and the ways and means to develop it assume great significance.

Responding to the phenomenon of globalisation would lead to the discovery of a new scope for old disciplines such as history, geography, and foreign languages, and introduction of curricular concerns such as education towards active citizenship and human rights, environmental issues and the promotion of consensus on a common core of universal values.

1.4.5 Meeting the Challenge of Information and Communication Technology

The revolution in new technology ushers in a fundamental challenge, converting the information society into a knowledge society. Information and Communication Technology (ICT) can be summarised as the convergence of telecommunications, television and computers. The new technology has a tremendous potential to revolutionise education and transform school dramatically. It is hoped that the monopoly of formal education and the formal school will diminish with a lot of educational exposure and experiences being gained outside these institutions. The Teachers will become facilitators and libraries will be put to more and more use. The ICT is bound to influence and transform the existing educational provisions, changing the existing curricula, bringing in a new generation of learning materials and encouraging the networking of schools.

Integration of ICT into schooling would demand that the educational planners look beyond the current urban classrooms devising updated plans for education in an electronic environment even in the far flung rural areas and expanding their design so that the computer becomes more than a subject of study. It is not merely integrated into an existing curriculum — it becomes, instead, an integral part of the schooling process resulting in universal computer literacy, computer aided learning and finally, computer-based learning throughout the country. All innovative experiments in the areas of media production and the interactive video and multimedia computer software shall have to be perceived as integral components of the curriculum development process rather than external to it. It would necessitate the teachers' adopting an instructional design that helps the learner master heuristic and algorithmic strategies for tackling new problems as opposed to strategies aiming at the mastery of discrete units of some fixed knowledge.

It is not only the teaching style that would be influenced by the ICT but also the learning style. This would result in a shift from the traditional learning atmosphere to a climate of values that encourages exploration, problem-solving and decision-making and from the prescriptive classroom teaching to participatory, decentralised, interactive group learning. The traditional instructional methodology

would give place to strategies that unify knowledge, the mastery of fixed body of knowledge to understanding of a web of interrelations between parts of a whole, the linear sequential reasoning to search for patterns and connections and the collection of information to the processing of information. Evidently, therefore, the traditional tests cannot measure the skills and abilities resulting from this shift and hence there would be a need to replace them by comprehensive student portfolios and by assessment based on observational and situational tests.

However, a word of caution is necessary here. The gigantic strides of the ICT shall have to be judiciously directed so that only discreet healthy and healthful use of it in the classroom and outside is made. Effective devices to pre-empt the negative factors like its addiction, its use for uneducational and miseducational purposes, damage to the eyes and the harmful physical postures while using it must be carefully built in into the system.

1.4.6 Linking Education with Life-Skills

Education, by and large, suffers basically from the gap between its content and the living experience of the students. Education ideally must prepare students to face the challenges of life. For this, it needs to be intimately linked with the different life-skills, the abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life, by developing in them generic skills related to a wide variety of areas such as health and social needs. It is through these skills that students can fight the challenges of drug addiction, violence, teenage pregnancy, AIDS and many other health related problems. The skills would also make students aware of issues such as consumer rights, questioning the quality of goods and services available to them, writing to the manufactures, and civic authorities about the quality of goods and services that they expect. Besides, legal literacy and understanding of civic and administrative procedures would also be made available to the students to make their life simple, hasselfree and safe.

An important characteristic of life skills is that they are temporal and spatial in nature. Hence, they are required to be contextual. There

are certain core life skills, such as problem-solving, critical thinking, communication, self-awareness, coping with stress, decision-making, creative thinking and generative thinking, interpersonal relationships and empathy. These are of enormous importance for successful living.

1.4.7 Education for Value Development

The past five decades after, independence have witnessed constant erosion of the essential social, moral and spiritual values and an increase in cynicism at all levels. Although schools are not isolated islands untouched by the prevailing mood of indifference and even disregard for the entire value system, their potential for and role in the task of guiding the national psyche cannot be underestimated. Schools can and must strive to restore and sustain the universal and eternal values oriented towards the unity and integration of the people, their moral and spiritual growth enabling them to realise the treasure within. People must realise who they are and what is the ultimate purpose of human life. Self-recognition would come to them through proper value education that would facilitate their spiritual march from the level of sub-consciousness to that of super consciousness through the different intermediary stages. Value-based education would help the nation fight against all kinds of fanaticism, ill will, violence, fatalism, dishonesty, avarice, corruption, exploitation and drug abuse.

The National Policy on Education (1986) lays emphasis on equity and social justice in education to promote the country's unique socio-cultural identity and to contribute to national cohesion, promoting tolerance, scientific temper and the concerns enshrined in the Indian constitution. The recommendations of the Justice J.S. Verma Committee on Fundamental Duties of Citizens pave the way for strong commitment to basic human values and social justice. The core components of school curriculum as mentioned in the *National Curriculum for Elementary and Secondary Education — A Framework* (1988) are all the more relevant in the present scenario. The Constitutional Amendment incorporating the ten Fundamental Duties of Citizens is a valuable pointer to what the country expects of its citizens. All these must find a prominent place in the total education system of India including the school environs.

The School Curriculum in 1988 was designed to enable the learner to acquire knowledge to develop concepts and inculcate values commensurate with the social, cultural, economic and environmental realities at the national and international levels. The social values aimed at were friendliness, cooperativeness, compassion, self-discipline, courage, love for social justice, etc. Truth, righteous conduct, peace, love and non-violence are the core universal values that can become the foundation for building the value-based education programme as per the recommendations of the S.B. Chavan Committee Report submitted to the Indian Parliament in February 1999. These five universal values represent the five domains of the human personality — intellectual, physical, emotional, psychological and spiritual — are "correlated with the five major objectives of education, namely knowledge, skill, balance, vision and identity." (81st Report on Value-Based Education presented to Rajya Sabha on 26 February 1999, Item No.8).

Besides, curriculum in schools has to develop the key qualities like regularity and punctuality, cleanliness, self-control, industriousness, sense of duty, desire to serve, responsibility, enterprise, creativity, sensitivity to greater equality, fraternity democratic attitude and sense of obligation to environmental protection.

Another significant factor that merits urgent attention now is religion. Although it is not the only source of essential values, it certainly is a major source of value generation. What is required today *is not religious education but education about religions*, their basics, the values inherent therein and also a comparative study of the philosophy of all religions. These need to be inculcated at appropriate stages in education right from the primary years. Students have to be given the awareness that the essence of every religion is common, only the practices differ. The students should also be led to believe that differences of opinion in certain areas are also to be respected. The Chavan Committee (1999) strongly urges education about religions as an instrument of social cohesion and social and religious harmony. The UNESCO Department for Intercultural Dialogue and Pluralism for a Culture of Peace pleads for "Spiritual Convergence" and proposes to promote dialogue among the different religious and spiritual traditions in a world where intra and inter-religious conflicts

have become the order of the day (January 2000). It observes "that it is from early childhood that children should be introduced to the discovery of "otherness", and to the values of tolerance, respect, and confidence in the "other" that will bring about a change of behaviour and attitudes towards others. The introduction of specific teaching of intercultural and interreligious dialogue, through the adequate pedagogical tools, is conceived as a means to foster reciprocal knowledge of shared values contained in the message issued by religious and spiritual traditions, which can be considered as a common spiritual and cultural heritage".

However, a word of caution is required here. Education about religions must be handled with extreme care. All steps must be taken in advance to ensure that no personal prejudice or narrow minded perceptions are allowed to distort the real purpose of this venture and no rituals, dogmas and superstitions are propagated in the name of education about religions. All religions therefore have to be treated with equal respect (*Sarva Dharma Sambhav*) and that there has to be no discrimination on the ground of any religion (*Panthnirapekshata*).

1.4.8 Universalisation of Elementary Education

As per the Indian Constitution, the country is committed to providing free and compulsory education to all children up to the age of 14. This commitment has been reiterated in all the official documents during the past five decades. Efforts have been made to provide universal access to education including emphasis on universal enrolment and universal retention to arrest the dropout of children from schools. The initiative of *Sarva Shiksha Abhiyan* is an important step in this direction. All this would require the allocation of a higher portion of GDP to the education sector. The developed countries have already reached the stage where they normally allocate 9-10% of their GDP as government's spending for education.

Equality of the opportunity of access to education is necessary if more women are to become the agents of change. Therefore, education of women is an important key to improving health, nutrition and education in the family, and also empowering them to participate in decision-making. Investment, both in formal and non-formal

education of young children in general, and of the girl child in particular is expected to yield exceptionally high social and developmental returns.

In order to achieve the mission of universal elementary education, alternative systems, besides the formal school structure, may be promoted, because the education system needs to adapt itself to the requirements of the young learner. Reaching the still unreached, therefore, emerges as a major concern. It will require designing and developing new modules and delivery systems that would suit the needs of specific groups so as to ensure relevant and high quality basic education for every learner. Initial education meant for all, will comprise essential life skills and the potential for meeting the basic learning needs of all. This itself becomes an important concern of Universalisation of Elementary Education (UEE). It will have implications for curriculum in terms of the identification of basic learning needs, making provision for the minimum essential facilities, and providing for competent and qualified teachers who can ensure proper transaction of the curriculum to help children grow in a multi-dimensional manner. While there would be some identified competencies of universal nature to be acquired by all children, there would always remain scope for some competencies identified separately for varying contexts to meet the local specific challenges of life.

Parental education and community involvement toward achieving the goals of UEE would be a matter of concern for curriculum makers, planners and administrators and for all those concerned with the quality of education at the elementary stage. Since the involvement of the Panchayat Raj Institutions in elementary education has been ensured through a constitutional amendment, it would be desirable to get it streamlined and properly operationalised.

Thus, proper planning and its effective implementation is the soul of achieving quality education for all – the most cherished goal of UEE. Children at the elementary stage need to be equipped with proper attitudes and values along with necessary skills to help them emerge as social human beings, capable of contributing for themselves and the society at large and learning throughout life. While concerted efforts for this would need to be made in all the academic areas, the

issue of UEE will require a solid and unshakable politico-administrative will to achieve this goal.

1.4.9 Alternative and Open Schooling

Alternative schooling includes non-formal education, correspondence education and other flexible systems of education run by the government and non-governmental agencies. Non-formal education focuses on the students in the age group of 6-14, who are either not enrolled or have dropped out prematurely. Although substantial progress in this direction has been made during the past decades, a much greater amount of effort is required to achieve the national goal of UEE. Mere increase in the enrolment numbers is not enough. Retaining these students in the system and providing them meaningful learning experiences would be much more crucial.

Open schooling has now come of age. The country has one National Open School in Delhi and open schools in states catering to education at the elementary, secondary and higher secondary levels. These institutions have to be extended and enriched so that they can reach out to larger numbers of unreachable students, the out of school students, the dropouts and the students who cannot avail themselves of educational facilities because of their economic, social and geographical disadvantages. Multiple entries for students who have studied privately from mothers, senior/retired teachers and similar other members of the community, may have to be provided for. This would require valid certification through evaluation centres especially set up for this purpose. Both open learning and alternative schooling promote flexibility and learner autonomy and take into cognizance, learner convenience rather than the rigid academic and administrative systems.

In the Open School, there is no upper age bar for learners. A substantial number of students are in the age group of 15-35. On this ground, open schooling and alternative schooling for the age group of 6-14 and 15-35 have to be launched in a big way so that the significantly large number of learners who are outside the school net get educational opportunities. The scheme of studies and the academic standards in cognitive areas under alternative and open schooling should be, as far as possible, of a level comparable to

that for the students of the formal system. However, the instructional materials and transactional strategies under the two systems have to be different.

1.4.10 Integrating Diverse Curricular Concerns

The curriculum development process is often influenced by a 'panic approach' in which the local, national or international developments with some socio-economic and political bearing influence the decisions concerning the curriculum without prior, careful and structured planning. This 'panic approach' of including new and temporal curricular concerns may often lead to an overloading of the curriculum. Whenever such new issues crop up and demand attention, it must be examined whether whatever is already present in the curriculum could be of relevance, and could effectively incorporate those new issues. At a time when concerns such as 'literacy', 'family system', 'neighbourhood education', 'environmental education', 'consumer education', 'tourism education', 'AIDS education', 'human rights education', 'legal literacy', 'peace education', 'population education', 'migration education', 'global education' and 'safety education' are making a case for separate place in the school curriculum, the best approach would be to integrate these ideas and concepts, after a careful analysis in the existing areas of learning. Appropriate strategies for this integration may be suitably worked out in the detailed subject curricula.

1.4.11 Relating Education to World of Work

Work education and vocational education are an integral component of the school education system. The present policy relating to work education, as a purposeful, meaningful manual activity needs to be implemented more effectively at the primary stage. Work education is a thoughtful strategy to develop the understanding of facts and principles involved in various forms of work and to create a positive attitude towards work. It would help the country realise Mahatma Gandhi's dream of creating 'Thinking Fingers' for nation building. At the primary level, children can be involved in the observation of work situations, actual participation and also the production and preparation of a few articles. At the upper primary stage, the continuation of work education would reinforce respect for meaningful

work. In view of the maturity level of the students at the secondary stage, the activities now should become more varied and complex. These would prepare the students mentally to take up the vocational stream at the higher secondary level. In its final analysis the whole intent of work education is viewed as purposive and meaningful manual work, organised as an integral part of the learning process.

Efforts and initiatives in vocational education during the last decade have opened up ample learning opportunities some of which are crucial to future perceptions and planning. The social and community acceptability of the vocational stream has gradually risen, though not at the desired pace. In fact, success has been evident only in those areas where the initial exercise of planning and identifying the vocations was conducted with professional and sound understanding. In order to ensure success, attention shall have to be paid to local situations and the local master craftsmen that play a major role in the matter.

The scope and focus of vocational education must be extended beyond the organised sector of employment potentialities. Its model must accommodate the aspirations of the entire population. This alone would lead to a better educational transformation and provide avenues of the development of human potentialities that cannot be narrowed down to meet only the organised industrial sector. The focus has to be on the vast unorganised sector of self-employment. In order to ensure greater participation in the vocational stream of education, there is a need for incorporating sound components of work education in the curriculum at the secondary stage. Viewed in its totality, this alone would lead to the development of skilled manpower for a variety of activities.

The vocational or pre-vocational curriculum can lend itself to the possibility of organising concrete opportunities for students to collaborate for the good of the group, the class in general and for the school or the community at large. Tailor-made programmes to fit the dominant vocations of the area may be planned for this purpose. Many skills can be taught through services which benefit the community as a whole, bringing the school close to its environs and helping the students become aware of their commitments to the

school and the community. Cooperative activities can promote friendships, communal harmony and empathy for others.

All vocational education programmes and activities must stress the concept of sustainable development with a focus on fostering the awareness of the key environmental concerns and the rights of all to a decent standard of living.

1.4.12 Reducing the Curriculum Load

For a long time now there have been strong complaints from parents and community that the school curricula have become very heavy. The heavy load of curricula is not merely physical, but also one of non-comprehension resulting from the lack of understanding of some basic concepts. This has been causing a tremendous amount of stress and strain among students and thereby hampering their normal development. Efforts in the recent past were made to look into this problem and find out some ways and means to reduce the load on school students, particularly the young ones. However, despite several measures being suggested, the school curricula continue to be heavy and the expectations rather high. The problem must be addressed now in all earnestness.

The issue of curriculum load has its roots in many related issues. It cannot be wished away merely by downsizing the volume of the textbooks but has to be handled in its totality. One way to partly resolve the issue would be to take out the obsolete and redundant content without affecting the overall continuity of the concepts. The load can also be reduced by removing the mismatch between the developmental capacities of the children on the one hand and the curricular expectations and teaching learning methods on the other. Undue emphasis on homework, the memorisation of a large number of facts, as also overlapping concepts and topics in the syllabi will have to be removed. There also has to be a shift from the 'content' to the 'processes' of learning. Teaching shall have to be geared to making students 'learn how to learn'. This in itself has implications for both — the pre-service as well as the in-service teacher preparation programmes. The load can also be taken off by encouraging innovative evaluation practices which test the abilities like comprehension, application and analysis followed by timely

remediation. In order to find a practical and effective solution to this enormous problem, a holistic rather than fragmented approach would be the first requisite.

1.4.13 The Child as a Constructor of Knowledge

Children grow up in their own social worlds. As such, education, whether imparted in the formal institutional settings or otherwise, includes to a great extent social activity to transmit a social selection of knowledge. As opposed to the epistemic model of the children which does not provide a great scope for their social experiences, the constructivist movement has re-emphasised the active role children play in acquiring knowledge. The social construction of knowledge has been an important principle in the socio-cultural theory. The acquisition of knowledge through active involvement with content, and not imitation or memorisation of the material, is at the root of the construction of knowledge. In the constructivist setting, the learners have autonomy for their own learning, opportunities for peer collaboration and support, occasions for the learner generated problems that drive the curriculum, time for self- observation and evaluation and outlets for reflection. Autonomy encourages learners to construct their own knowledge and gain new perspectives through hands-on experiences rather than follow prescribed information. This perspective recognises the teacher as primarily a facilitator of learning. Rather than dictating what should be done, the facilitative teacher tends to act as a guide, providing resources for learners and enabling them to decide how to learn and why to learn.

The constructivist teacher follows no rigid prescriptions for successful teaching, acts as a facilitator of meaning — making rather than leader of all learning, adapts to a variety of contexts affecting schooling, and is deeply involved in the processes related to the purpose of education.

1.4.14 Interface between Cognition, Emotion and Action

Education must facilitate learners' personal growth and psychologically equip them to cope with the rapid changes taking place in all the spheres of life. Thus, the focus of education is moving away from providing mere cognitive skills (the traditional 3Rs) to fostering inter-personal and intra-personal development. Educators

are realising that besides academic deficiencies there is a different and more alarming deficiency: Emotional Illiteracy. The components of emotional intelligence or literacy include emotional and social skills, which relate to the education of moral and spiritual development and also have implications for the management and prevention of anger, aggression, truancy, alcohol or drug dependency, sexual abuse, and for resolving interpersonal conflicts. Intra-personal intelligence enables us to make sense of the things we do, the thoughts we have, the feelings we get — and the relationship between all these things. Interpersonal intelligence enables us to tune into other people, to empathise with them, to communicate clearly with them, to inspire and motivate them, and also to understand the relationships between the individuals. Education for promoting emotions needs to be recognised as an essential element of the educational process in the classroom since emotions provide information and direct attention, and facilitate the attainment of goals. Infact, for the teacher, emotions can become a valuable tool for the education of various reactions.

'Emotional Literacy' programmes directly alter the level of success, self-esteem and well-being of a person. They help reverse a tide of educational decline and thus strengthen schools. Nurturance of Emotional Intelligence, therefore, becomes a prime concern for schools and curriculum makers.

Curriculum thus has to provide learning experiences which help describe an individual's thoughts, feelings and actions. Multiple Intelligences (MI), as opposed to the traditional concept of intelligence which views every individual as a unique person and this uniqueness influences the various ways in which learning takes place. An idea like this which does not hold intelligence as a unitary concept but as a multiple attribute, promotes personalisation of education by connecting the learner's total life to the learning in the classroom. Multiple Intelligence recognises intelligence of various varieties such as linguistic, logical-mathematical, spatial, bodily-kinesthetic, musical, inter-personal, intra-personal and naturalist. It should be possible in an educational institution to develop these eight varieties of intelligence by providing the right kind of environment and experiences.

The Multiple Intelligence approach offers the learners many opportunities to explore significant concepts and topics and to think about them on their own in many ways, and to have many ways to make sense of what they find. The use of Multiple Intelligence in the curriculum provides for a variety of experiences that become the entry points into the lesson content and reach the learners in ways they can understand.

The multiple Intelligence education provides a framework that helps curriculum planners and also teachers to look for the varying levels of strengths of the learners, and develop the optimum range of their intelligences. As it provides for a variety of experiences, it offers to a larger number of learners the opportunity to succeed.

1.4.15 Culture Specific Pedagogies

India is a multicultural, multilingual and multireligious society. Every region and state has its unique identity. This would have implications for the pedagogical approaches to be followed in different contexts. Internationally, pedagogy is perceived not merely as a science of instruction but as a culture or as a set of sub-cultures as well which reflect different contexts and different teaching behaviours – inside and outside the classrooms. The pluralistic nature of Indian society needs to be reflected in the pedagogical approaches. Since there is no one universal way in which learners learn, there is a strong need for looking into the specific cultural context in which a learner is placed. Though all learners process information in roughly similar ways, the content of processing varies considerably from the tribal society to the high socio-economic stratum of the urban area. Pedagogy, therefore, should be culture specific. Instead of using one uniform, mechanistic way of teaching-learning, cultural practices such as story telling, dramatics, puppetry, folk play, community living, etc. should become a strong basis of pedagogy. Cultural specificity should get embedded in the pedagogical practices to be evolved for the tribal, rural, urban and other ethnic groups and communities. This would lead to joyful learning and the involvement of the school with the local people, their festivals, functions and life styles.

1.4.16 Development of Aesthetic Sensibilities

A shift from the traditionally oriented, cognitively focused approach of education to a more holistic education which places learning within the context of the learner's total experience rather than on only a part of experience has become necessary. An aesthetic approach to education attempts to restore an appropriate balance to the learning process by giving equal status to experience, imagination, creativity and intuition, as it does to knowing, thinking, remembering and reasoning. The aesthetic approach to curriculum would provide means for the activation of senses for the learner's new insights and understanding.

Aesthetic experience is potential in any area in which the individual interacts with the environment. Solving an algorithm, creating a sculpture, planting a garden — all can be sources of aesthetic experience. Since such experiences are emotionally complete and coherent and provide intrinsic satisfaction, they increase the likelihood of individuals' inclination toward subjects/sources through which they have been secured. Subject matters or disciplines, when addressed with aesthetic considerations, have in common the features of cognition, sensitivity to composition, attention to nuance, the need for flexible purposing, the exercise of imagination and the development of balance and harmony. Aesthetic education refers to developing learners' ability to have such experiences and must therefore be the concern of curriculum.

1.4.17 Continuous and Comprehensive Evaluation

Curriculum has to respond to the students' learning needs usually identified in terms of their personality development. Necessary inputs are provided to bring about changes in their personal and social behaviour besides developing in them the scholastic and co-scholastic aspects. With a view to providing feedback for further improvement, some kind of assessment or evaluation becomes essential. The outcomes of evaluation largely depend upon the identification of the types of tools employed for the purpose, the criteria of evaluation and the interpretation of the results. The relevance, reliability and validity of the evaluation procedures

determine the quality of the feedback, which has to be derived for ensuring qualitative improvement among learners.

While evaluation needs to be as realistic as possible, it has to be done in a cooperative spirit. Participatory and transparent evaluation can encourage learners to learn more and more and they may ultimately turn into lifelong learners. The fear of external examinations, settled in the minds of children from a very tender age, needs to be removed. Teachers will have to shoulder full responsibility of evaluating the progress of the children under their charge. Necessary training and assistance will have to be provided to them before making them accountable in the matter.

Continuous evaluation has to be done by teachers alone for which they need to be keen observers. This will, of course, be informal in nature. Further continuity of evaluation can be maintained through periodical assessments of learning to be utilised for diagnosing the areas of difficulty and arranging for remedial instruction.

Comprehensive evaluation takes a holistic view of learners' progress covering scholastic and co-scholastic aspects. The assessment of personality attributes including attitudes, habits and values of the learners has to be carefully recorded and they have to be helped to develop qualities necessary for becoming good and contributing citizens. Such assessments will also be recorded periodically and the cumulative record cards prepared.

The evaluation process ought to be demystified and made transparent by taking parents and community into confidence. Inter-learner comparisons should be minimised. The communication of the evaluation outcomes needs to be in a positive manner, which would encourage learners to offer themselves readily for evaluation rather than take it as an imposed ordeal. Competency for self-evaluation is to be inculcated in a gradual manner right from the early years. Attempts must be made to identity the evils of evaluation which have crept into the system, and eradicate them so that people's faith in the evaluation practices may be restored.

1.4.18 Empowering Teachers for Curriculum Development

The number of teachers playing an active role in designing the

curriculum is obviously very small, although as its implementers they make a very vital contribution to the educational process. It is for this reason that they are generally regarded more as 'conveyors' than designers of curriculum. The concept of school-based curriculum development is gaining popularity, and as the idea of decentralisation spreads to schools, the future would demand greater involvement of teachers in this process. This shall not happen unless they are really empowered for this changed role. The teachers of the nation must be trusted and trusted fully. The idea of an empowered teaching force has led to a redefining of teaching according to which it emerges as a more professional and reflective occupation.

For teachers to be potential actors in the change process, appropriate and adequate teacher education is essential, both in terms of preservice and inservice programmes. The latter have to be an integral part of the curriculum development process and must include training in both, the teaching methods and evaluation procedures.

Leaving teachers out of the design and development of curricular change is most likely to result in little, if any, real change in the scenario. Teacher involvement in curriculum development is desirable particularly because it can be a motivating factor for teachers in their profession, giving them a sense of 'ownership' of the curriculum they have to transact.

1.5 Education as a Lifelong Process

Education is a lifelong process with essentially two major dimensions — the temporal and the spatial. While it must continue through the whole life span of an individual since there are particular developmental tasks to be performed and problems to be solved, it, at the same time, takes place among different life spaces. These life spaces are the home, the school, the community and media, each playing by itself a very important role in the total development of an individual.

As a lifelong learner an individual develops an increasing awareness of the modern world, the changes occurring very rapidly in all walks of life, the phenomena of expansion and obsolescence of knowledge, and the changes in life-roles as well as psychological conditions at

the different stages of life. In order to facilitate this, the curricular areas or subjects of study are to be selected in such a manner that they provide a basis and choice for further education, both in general and professional fields. Special importance may have to be given to the mastery of an instrumental subject like one or two languages to develop communication and comprehension skills for further learning. In the process of the selection and organisation of content, emphasis needs to shift from specific bits of knowledge, which quickly tend to become obsolete, to those aspects which constitute the structures of the subject, the key concepts of the curricular area, and the tools and methods of inquiry specific to the subject. In other words, the curricular areas or subjects should be so designed that they provide the tools of inquiry, the basic starting points and practice grounds for acquiring the methods and tools of learning.

1.6 Toward a Frontline Curriculum

The world of today is witnessing developments and changes coming too fast and demanding our immediate attention. These would not wait for the normal ten or twelve year curricular cycle in order to be included in the school curriculum. Every learner in a dynamic learning society has to be familiar with such areas of knowledge in various disciplines of learning in the global context. In order, therefore, to keep the learners' knowledge base up to date, a small quantum is to be added to the regular curricular content every two or three years. Simultaneously, the redundant portions of information in the existing curriculum may be carefully deleted so that the exercise may not result in any additional curricular load for the learners.

Some of the learning areas that would deserve inclusion in this Frontline Curriculum right now could be the latest developments in communication system, space technology, biotechnology, genetic engineering, recent health issues, energy and environment, world geography, multinationals, archaeological findings and the like.

Initially, the teachers will have to learn how to be co-learners with the students, as the areas of the frontline curriculum will generally be new as much for them as for their students. Gradually, the students will

have to cultivate the habit and skill of self-learning and self-directed learning to acquire knowledge in the frontline curricular areas.

1.7 The Approach to the Curriculum Development Process

Curriculum development is a total process in which different components such as formulation of a curriculum policy, curriculum research, curriculum planning, its implementation and then its evaluation play an important role.

The impact of school curriculum is so crucial for national and state policies that in most of the countries of the world this responsibility is shouldered by various government and national level organisations and agencies. In fact, no country can afford to ignore the curriculum development process.

International experiences have shown that neither the completely centralised approach nor the totally decentralised approach to curriculum development has really been successful. The countries which at one point of time had tried the decentralised approach to curriculum development subsequently reverted back to some kind of a nationally developed centralised curricular policy. In view of this global experience, the most suited workable model of school curriculum seems to be one that could be labeled as the product of *coordinated decentralisation*, meaning thereby that while the broad framework gets developed at the central level, it goes to the states for analysis and study in their own contexts. In evolving the curricular policy the views and participation of all the stakeholders from parents to teachers and various other members and interest groups of the society are fully well ensured. The curricular framework generates creative thinking at various levels of decision making such as at the national, regional, state and district levels. It provides a great deal of flexibility to provide space for local specificity and contextual realities.

2

Organisation of Curriculum at Elementary and Secondary Stages

Context

The main thrust areas of Indian school education, as mentioned in the *National Curriculum for Elementary and Secondary Education : A Framework*, 1988, demand a fresh look. Some of these merit reformulation in the light of the country's experience in the field of school education and the others have to be re-affirmed. Some new thrust areas may also need to be added in the light of the changes all around. School education in the present scenario has to have the main thrust on the following :

- Inculcation and sustenance of personal, social, national and spiritual values like cleanliness and punctuality, good conduct, tolerance and justice; a sense of national identity and respect for law and order and truthfulness.
- Elimination of poverty, ignorance, ill-health, casteism, dowry, untouchability, and violence, and ensuring equity, health, peace and prosperity.
- Thinking, experiences and innovations which are rooted in the Indian tradition and ethos and relating these with global thinking.
- Establishing uniformity of structure of school education, i.e., 10+2+3 throughout the country.
- Broad-based general education to all learners up to the end of the secondary stage to help them become life long learners and acquire basic life skills and high standards of Intelligence Quotient (IQ), Emotional Quotient (EQ), and Spiritual Quotient (SQ).
- A common scheme of studies for the elementary and secondary stages with emphasis on the skill of 'learning how to learn' with flexibility of content and mode of learning to suit all learners including those with special needs.

- Inclusion of Fundamental Duties and the core curricular areas at all the stages of school education.
- Human Rights including the rights of the child, especially those of the girl child.
- Ensuring the minimum essential level of the acquisition of knowledge, understanding and skill at all stages, commensurate with the learners' abilities and the societal context.
- Freedom, flexibility, relevance and transparency in the selection of content, transaction and procedures at different stages of school education.
- Nurturance and sustenance of multiple talents and creativity among all learners in various domains of knowledge.
- Shift of emphasis from information-based and teacher centred education to process centred and learner friendly education.
- Development of a responsive and supportive system of evaluation.

2.1 Value Education

Since India is the most ennobling experiment in spiritual co-existence, education about social, moral and spiritual values and religions cannot be left entirely to home and the community. School education in the country seems to have developed some kind of neutrality toward the basic values and the community in general has little time or inclination to know about religions in the right spirit. This makes it imperative for the Indian school curriculum to include inculcation of the basic values and an awareness of all the major religions of the country as one of the central components.

Value education and education about religions would not form a separate subject of study or examination at any stage. These would be so judiciously integrated with all the subjects of study in the scholastic areas and all the activities and programmes in the co-scholastic areas that the objectives thereof would be directly and indirectly achieved in the classrooms, at the school assembly places, play-grounds, cultural centres and such other places.

A comprehensive programme of value inculcation must start at the very earliest stage of school education as a regular part of school's daily routine. The entire educational process has to be such that the boys and girls of this country are able to know 'good', love 'good' and do 'good' and grow into mutually tolerant citizens. The comparative study of the 'philosophies' of religions can be taken up at the secondary and higher secondary stages.

2.2 Common Core Components

The need for strengthening national identity is being felt now much more than ever before. As such there is a strong plea for promoting national integration, and social cohesion by cultivating values as enshrined in the Constitution of India through school curriculum. With this in view, the ten core components identified in the *National Policy on Education*, 1986 need to be reaffirmed. They are as follows: The history of India's freedom movement; The Constitutional obligations; the content essential to nurture national identity; India's common cultural heritage; egalitarianism, democracy and secularism; equality of sexes; protection of the environment; removal of social barriers; observance of the small family norm; and inculcation of scientific temper.

The Fundamental Duties as laid down in Article 51A of Part IVA of the Indian Constitution, also have to be included in the core components. These are to: (a) abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem; (b) cherish and follow the noble ideals which inspired our national struggle for freedom; (c) uphold and protect the sovereignty, unity and integrity of India; (d) defend the country and render national service when called upon to do so; (e) promote harmony and the spirit of common brotherhood among all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of woman; (f) value and preserve the rich heritage of our composite culture; (g) protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for the living creatures; (h) develop the scientific temper, humanism and the spirit of enquiry and reform; (i) safeguard public property and abjure violence, and (j) strive

towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement.

These core components need to be integrated in school curriculum in a suitable manner. It is envisaged that they would help in instilling a nationally shared perception and values and creating an ethos and value system in which a common Indian identity could be strengthened.

2.3 Toward an indigenous Curriculum

In order to make education a meaningful experience, it has to be related to the Indian context. Now, more than ever before, there is a realisation of the fact that by intellectual standards, India cannot flourish merely by importing or borrowing what is happening abroad, or by showing proficiency in solving problems that have been faced abroad.

In concrete terms, this shift in thinking calls for evolving an approach to curriculum preparation based on thinking, experiences and innovations rooted in its indigenous tradition. While doing so adequate attention shall have to be paid to the country's cultural plurality and the enormous amount of wisdom and experience that can be drawn from the various regions and sections of the Indian society. It may also mean making judicious use of and drawing from traditional knowledge systems and solutions to issues of health, water management, population explosion etc. At a time when there is worldwide recognition and patenting of items like *neem* and turmeric, this kind of information must become an integral component of learners' knowledge. It is also desirable that learners are introduced to the advances made by the country in the past in various areas of knowledge. Besides, the knowledge and appreciation of folk cultures, songs, traditional dance forms, costumes, and musical instruments must become part of the school curriculum.

2.4 The Minimum Levels of Learning

In order to ensure access to the education of a comparable standard to all learners irrespective of caste, creed, location or sex, the concept

of the *Minimum Levels of Learning* (MLLs) has emerged as one of the basic concerns. An effort to combine quality with equity, keeping in view the developmental needs of learners from all the sections of society including the disadvantaged and deprived ones, the dropouts and the working children and girls, has generated a need for identifying certain essential levels of learning for each stage of school education. These have been called the Minimum Levels of Learning. The MLLs are expected to be achieved by one and all. Since the MLLs provide a sense of direction and a certain amount of accountability, these are considered to be an effective tool for programme formulation for school improvement. The quality of a school or educational system, in real sense, has to be defined in terms of the performance capabilities of its students. The Minimum Levels of Learning can be stated in a variety of ways to specify the learning outcomes. One of the important ways of doing so is to state MLLs in terms of competencies. Whichever approach is followed, the specification of the MLLs should meet the purpose of enhancing the learning attainments and serve as performance goals for the teacher and output indicators for the system. Accordingly, the MLLs must have, apart from relevance and functionality, the attributes of achievability, understandability and evaluability. Learning has to be seen as a 'continuum' in which units are sequenced in a functional manner. The approach must help the learners progress systematically through this continuum by mastering the specified sets of competencies in each unit before moving on to the next one. Learning each subsequent unit will then be enjoyable and meaningful.

The concept of the MLLs is holistic rather than fragmentary in nature. MLLs should be envisaged as learning outcomes to be achieved at the end of a particular stage. Specifying further details and their gradewise sequencing need not be considered as a rigid prescription. The concept provides enough room for flexibility. The marshalling or sequencing of skills representing learning outcomes is to be done in such a way that it involves in a balanced manner the analytico-synthetic processes. Moreover, 'learning' is to be understood in the broader sense of 'skill', 'quality', 'attitude', and 'value' too. That way, the term would embrace all the cognitive, psychomotor and affective area learning outcomes of education. The emphasis on defining the MLLs highlights the importance of the integrative nature of learning

and evaluation to ensure effective diagnostic interventions and assessment procedures. Thus, the MLLs do not merely serve as the indicators of a learner's progress or guide evaluation alone, these also help in identifying the appropriate sequencing of learning, suitable transactional processes and desirable assessment techniques which would enable a teacher to provide remedial teaching on the one hand and enrichment programmes on the other as per the needs of individual learners. Teachers can get very specific clues for organising peer learning, goal directed learning and encouraging self-learning in a conscious and concerted manner.

The MLLs approach is based on the elements of mastery level learning, child-centred and activity-based teaching, continuous and comprehensive evaluation, diagnostic and remedial teaching, differential treatment to optimise achievement levels of all and action research. All these elements need to be practised to achieve the goal of quality elementary education for all.

Emphasis has been laid on the introduction of the MLLs and the adoption of a common scheme of studies at the different stages. Simultaneously, flexibility is envisaged in the selection of strategy for curriculum transaction. This will make learning relevant to the needs and environmental contexts of the learners and allow scope for initiative and experimentation on the part of the teacher, the school and the local educational authorities. However, the scope for flexibility in the methodology and approach to curriculum transaction is not expected to be used for introducing differential courses or similar measures which would create disparities in the standards of education in different parts of the country.

2.5 General Objectives of Education

Education liberates human beings from the shackles of ignorance, privation and misery. It must also lead to a non-violent and non-exploitative social system. School curriculum, therefore, has to aim at enabling learners to acquire knowledge, develop understanding and inculcate skills, positive attitudes, values and habits conducive to the all-round development of their personality. Young girls and boys, are to be empowered through education to increase their capability. Paradigm shifts are therefore necessary to support a

curriculum that values the interaction of the process and the content. Besides, the development of intrinsic values and the emotional intelligence of learners is also crucial.

School curriculum has therefore, to help to generate and promote among the learners:

- language abilities of listening, speaking, reading, writing and thinking and communication skills – verbal and visual-needed for social living and effective participation in the day to day activities;
- mathematical abilities to develop a logical mind that would help learners perform mathematical operations and apply them in every day life;
- scientific temper characterised by the spirit of enquiry, problem-solving, courage to question and objectivity leading to elimination of obscurantism, superstition and fatalism, while at the same time, sustaining and emphasising the indigenous knowledge ingrained in the Indian tradition;
- understanding of the environment in its totality both natural and social, and their interactive processes, the environmental problems and the ways and means to preserve the environment;
- understanding of the diversity in lands and people living in different parts of the country and the country's composite cultural heritage;
- appreciation of the sacrifices and contributions made by the freedom fighters and social workers from rural, tribal and weaker sections from all the regions of the Indian society, particularly from the North-East and the Andaman and Nicobar Islands, in India's freedom struggle and social regeneration, and readiness to follow their ideals;
- appreciation for the need of a balanced synthesis between the change oriented technologies and the continuity of the country's traditions and heritage;
- knowledge of and respect for the national symbols and the desire and determination to uphold the ideals of national identity and unity;
- deep sense of patriotism and nationalism tempered with the spirit of *Vasudhaiva Kutumbakam;*

- understanding of the positive and the negative impact of the processes of globalisation, liberalisation and localisation in the context of the country;
- qualities clustered around the personal, social, moral, national and spiritual values that make a person humane and socially effective, giving meaning and direction to life;
- knowledge, attitude and habits necessary for keeping physically and mentally fit and strong in perfect harmony with the earth, water, air, fire and the sky;
- qualities and characteristics necessary for self-learning, self-directed learning and life-long learning leading to the creation of a learning society;
- capacity not only to process information but also to understand, reflect and internalise and develop insight;
- willingness to work hard, enterpreneurship and dignity of manual work necessary for increasing productivity, obtaining job-satisfaction and creating wealth generating systems;
- acquisition of pre-vocational/vocational skills;
- appreciation of the various consequences of large families and over population and need for checking population growth; and
- cultivating proper understanding of and attitude toward healthy sex related issues and respectful attitude toward members of the opposite sex.

The emphasis on the 'learner-centred approach' necessitates careful determination of the objectives of education to be achieved at a particular stage/class in keeping with the norms of physical, mental, social, and emotional development of the learners of the relevant age-group. However, the level of achievement with regard to a particular objective will be rising from one class to another in a spiral fashion.

2.6 The Learners' Profile

Learners are not passive objects. They are active and inquisitive persons. It is not that only the environment shapes them, rather they too shape the environment to a great extent. The learners do not

come to school with a blank mind but with pre-conceived ideas. Their classroom experiences are interpreted in the context of these pre-conceived notions. Thus, the prior experiences, beliefs and emotions affect the individual's perception and interpretation of events. This knowledge acquisition is a constructive or generative process and each student's knowledge is personal and unique.

For long, the child or the learner was viewed as a natural or given category. This undermined the importance of the fact that the development of the learner is intimately linked to changes in the socio-cultural and historical conditions in a given society. Thus, differences across groups and changes within a group may affect the nature of the learning. As such, a monolithic view of the learner and learning is untenable. On the other hand, an integrated approach for understanding the characteristics of learners seems appropriate and helpful.

During the pre-primary stage, enormous changes take place in the children's physical growth and mental development. From a state of dependence and helplessness the children gradually attain independence and become curious learners. As their bodies grow and respond to the social and cultural cues, their nervous systems mature and their cognitive experiences are enhanced. They quickly adapt to the world and slowly begin to imagine and discover methods for storing away the memories of the past and present events. Play fosters the overall development of the learners who may engage in functional play, i.e., simple and repetitive movements with or without an object, and constructive activity— physically manipulating objects in order to construct or create something . This period is marked by the development of language, the use of symbols and egocentric thinking, i.e., failure to distinguish between one's own point of view and that of another individual. Children at this stage also engage in fantasy play.

When children enter the primary stage their physical development seems to slow down and becomes less eventful. They become slimmer, more muscular and master new skills which enable them to compete effectively against their peers. Depending upon the children's eco-cultural system and developmental niche, which emphasises different motor skills, children now become better

coordinated. Their thinking is governed by the fundamental rules of logic. Here, the concept of the *zone of proximal development* (ZPD) acquires significance. The ZPD refers to the distance between a child's actual development level and the higher-level potential. It is the difference between what children can achieve independently and what their potential level of development might be if given help or guidance. The cognitive capacities of the learners are enhanced when instruction is focused on individual potential rather than on the level of their actual development. This concept strengthened the view that social influences contribute significantly to the development of children's cognitive abilities and mentoring or guidance facilitates their development. From egocentric speech (which serves to control one's own behaviour, and is usually verbalised), the children move on to inner speech which consists of self-talk. During this phase children rehearse what they are going to say before actually saying it. Their social development is regulated by the peer group. In the company of their peers, children learn to cope with everyday conflicts, anxiety and fears through fantasy play. Interaction with peers also gives them social values of cooperation and sharing.

At the upper primary stage, several physical changes take place in children as it is a period of biological transition from childhood to adolescence. At the cognitive level, the children are gradually able to think logically in terms of all the hypothetical situations related to a particular problem. They also endeavour to establish an identity of their own. The process of identity formation requires taking into account one's own view as well as the views of others and of the society. Thus, the importance of the peer group increases considerably. The children now experience frequent mood swings and conflicting thoughts.

At the secondary level, the characteristic developments that have taken place during the upper primary stage get strengthened. Thinking with abstract concepts, establishing social identity, and giving importance to the peer groups increase all this considerably. Therefore, at this crucial stage it is also necessary to promote social interactions among children. For effective learning and for intellectual development, learners have to cooperate with their friends, share their experiences, discuss their discoveries and argue out their differences of opinion.

Characteristics other than the intellectual ones also provide important guidelines for designing curriculum which could be geared to the all-round development of the learners as individuals, and their development also in the context of the national goals and the socio-cultural priorities. Learners' physical, social and emotional characteristics, attitudes and interests that emerge in them during childhood, early adolescence and mid-adolescence, should be carefully taken into consideration while determining the objectives, content and strategies of curriculum and its transaction at the pre-primary, primary, upper primary and secondary stages.

For the development of beliefs, habits and attitudes associated with physical well-being, emotional maturity and proper social orientation, the years of pre-primary and primary education are the most impressionable and formative period of the child's life. This fact has to be realised in all seriousness by the curriculum designers and practitioners so as to provide appropriate and adequate learning experiences to the learners.

By the time children enter school, they have in the normal course, already developed a readiness for participation in group life with their peers. However, a discerning outlook toward social conventions and social events, and appreciation for lofty social ideals are yet to emerge in them. Similarly, though they begin at this stage to distinguish between the right and the wrong, they have not as yet developed the higher moral ideals involved in the process. The children demonstrate in their behaviour a desire not to depend on others, but the crystallisation of this desire takes place gradually through the years of secondary education. In the normal course, learners, during the secondary stage of education, are expected to develop a philosophy of life that would provide them appropriate motives and directives of behaviour as future adults. Toward the end of the upper primary stage, the learners start critically evaluating the contradictions they observe in the words and deeds of individuals and the society. The awareness that one needs to stand on one's own and choose an appropriate career is normally reflected in the learner's behaviour.

These developmental features indicate the need for gradual introduction of learning experiences related to ideas, attitudes and

skills associated with moral values, national ideals and priorities, socio-cultural cohesion and global fraternity. Systematic provision of information and guidance that would help the youth in making right choices of career and vocation for themselves must be ensured toward the end of the upper primary stage and particularly during the secondary stage of education. For a large number of students, some kind of orientation to work education may be required as a part of their curriculum during the secondary stage.

During the period of secondary education, emergence of desire and inclinations of sexual nature is a normal feature of students' psycho-physical development. This dimension deserves careful attention of the curriculum organisers. The idea that the Indian society does not approve of promiscuity and that self-control or '*Samyam*' is one of the highly valued qualities ought to be underlined. This will generate among the youth healthy attitudes toward sex and respect for members of the opposite sex.

Curriculum designers could hardly afford to overlook the emotional dimensions of the child's life during the school period and the importance of emotional maturity in the life of a person. It is only gradually, through growth, that the child achieves emotional stability and emotional independence. There are occasions, particularly toward the end of upper primary and during the secondary education, when the learner has to face intense stress and strain which may result in emotional crisis. Curriculum should provide for appropriate activities and experiences, of scholastic and co-scholastic nature, and counselling and guidance in this regard.

2.7 Scheme of Studies

The general objectives of education will be realised through the content and learning experiences related to different subject areas. However, the emphasis would shift from factual knowledge to the process of understanding, thinking and internalising. Toward all-round development of personality, value education, health and physical education, art education and work education, have to be given appropriate importance in the school curriculum. The inter-connections among various subject areas have to be clearly established. A common scheme of studies, therefore, is advocated for Classes I to X.

The core component areas and values shall form an integral part of the curriculum at all the stages and may suitably be integrated in different subject areas. Flexibility in the selection of content and organising learning experiences must be inbuilt in the system.

2.7.1 Early Childhood Education (ECE)—Preparation for Primary Education (2 years)

This stage of education helps in preparing children for school and constitutes an important element of Early Childhood Care and Education (ECCE). It is available as a pre-school education component under Integrated Child Development Scheme (ICDS) through a net working of '*Anganwadis*'. It is also available in various other forms such as preparatory schools, nursery and kindergarten classes etc. both in private and government sectors in varying degrees. It is to be realised that the experiences to be provided at the very beginning of education play a very crucial role in the development of child's personality and have strong bearing upon later education of children. Learning at this stage may be characterised by group activities, play–way techniques, language games, number games and the activities directed to promote socialisation and environmental awareness among children. Accordingly, pleasure, perception and participation need to be duly emphasised. It will ensure readiness to learn among children and reduce unhealthy and harmful load on children whose neuro-muscular capacities are not yet adequately developed. Formal teaching of subjects and reading and writing must be clearly prohibited. ECE needs to be made uniformly available to all children of the country to ensure equity.

During this period there should be more and more opportunities to use the language orally and listen to it in the natural interactive mode. Children should be provided with ample opportunities for developing essential skills of identification, comparison, matching, naming, seriation, drawing and counting without subjecting them to formal ways of learning numbers etc. With a view to instilling social awareness among children, child to child interaction and child nature interaction be promoted besides organising activities helpful in developing positive attitudes, and habits for healthy social participation. They should be encouraged to play with pets, knowing

common birds, animals, plants and means of transport and some celestial bodies such as sun, moon and stars.

2.7.2 Elementary Education (8 Years)

Primary Stage (5 years)

Primary stage of education has been visualised in two segments with inherent internal continuity. The first segment comprises Classes I and II, where children are just introduced to formal teaching and are at a stage of development which requires a smooth transition from informal and non-formal environment to a formal one. The second segment consists of Classes III-V wherein the children get prepared to understand the environment and learn in a systematic way. The scheme of studies for these two segments is given below:

A. Classes I and II

(a) One Language — the mother tongue/the regional language

(b) Mathematics

(c) Art of Healthy and Productive Living

Experiences to be provided in areas (a) and (b) will constitute an integrated whole taking into its fold, the natural and the man-made environment. Teaching and learning of language and mathematics would be woven around the environment of the learners and integrate environmental concerns as well.

Experiences to be provided for art of healthy and productive living will further contribute toward all-round development of the personality of the child. These will be organised keeping child in central focus involving students in activities commensurate with their developmental stage. Activities related to health will get a prominent place so that children acquire necessary skills, attitudes and habits to keep themselves healthy and participate in games and sports suitable for their age. Children will be initiated into preliminary yogic exercises and will be exposed to various soothing experiences in the field of music, drama, drawing and painting and clay modelling. In organising these activities local factors may be given due importance. They will be encouraged to participate in creative activities such as free hand drawing

and painting. Besides this, children will be involved in the activities related to work education so as to enable them to be free from inhibitions and like to work. For value inculcation stories and anecdotes would play an effective role. These will also generate and strengthen the element of curiosity, imagination and a sense of wonder. All the experiences will need to be presented in an integrated manner for which themes will be identified and teachers will make use of locally available resources and harness community support wherever necessary.

B. Classes III to V

(a) One language — the mother tongue/the regional language

(b) Mathematics

(c) Environmental Studies

(d) Art of Healthy and Productive Living

Children will be provided with experiences to help their socio-emotional and cultural development with a realistic awareness and perception of the phenomena occurring in the environment. This may be accomplished by emphasising, observation, classification, comparison and drawing of inferences through activities conducted within and outside the classroom. The integrated approach would be most suitable to achieve the desired objectives.

The experiences gained earlier will be further strengthened by ensuring participation of all children in the activities related to music, dance, drama, drawing and painting, puppetry, health and physical education, games and sports, yoga and productive work. Integrated approach will be used. Autonomy and flexibility incorporating the locally developed curriculum and materials will be encouraged. Concerted efforts will be made to ensure proper value orientation among children.

Upper Primary Stage (3 years)

(a) Three Languages — the mother tongue/the regional language, modern Indian language and English

(b) Mathematics

(c) Science and Technology
(d) Social Sciences
(e) Work Education
(f) Art Education (fine arts: Visual and Performing)
(g) Health and Physical Education (including games and sports, yoga, NCC and scouting and guiding)

Secondary Stage (2 years)

(a) Three Languages — the mother tongue/the regional language, modern Indian language and English
(b) Mathematics
(c) Science and Technology
(d) Social Sciences
(e) Work Education
(f) Art Education (fine arts: Visual and Performing)
(g) Health and Physical Education (including games and sports, yoga, NCC and scouting and guiding)

2.8 Curricular Areas at Different Stages

Imaginative and discreet planning of appropriate learning experiences makes it possible for the curriculum objectives to be realised. Well planned activities and teaching-learning strategies facilitate these experiences which ought to make an integrated whole. However, for the sake of convenience, these have to be classified under various subject areas. The nature of various stages of education and the learners' profile have their bearing on the planning of objectives, learning activities and strategies under each curricular area. The curricular areas and their stagewise treatment for this purpose are proposed as follows:

2.8.1 Language

Language learning at the primary stage is crucial to not only meaningful learning in all the subject areas but also to the learner's emotional, cognitive and social development. New entrants with poor

language background remain poor learners and poorer performers in all areas unless specially helped in language skills. Failure to teach language skills properly and adequately in the early years will lead to difficulties in learning subsequently through the upper primary, the secondary and the higher secondary stages. Language education has the greater potential as a means to develop, progressively through various stages, attitudes and values related to all the core components by incorporating appropriate themes and adopting suitable teaching learning strategies.

Language education must aim at encouraging independent thinking, free and effective expression of opinions and logical interpretation of the present and the past events. It must motivate learners to say things their way, nurture their natural creativity and imagination and thus make them realise the basic difference between their verbal language and the language of Mathematics. These are the reasons why learning of language ought to find a central place in the total educational process.

In this context the following focal points merit serious consideration:

- Despite general acceptance of the central importance of language education in principle, practical effort for improving it has yet to be made at all levels in the country.
- The oral aspect of language has to be duly emphasised in language education and oral examination in language must be made an integral part of the evaluation process.
- Emphasis will have to shift from the teaching of textbooks to extensive general reading and it would need continuous guidance and monitoring.
- Due stress is to be laid, in all language education programmes, on the ability to use the language in speech and in writing for academic purposes, at work place and in community in general.

2.8.2 The Three Language Formula

Even about four decades after the formulation of 'Three Language Formula', it is yet to be effectively implemented in true spirit. Despite all the changes in the socio-economic scenario, market pressures and the behaviour pattern of the Indian youth, the three language formula still remains relevant.

Under this Formula:

- The First language to be studied must be the mother tongue or the regional language
- The second language —
  (i) in Hindi speaking states will be some other modern Indian language or English, and
  (ii) in non-Hindi speaking states will be Hindi or English.
- The Third language —
  (i) in Hindi speaking states will be English or a modern Indian language not studied as the second language, and
  (ii) in non-Hindi speaking states will be English or a modern Indian language not studied as the second language.

Since the basic objective behind the Three Language Formula was, and continues to be, national unity and facile intra-state, inter-state and international communication. adherence to it must be ensured by the Central as well as State/Union Territory governments. Minor modifications in the formula and its implementation in complex linguistic situations, as in some north-eastern states for example, could, however, be allowed as per the needs and discretion of these states and within the overall spirit of the formula.

Every child's mother tongue or regional language has to be taught right from the first standard. In the cases where the children's home language is different from the school language or the regional language, gradual and smooth transition to the regional language is to be effected within a reasonable time at the primary stage itself. In states where because of plurality of regional languages the official or the associate official language of India has been accepted as the state language or first language, it will have to be taught from the first standard. Provision for the teaching of mother tongue would be made for children from linguistic minorities wherever they are in adequate numbers.

As per the earlier Curriculum Framework (1988), "if resources are available for teaching the second language in primary schools, the

study of the second language may be introduced in a suitable grade/ class at the primary stage." This suggestion may be held valid even now. On the other hand, in States/UTs or organisations where only the first language is studied at the primary stage, the study of the second language must be introduced in the first year of the upper primary stage. However, in this context, the recommendation made by the Kothari Commission still remains the best piece of counsel: "The stage at which Hindi or English should be introduced on a compulsory basis as a second language and the period for which it should be taught will depend on local motivation and need, and should be left to the discretion of each State." {(8.33(5)}.

During the first two years of the primary level, children have to be specially helped to acquire the basic skills of listening, speaking, reading, and writing and thinking. Special attention must be paid to the process of standardisation of pronunciation according to the norms. Similarly, the skill of good handwriting, correct spelling and right habit of silent reading with comprehension are also to be developed besides nurturing in the students the ability for creative self-expression.

At the upper primary stage, students' competence in both the languages has to be strengthened further to enable them to acquire real life skills to be used in their future day-to-day life. In their first language, they have to be introduced to various forms of literature. They ought to be able to react in speech and in writing to whatever they read and listen to. Balanced stress on both the applied side and the metaphorical aspect of the language will have to be laid. Creative expression and the ability to think on one's own must be encouraged and nurtured through language teaching with the oral form of language finding important place in language curriculum. Applied or practical grammar also has to be given at this stage so that it may develop the students' insight into the nature, structure and functions of the languages.

The study of the third language would also begin at the upper primary stage. However, the choice of a particular class/grade of its introduction may be left to the States/UTs or organisations themselves. The study of all the three languages, then, has to continue up to the end of the secondary stage, i.e., Class X.

At the secondary stage (Classes IX and X) in the first language full mastery over the applied form of language and good acquaintance with literary language would be aimed at. Learners have to achieve maturity in oral and written expression in response to what they read or listen to. Understanding and appreciating the depth and diversities of human mind through the literary texts in prose and poetry must be ensured among the students. Teaching of grammar is to be systematically strengthened to facilitate the understanding and use of the subtle usages of language. Desirable attitudes and values must be inculcated through carefully selected language materials. Thus, high order communication skill in the first language, with grammatical accuracy and appropriateness of style must be adequately underlined as the main objectives of first language learning at this stage .

In English, Hindi and other modern Indian languages studied as second language at this stage, the capacity to use the language in speech and writing whenever needed in life, and read it with reasonable speed for information and pleasure would be the most important objective. Grammar is not to be taught as a theoretical subject per se, but it would be taught as practical or functional grammar in context with the minimum of theory.

Thus, more and more aural and oral skills of language are to be emphasised at the primary stage, all the skills, i.e., listening, speaking, reading, and writing and thinking are to be aimed at in a balanced manner by the end of the upper primary stage, and slightly more attention is to be paid to the skills of reading and writing at the secondary stage. The most crucial and ultimate task of language education at all these levels remains to prepare the learners to use the languages effectively in either mode (spoken/written) whenever and wherever required in their day-to-day life situations of all sorts.

2.8.3 Samskrit

Samskrit has a special claim on the national system of education because it:

- Has consistently been need in India for thousands of years and is still inextricably linked with the life, rituals, ceremonies and festivals of vast Indian masses;

- contains great store of knowledge and wisdom that needs to be revived, reformulated and enriched with whatever is the best in modern disciplines of knowledge;
- has the universal appeal all over the country;
- has very close structural, lexical and semantic relationship with Hindi and most other regional languages of India which makes the learning of these languages easier and better; and
- has been internationally accepted as the most scientifically structured language and is being increasingly acknowledged as the best suited language for computer use.

Therefore, it is extremely important to provide for and encourage the study of Samskrit. It may be introduced as part of a composite course of Hindi and the regional languages as mother tongue at a suitable point of the primary or the upper primary stage. The course has to be so planned that the study of Samskrit may not be ignored. At the secondary stage Samskrit may be made available as an additional option and at the higher secondary stage, suitable elective courses in Samskrit may be made available to all the students who wish to study it. Open school courses for Samskrit may also be designed for learners at all levels.

A major shift in designing Samskrit courses and transacting curriculum in the subject is that the language is to be treated as a living phenomenon which is still relevant to the general life needs of the people of India, and which has caught international attention because of the global interest in subjects like yoga, vedic mathematics, astronomy and ayurveda.

2.8.4 Hindi

All the languages of India are equally important and all the citizens of this country must love and respect all of them. Hindi is different in the sense that the Indian Constitution has given it the place of the Official language of the Indian union. As originally envisaged, it is fast becoming the lingua franca of the country. As such, it is necessary that courses in Hindi are suitable for opening up channels of integral communication in all parts of India and ensuring the acquisition of a high level proficiency in it. In order to achieve these targets, more

and more functional courses in Hindi, besides those of literature, are to be made available in the regular school system as well as in the form of Open School courses.

2.8.5 Foreign Languages

In view of the fast increasing international interaction and cooperation in socio-political, educational, cultural and economic fields, a growing need for learning more and more foreign languages like Chinese, Japanese, Russian, French, German, Arabic, Persian and Spanish has recently been felt.

These languages cannot be accommodated within the Three Language Formula. However, depending on the demand for the study of any number of these and the infrastructural resources available with the schools, these languages may be offered as additional options at the secondary stage.

2.8.6 Mathematics

One of the basic aims of teaching mathematics in schools is to inculcate the skill of quantification of experiences around the learners. Toward this, carrying out experiments with numbers and forms of geometry, framing hypotheses and verifying these with further observations form inherent part of mathematics learning. It would also include generalising these findings with proof and developing competence to solve problems. Mathematics helps in the process of decision-making through its application to real life situations in familiar as well as non-familiar situations. It contributes in the development of precision, rational and analytical thinking, reasoning, positive attitudes and aesthetic sense. Apart from being a distinct area of learning, it helps enormously in the development of other disciplines which involve analysis, reasoning and quantification of ideas. Study of mathematics also provides ample opportunities for making conjectures, testing and building arguments about their validity and also in asking new questions. Understanding of the basic structure of mathematics leads to a much better appreciation of the scope and power of mathematics. The mathematics curricula must develop an appreciation and understanding of the contribution of Indian mathematicians along with that of others. This would develop a sense

of self-esteem and self-confidence amongst the learners.

While determining the curriculum in mathematics for the secondary stage it must be kept in mind that majority of learners would leave school at the end of the stage. They would need to apply mathematical skills and competencies in their work situations. A smaller number of students, of course, would go for higher education. The curriculum therefore needs to strike a balance between the learning requirements of both the groups.

In the first two years of the primary stage, i.e., in Classes I and II children need to form some basic pre-number concepts related to size, length, mass etc. They need to sharpen their skills of classification, grouping and sequential thinking. These provide them a sound foundation for learning numbers and developing competency of addition and subtraction. Content of mathematics will be built around the immediate environment of the child. In classes III to V, the child should be introduced to numbers and fraction as a concept. The four fundamental operations — addition, subtraction, multiplication, division, and computational skills related to them need to be mastered on numbers and fractions. The concepts of length, mass, capacity, money, time, area and volume be developed along with the units of measuring these. The child should gain familiarity with geometrical forms and figures and be able to appreciate patterns and symmetry in the environment. Simple applications of arithmetical processes should find an important place.

The upper primary stage should be confined mostly to the study of essentials of mathematics for day-to-day life. The students should acquire knowledge and understanding of facts, concepts, principles of mathematics needed for daily use, practical geometry, simple mensuration, descriptive preliminary aspects of statistics and fundamentals of algebra. The geometrical concepts should be introduced and verified experimentally using variety of models and instruments. The students may be encouraged to gain proficiency in oral/mental maths useful in day-to-day life activities as well as solving problems with accuracy and speed. Further the students should be able to read and interpret data from statistical graphs/charts/diagrams, and develop skills of drawing, model making and measuring.

The quality of teaching/learning process of mathematics at the elementary stage should enable students to attain the mastery level. Remediation and proper evaluation should constitute an integral component of teaching-learning of mathematics at this stage.

At the Secondary Stage, the teaching-learning of mathematics has to serve two complementary purposes. Firstly, the aim should be to further enhance the capacity of the students to employ mathematics in solving problems that they face in their day-to-day life. Secondly, a systematic study of mathematics as a discipline has to be started here and continued further. The curriculum may include the study of relevant arithmetical concepts, number system, algebra, geometry, trigonometry, coordinate geometry, mensuration, graphs , statistics etc. The idea of proofs should be developed with thrust on deductive reasoning. Emphasis is to be laid on wider applications of mathematics by way of making data based problems pertaining to actual data on population, agriculture, environment, industry, physical and biological sciences, engineering, defence, etc. Also the students should attain proficiency in presenting information available in their environment in the form of graphs and charts, and be able to do calculations with speed and accuracy. Further the students should acquire the ability to solve problems using algebraic methods and apply the knowledge of simple trigonometry to solve problems of heights and distances etc. The history of mathematics with special reference to India and the nature of mathematical thinking should find an important place. The students may be encouraged to enhance their computational skill by the use of *Vedic Mathematics*.

Mathematics learning should be imparted through activities from the very beginning of school education, i.e., from the primary stage itself. These activities may involve the use of concrete materials, models, patterns, charts, pictures, posters, games, puzzles and experiments. The importance of using learning aids needs to be stressed.

To help exploration of mathematical facts through experimentation, a mathematics corner could be set up in the existing science laboratories. For this existing science laboratories need to be converted into science-cum-mathematics laboratories. This may be done by involving students and teachers by mobilising community resources to this end. This should be treated as an exploratory centre

for science and mathematics. Indigenous experiences and innovations in mathematics, based on real life situations, be given an important place. In terms of scheme of evaluation of such mathematical learning, this has to be given weightage equal to that in science.

While developing the instructional material, the content and language of problems included in the textbooks should highlight core components like gender equality, protection of environment, removal of social barriers, observance of small family norm etc.

At the secondary level, evaluation should lay stress on testing the understanding and application of concepts rather than testing the rote memory of the concepts.

2.8.7 Science and Technology

Science is the creative response to the curiosity and capacity to wonder present amongst every human being. Learning of science in schools augments the spirit of enquiry, creativity and objectivity along with aesthetic sensibility. It aims to develop well-defined abilities of knowing, doing and being. It also nurtures the ability to explore and seek solution of the problems related to environment and daily life situations and to question the existing beliefs, prejudices and practices in society. Science concerns itself with the fundamental knowledge of universe, world and its environment. Technology deals with numerous ways and means of pressing science into the service of mankind, thus enhancing and improving the quality of human life. Learning of science in general education up to secondary stage, therefore, needs to be replaced by learning of science and technology in view of the strong organic linkages between the two. Scientific pursuits have primarily attempted to comprehend the physical world, the technological initiatives that have tended to manipulate and control the same. Science is universal and its principles and laws could be verified anywhere. The technology takes appropriate shapes depending upon various factors including economic, geographical, social and political conditions. The twenty-first century citizens will have to acquire the basics of scientific and technological literacy. The learners have to understand how basic scientific principles are applied in finding solutions to problems in the field of agriculture,

weather, energy, health and nutrition, industry, defence, information processing and other areas of human concern. It would help them discover the relationship between science and technology in these areas besides acquiring problem-solving and decision-making skills.

Science operates through its processes. Consequently, teaching and learning of science needs to be characterised by focused emphasis on processes, i.e., experimentation, taking observations, collection of data, classification, analysis, making hypothesis, drawing inferences, and arriving at conclusions for the objective truth. The process skills so acquired would help in developing attitudes and values that constitute the spirit of scientific temper. Science has to be learned more in familiar environment and not in alien and contrived situations.

An important purpose of science and technology teaching in general education up to secondary stage is to familiarise the learner with various dimensions of scientific and technological literacy. These would include — understanding the nature of science; ability to properly apply appropriate science concepts and their technological applications; capacity to understand values that underlie science and technology, willingness to understand and appreciate the joint enterprise of science, technology and society, ability to develop rich and satisfying views of the universe and to continue science and technology education throughout life, and development of certain manipulative skills which are required in day-to-day life situations. In addition to the support available to develop these skills within and outside the laboratories it would be imperative to make use of tools of information technology such as computers and multimedia packages.

Science and technology education should have something of value to offer to all students. Particularly, rural and tribal oriented technology will have to be made an important part of the educational package and its connectivity will have to be ensured. Science must cut across traditional subject boundaries and open itself to issues such as gender, culture, language, poverty, impairment, future occupation and environment and observance of small family norm. It is also necessary to familiarise children with Indian traditions of scientific and technological learning and contributions of Indian scientists

both in the past and the present. The achievement of India in various fields through scientific and technological enterprises would develop and nurture self-confidence and self-assurance amongst the learners. All these issues should become integral aspects of science curriculum.

Primary Stage

Science forms an integral part of learning at the primary stage. Essentially it has to be learnt mainly through concrete situations related to immediate environment during the first two years. The focus would be on sharpening senses of the learners and encouraging them to discover, observe and explore their environment and surroundings. This will lead to enrichment of the experiences, mostly on their own and supplemented occasionally by the teacher. The experiences and activities can be gradually structured during the remaining three years of primary education where environmental studies is to introduced. The focus would, however, remain on objects, events, natural phenomena and learner's environment. Children would continue to learn to observe, explore and identify occurrences in their environment. This would also lead to stimulation of curiosity which would further lead to formulation of several questions in the mind of the learners. Teacher could utilise this as a major input in the learning process by further encouraging children to collect information and wherever possible attempt to classify. The process of searching for answers independently and in groups can begin at this stage. Skills of estimation and measurement can also be developed.

Upper Primary Stage

Children at this stage begin to recognise, the relationship of science, technology and human enterprise. The process has to be strengthened and concretised. The learner is better equipped to understand the processes that underlie simple scientific activities and to visualise their use in solving problems and taking decisions. They also begin to appreciate the cause-effect and structure-function relationship. The environment should continue to be a major source of the learning and the students should try to understand the changes taking place all around. They would also gain an understanding of

living world, balance of nature and the role of air, water and energy. Due emphasis should be given to conservation of natural resources. Elementary understanding of some basic principles of science relating to matter, materials and energy can be introduced at this stage. Familiarity with life processes, health, nutrition and diseases, soils and agricultural practices and adaptation would also be included.

Instead of loading the students with scientific informations, efforts should be made to help them to learn *key concepts* which cut across all the disciplines of science. This would generate curiosity and would enhance awareness and understanding. The learner can be encouraged to improvise simple equipment and design experiments using local resources to understand scientific concepts and seek explanation of some of the natural phenomena. They can also be made aware of some of the local and global concerns and need to be constantly aware of these particularly in areas like drinking water, environment, health, nutrition and family welfare and others.

Secondary Stage

This is the stage after which majority of the learners will enter the world of work. Scientific attitudes and skills developed at this stage would become foundation for further growth. They need to be exposed to the nature and the structure of science and the support it provides to the technological developments. At this stage, learning of science would continue to be built around natural and social elements of environment. Focus would continue to be on understanding of concepts and applications in the areas of matter and its properties, energy, relationship of various physical processes and the technological applications of principles of science. The biological sciences will deal with living organism, their organisation and life processes. An integrated approach to science and technology leading to their application in areas like health and nutrition, industry, agriculture and animal husbandry and allied areas would establish linkages of science to societal aspirations. Science, technology, society and environment would coalesce in teaching and learning of science at this stage.

Practical activities to be chosen should have relevance for future life through acquisition of skills and values. The learners need to be

encouraged to work both individually as well as in the groups. Critical, creative and generative thinking has to be developed. Improvisation should be encouraged but designing would also be provided for as a component in exploration. Flexibility in experimentation needs to be widely promoted. Teachers could help the learners devise appropriate experimentation and activities within the school and also outside school involving immediate environment such as farming, factories, industries and community.

2.8.8 Social Sciences

The component of social sciences is integral to the total quantum of general education upto secondary stage. It helps the learners in understanding the human environment in its totality and developing a broader perspective and an empirical, reasonable, and humane outlook. It also helps them grow into well-informed and responsible citizens with necessary attributes/skills so that they could participate and contribute effectively in the process of development and nation-building.

The social sciences curriculum in schools will draw its content mainly from geography, history, civics and economics. It may also include some elements of sociology. Together they provide different dimension of studying the human society — over space and time and in relation to each other. It helps the learners in understanding the contemporary society better. Social sciences education aims at providing students essential knowledge, skills and attitude necessary for self-development and also for becoming an effective and contributing member of the society.

In order to make the social sciences education meaningful, relevant and effective, the concerns and issues of the contemporary world need to be kept in the forefront. To this end, the quantum of history may have to be substantially reduced. Past developments could be studied as a backdrop for understanding the present. As such, the needs and challenges of today must be responded suitably. Globalisation and liberalisation on the one hand and localisation on the other, are going to have tremendous impact on the future society. These have also brought in their wake many economic and social challenges and opportunities which need to be addressed effectively

for building a strong cohesive Indian Society. It also calls for developing emotionally intelligent learners, who are prepared to face new challenges and adjust to unfamiliar situations. In a democractic set-up with decentralisation of power, local governance such as 'Panchayati Raj' has gained importance. It aims at raising the levels of participation and involvement of people. In order to make optimum utilisation of resources for development, the local governance has to be more responsive and efficient. The learners, therefore, are to be equipped well to understand the process of development, its need and implications as well as the system of governance — at all levels — local, state and national, and their own place in it. This would necessitate considerable increase in the coverage of courses in civics. Academic as well as social skills such as critical thinking, reading and interpreting tables, diagrams and maps, cooperating with others, responding to other's problems and providing leadership need to be developed in a systematic manner. A well-designed social sciences curriculum would help learners 'think globally and act locally'.

In a world of ever-increasing knowledge, selection and organisation of the content areas assume great importance. The social sciences curriculum has to be comprehensive and yet not heavily loaded with information. Interrelatedness of ideas and their comprehensibility must be kept in view. It would also be desirable to emphasise the process of learning and thinking rather than mere acquisition of facts. Learners need to be given meaningful learning experiences through well-planned activities. This will help them acquire basic competencies and skills. Keeping these in view, the themes/issues could provide a sound basis for the selection and organisation of the content areas. While number of topics/areas may be few, the depth of treatment should be more to optimise the learners' experiences. These themes may be drawn from geography, history, civics, economics and sociology in a balanced manner and suitably graded — simple to complex and immediate to remote. Some of these issues and themes may be as follows:

Study of Indian civilisation and its rich cultural heritage along with other world civilisations and their interconnections may be the major area of study drawn from history. It ought to include the different

cultural movements and revolutions in the life of the country and also the spread of its culture in other lands. Food security, population growth, poverty, water scarcity, climatic changes and cultural preservation are some of the major issues of the twenty-first century, which have relevance for the social sciences curriculum. As such 'Environment, resources and sustainable development' and 'man-environment interaction' would be drawing their content mainly from geography, economics, sociology and other related areas. Social, economic and political institutions and their functioning and administrative system especially with reference to India would draw content from civics and economics. Emphasis has to be laid more on the economic, political and social aspects of human environment especially the contemporary world that too with focus on India. The Europe-centred view of the world must change. This would render topics like the discovery of India or America by Europeans irrelevant for Indian students.

Social sciences are the most suited areas of study for integrating almost all the core components indicated earlier. For example, the history of India's freedom movement, the constitutional obligation, content essential to nurture national identity, equality of sexes, removal of social barriers, fundamental duties and human rights including right of the child may be integrated appropriately. Suitable content and approach to ensure infusion of these vital areas may have to be followed at different stages. Similarly, many values may be inculcated through the teaching of social science.

Teaching of social sciences ought to promote a humane and national perspective, and inculcate a sense of pride in the country and in being an Indian. It needs to strengthen the national identity and develop an appreciation for cultural heritage. It should promote communal harmony and social cohesion. Its teaching must be objective and free from all kinds of stereotyped images, biases and prejudices.

Fieldwork, project work and group activities should form the basis of teaching-learning in social sciences. Projects having direct link with the local community may be encouraged. Economic and politico-legal literacy, grievance redressal system and consumer education should be promoted.

Primary Stage

In Classes I and II, children are introduced to the environment in its totality. No clear cut distinction between natural and social environment has to be made. Its content will be drawn from the immediate environment of the child. There will not be any separate area of study for it. Its content has to be integrated with language, mathematics and other activities such as games, health activities and drawing. The skills of observation, description and self-expression could be promoted.

In Classes III to V, the natural and social elements of environment may be introduced under a separate area of study called *Environmental Studies*. Starting from the surroundings of the children — home, school and neighbourhood, they may be familiarised with their state and country in a gradual manner. Stories and narratives concerning their everyday life — food, clothes, houses, fairs and festivals, and the changes taking place in their surroundings will make the curriculum relevant and enjoyable for the young learners. At this stage, an attempt may be made to develop a sense of pride in and respect for the traditional dress patterns, costumes, folk music, folk dance, fairs and festivals celebrated in the local community and area. This may be done with a view to developing an understanding of various factors that contribute to social cohesion. Children may also be familiarised with the ways people lived in the past and how they live in different parts of the country now. Some well-known personalities of the community and the country, who acted as major influences in shaping lives of people, may also be included in the curriculum.

Schools will be given full autonomy at this stage to use locally developed curriculum and locally available resources for teaching of environmental studies.

Upper Primary Stage

After having some idea of the country in the early years, the learners may be gradually initiated into the study of India and the world in some greater detail. The components of environment and their interaction will be studied in terms of processes and patterns. The learners may be encouraged to investigate and undertake studies

on their own. For example, students may be motivated to raise questions pertaining to various physical and man-made features, phenomena and events. They may be able to recognise simple patterns such as rainfall distribution in the country and patterns of agricultural and urban land uses. Study of India's past may be introduced through selected events/episodes and developments — social cultural and scientific. The learners need to be helped to understand and appreciate India's cultural heritage, some of the other ancient civilisations of the world and their interconnections, contribution of India to the world civilisation along with contributions made by other cultures, and some major historical developments of the world. The contemporary society including the social, political and economic institutions of India and their functioning, the administrative system, urbanisation and economic and social development may be some other areas to be included. In addition to academic skills, social skills and civic competencies may be developed to help them grow and participate effectively in day-to-day life

Secondary Stage

Contemporary India may be the focal theme. It may include the processes and patterns of man-environment interaction and the issues related to environment, its resources, and development. Major developments in the recent past including India's struggle for freedom and the contributions of various sections/regions/groups especially the role of women and weaker sections in the movement having bearing on the social, economic and political developments and challenges in the post-independent India will also be covered. Issues and challenges of India such as poverty, illiteracy, corruption and anti-social practices, fundamental rights, fundamental duties and economic development will be covered appropriately. In addition, India's role in the world especially world peace, international cooperation and decolonisation may be included. Contributions and achievements of Indians in other countries may be given due place. At the end of the secondary stage, the students may develop the ability to use their knowledge, understanding and skills by undertaking wide range of studies at various scales-local, regional, national. By now they may develop the ability to describe interaction within natural

and human processes and recognise patterns. They may also be able to look for sources of information and analyse problems/issues rationally and scientifically. It would be useful if students take up a few case studies/project work as it would help them investigate and consider the issues that arise from people's interaction with their environment.

2.8.9 Art of Healthy and Productive Living — Primary Stage

The need for introducing an interdisciplinary area of learning integrating the major concerns of Health and Physical Education, Art Education and Work Education has assumed greater significance. Despite clear allocation for time for these components in the earlier curriculum documents, little attention in reality has been paid to these. There have been logistic, conceptual and other difficulties experienced by the teachers and implementing agencies which contribute enormously towards the all-round development of the personality of children. The system seems to have experienced difficulties to be responsive to the developmental needs of children. Another major factor leading to the half-hearted implementation of these areas could be lack of availability of proper motivation and evaluation procedures among teachers. Yet another bottleneck seems to be their presentation in a fragmented manner. As such, the proposed subject under the title *Art of Healthy and Productive Living* is being recommended initially for primary classes which can be subsequently extended to upper primary classes.

The main objective of art of healthy and productive living is to develop aesthetic sensibilities and skills of healthful living besides providing a nurturing ground for love for labour, positive social attitudes and moral values so as to enable the child to be receptive to ideas of others with humility and sincerity in thought, word and deed. This will provide children with opportunities for their development into social human beings and dedicated and contributing citizens for the society and the nation. Love for mankind and helping the needy would germinate at this stage and its culmination would be in terms of attainment of selfless service–*Seva*.

Classes I and II

Experiences such as scribbling, enjoying movements of the parts of body, deriving pleasure through seeing colour, figures and toys gained earlier would be strengthened. Children's natural urge to play ought to be satisfied. The activities could be organised which help children make subjective choices about music and also drawing and painting in some shapes, developing clay models during play, and participating in group activities involving light exercises, group songs, theatrical arts and dances and imitative actions.

Teachers will have to develop activities keeping in mind local environment, cultural background of children and available resources. Teachers have to provide opportunities for free play and free expression to children with a focus on the objectives of each purposeful activity organised for them. It should be ensured that each child participates and learns certain good habits in practical sense. This stage is apt for value inculcation through story telling and dramatisation suiting to the level of maturity and understanding of learners. All such activities need to be presented in an integrated manner.

At this stage children may also develop a habit of keen observation and accurate description of things around them. They may pick up the skills of both, cleaning the teeth and dressing up. Now the children have also to learn behaviour and speech in formal settings. They are to be taught how to sit and stand properly and how to talk in a formal manner.

Classes III - V

At this stage, children develop better muscular coordination and acquire sensory discrimination. They develop a feeling of self and acquire the capability of knowing about themselves and the immediate environment surrounding them. The play at this stage may include light physical exercise and drill which can be combined with music. This is the stage when children can be taught to develop elementary knowledge relating to health, strength and beauty of the body. They may also develop the art of relaxation. Children should be initiated into the art of using and controlling senses related to hunger and thirst and regulating calls of nature. Their speech, behaviour,

movement and action can be properly controlled. They may appreciate beauty in the objects around them and undertake exercises, and develop sense of preference for things and music. At this stage, attitude formation with regard to proper and healthy living in terms of cleanliness of body, surroundings, dress and place of sitting and eating, may be encouraged. Children at will also start liking activities pertaining to games and sports and would be introduced to the basic physical postures leading to yogic exercises. Mimicry and using various musical instruments will become part of their experience. Feeling of affection, friendship and social cohesion will be nurtured. Activities pertaining to drawing and painting, collage, clay modeling, printing, using masks, puppets and toys, folk dance, *rangoli*, *alpana* and the like may constitute the syllabi at this stage.

It will be desirable to orient teachers in undertaking activities pertaining to the art of healthy and productive living in an integrated manner. Suitable instructional materials both in print and non-print form including wall posters addressed to the teachers may prove to be of great help in initiating children to the art of healthy and productive living.

2.9 Work Education, Art Education,Health and Physical Education – Upper Primary and Secondary Stages

Work Education

Work Education is viewed as purposive and meaningful manual work, organised as integral part of the learning process and resulting into goods or services useful to the community besides the pleasure of self-fulfillment. It should be an essential component at all stages of education and be provided, through well-structured and graded programmes. The competencies to be developed in this field should include knowledge, understanding, practical skills and values through need based life activities. Major categories of work which need to be specifically stressed include: (a) work pertaining to needs of the individual such as health, hygiene, clothing, cleanliness, etc; (b) work in home to be performed as a growing member of the family; (c) work in the classroom, school and in the out of school activities

integrated with school life as well as learning of other subjects such as physical education, art education, social studies, science and others specifically designed to foster certain learning objectives of work education; (d) work in the community focused on self-less service or *seva*; and (e) work relating to vocational development, production, social usefulness and exploration of the world of work.

The activities pertaining to work education should be so organised as to realise the objectives of work education such as inculcation among learners of respect for manual work, values for self-reliance, cooperativeness, perseverance, helpfulness, tolerance and work ethics besides developing attitudes and values-related to productive work and concern for the community. The theory and practice have to be such that it enables learners to understand the facts, terms concepts and scientific principles involved in various forms of work situations, know the sources of raw-materials, understand the use of tools and equipments in production and service processes, acquire skills needed for technologically advancing society and conceptualise their role in productive situations. The programme should develop among learners the skills for identifying, selecting, arranging and developing innovative methods and observing, manipulating and participating in work practices and thereby enhancing productive efficiency.

At the upper primary stage, the learners are sufficiently mature to carry out strenuous work involving higher skills and requiring closer neuro-muscular-coordination. The learners would have got proper orientation toward work and respect for manual work through the activities undertaken at primary stage under the art of healthy and productive living. These can be further strengthened by encouraging them to participate more intensively in production processes by understanding and executing well-designed projects. The methodology has to be based on observation, manipulation and work practice. At this stage, the learning and mastery of skills becomes more important than at the primary stage. With a view to integrating science and technology with the life of community, emphasis should be laid on agricultural and technological processes which may enable the learners to feel confident for their entry into the work force. The activities have to lead to enhancement in nutrition, personal and

community health, sanitation, productivity and economic status of the community. Thus, activities may have three dimensions, observation of work situation and identification of task, participation in work situation, and preparing articles in large numbers. All activities need to be simple and enjoyable.

At the secondary stage, the complexity of the activities needs to be increased keeping the nature of essential activities, by and large, the same. Pre-vocational courses will get a prominent place at this stage which will facilitate choice of the vocational courses at the higher secondary stage and help them acquire the knowledge and skills required for entry into the world of work.

While many teachers may function as work education teachers, a large number of activities may require specialist personnel. Teachers undertaking work education need to be properly oriented and trained in the specific area of work. It would be desirable to utilise community resources for effective implementation of the programme both in terms of man and material. Services of experts available in the community need to be utilised by seeking their involvement in the programme.

Art Education

Art education constitutes an important area of curricular activity for development of the personality of the learners. The aim of art education may be perceived as development of aesthetic sensibility among learners so as to enable them to respond to the beauty in line, colour, form, movement and sound. The study of arts and understanding of cultural heritage may go side by side and reinforce appreciation and understanding for one another. The experiences gained by learners at primary stage in the area of fine arts under the *Art of Healthy and Productive Living* would have developed enough motivation and interest among learners toward the subject. The curriculum at upper primary and secondary stages need to aim at developing awareness and interest in a wide variety of arts both at the classical and folk level so that the learner is both the performer and the recipient of pleasure. Art education can provide the most satisfying medium of creative expression which has to be given due importance in the best interest of the society.

Even among fine arts, music has a special claim in the overall scheme of education at all levels. It begins charming a child through lullabies in the cradle and permeates the entire life subsequently. Music teaches children not only the rhythm of life but also finer emotions, values and standard and pleasant pronunciation.

At upper primary stage, art education programme should comprise, handling of the materials for drawing, painting, collage, clay modeling and construction of puppets; creating artistic things by free expression method and specific topics method; handling and playing of simple musical instruments and sound-producing bodies; movement, mime and simple dance forms; community singing; simple concepts of visual and performing arts; theatrical arts; stories of great personalities in the field of arts; and stories connected with other countries. Theater arts and dramatisation may be suitably introduced. Emphasis should be laid on the use of learner's own imagination and development of his/her own concepts and expression through exploration. He/she should be enabled to develop a sense of organisation and design, i.e., aesthetic arrangements permeating all life, and to feel a deep and lasting joy of art.

The secondary stage is apt for refining aesthetic sensibilities and social values through projects on conservation of natural and cultural heritage by providing opportunities for study of Indian culture working with artists/artistes in the community, organising festivals and celebrations of the community at large, display of physical environment and surrounding landscape and the like. Art education at this stage should comprise, study of visual and aural resources and their exploration; projects leading to creative expression and exhibition of the works in visual and aural forms; inter-group inter-school art activities; study trips and interaction with artists in the community; and exploration of traditional art forms including theatrical arts available in the community and neighbourhood.

Art education programme should concentrate on exposing the learner to folk arts, local specific arts and other cultural components leading to an awareness and appreciation of national heritage. Activities and programmes and themes should also be chosen and designed so as to promote values related to other core components like India's common cultural heritage, history of freedom movement and

protection of environment. Learning by doing and a wide exposure to art forms is a must for self-expression and widening of the learner's own experience. Art education should not be fragmented. It should adopt an integrative approach at all stages up to Class X.

Health and Physical Education

Health and physical education has to be concerned with total health of the learner and the community. It will include mental and emotional health besides physical health of the learners. The main aim of health and physical education programme should be to develop desirable understanding, attitude and practices with regard to nutrition, health and sanitation so as to improve health status of the self, family and the community. Learners need to be helped to develop an awareness about the health and sanitation at the community level and their role in that context. Physical education has to concentrate on developing health, strength and fitness of the body.

Games and sports have to find a prominent place in the total scheme of things. Emphasis should be on acquisition of adequate neuro-muscular coordination commensurate with their developmental stage. Yoga and meditation can be very well-organised under the regular school schedule to help children acquire concentration and relaxation. Other important activities concerning the area of health and physical education include Scouting and Guiding, NCC, and Red-Cross which can help in cultivation of such basic qualities as endurance, courage, decision-making, resourcefulness, respect for others, truthfulness, faithfulness, loyalty to duty, and concern for the common good. Students' involvement in these activities would constructively channelise their energies and also promote and integrate learning in different curricular areas directly or indirectly. This would promote the latent curriculum of an institution.

With a view to promoting healthful living and solving major health problems of the country, the general education of first ten years must help develop a system which promotes an integral development of body, mind and spirit. Medical inspection and check-up should be compulsory at all the stages with adequate follow up in cases in which deficiencies are noticed. Health and physical education including games and sports should be considered an integral part of

the learning process and be included in the evaluation of performance.

At upper primary stage keeping in view the characteristic physical growth, neuro-muscular coordination and social development, the learners may be exposed to vigorous developmental and rhythmic exercises, gymnastics, athletics, aquatics, judo, yoga, drill and marching, scouting and guiding camping and various team games and competitions. These options may be made available subject to the facilities available and the learners preferences. In health education, provision should be made for creation among learners an awareness related to common health problems, safety measures, nutritional problems, adulteration, first-aid, sanitation and pollution. Exercises of breath and yoga should receive special attention.

With regard to physical, mental and emotional health of learners, the secondary stage of education is particularly crucial. Rapid acceleration of growth and changes in appearance and functions of the body associated with the onset of puberty indicate the need of provision of appropriate guidance and counselling that would facilitate the adjustment and growth of children. Interests during this period narrow down to fewer games. The learner is likely to be more adventurous comparatively. Physical education should include more vigorous activities of various sorts including athletics, major games including indigenous games, gymnastics, yogic exercises, meditation, combatives, judo and swimming. The NCC, scouting and guiding and social service should be encouraged in addition to the compulsory programmes of physical education. In Classes IX and X, health education should enable the students to learn, in comparatively great detail, about personal health, impact of environmental pollution on health, food and nutrition, control and prevention of diseases, first aid, home nursing, and safety measures.

The knowledge of and activities related to personal and community health assume great importance. An awareness of HIV and AIDS may be given. Students may also be acquainted with evils associated with promiscuity and child and drug abuse. Adolescence education and sex-education may also be provided in a suitable manner. It would be desirable to generate suitable self-instructional material in this regard for different age groups of learners addressing to their

needs and requirements and matching to their level of growth and maturity. It should be provided to all learners. Provision for separate teacher and classes may need not be encouraged. The whole approach should be such that each learner participates and learns ways of healthful living.

2.10 Instructional Strategy

For effective transaction of the curriculum and achievement of curricular objectives, appropriate strategies should be used in organising activities for students and in providing learning activities. Instructional strategies may assume a variety of modes and may involve activities such as observation, collection of materials and information, demonstration and experimentation, project assignment, fieldwork and educational excursion and visits to museums, fairs and industrial units and places of historical importance. Playing games, participating in community singing, role playing, dramatisation, discussion, debate, problem solving, discovery learning, creative writing, and supplementary reading may also form an important part of the total instructional strategies.

A number of factors need to be considered while making use of a particular strategy: learners' capabilities, availability of resources, entry behaviour, school environment, objectives to be achieved, the nature of content and the teachers' own preparation and mastery.

The immediate environment of the learner, both natural and human, should be used for making learning concrete and meaningful. Effective learning takes place when teachers are able to involve the students in the process of learning, by taking them beyond the process of listening to that of thinking, reasoning and doing. In order to promote self-study skills use of library and resource centres needs to be encouraged.

Receiving regular feedback for teaching and learning should be an in-built component of teaching-learning strategy. Continuous and comprehensive evaluation plays an important role in providing regular feedback. It should be used for remediation.

Different kinds of strategies are needed for slow, average and fast learners. Diagnostic and remedial instruction should be used for the slow learner. Enrichment materials and goal-directed teaching-

learning strategies would help fast learners. Co-scholastic areas of learning should be handled adopting appropriate strategies and they be given due importance for developing the child's personality. Several school activities such as morning assembly, cultural and recreational activities, school beautification, activities in community living, celebrations of days of national importance, special days and weeks, and creative activities, may be organised/conducted with proper planning and well-directed goals.

2.11 Medium of Instruction

The mother tongue is the most vital factor for the children's intellectual, emotional and spiritual growth. The mother tongue is the 'mother tongue' not because it is the monther's tongue but because, like the mother, it is central factor behind the nurturance of the children's mental and emotional make up. Their perceptions, comprehension, responses, creative expressions thinking and analysis — all are maximally developed, therefore, through the medium of the mother tongue. The medium of instruction ideally, therefore, ought to be the mother tongue at all the stages of school education.

In the case of learners whose mother tongue is also the regional language or state language, it must continue as the medium of instruction ideally at all the levels of schooling or at least up to the end of the elementary stage. However, in the case of those students whose mother tongue is different from the state language or regional language, the regional language may be adopted as a medium only from the third standard onward. In the earlier years the students' mother tongue ought to be used in such a manner that a smooth transition from the students' operations in the mother tongue to those in the regional language naturally takes place at the earliest.

2.12 Instructional Time

All possible efforts should be made to ensure that the stipulated number of working days are actually available to schools for instructional activities. Loss of instructional time due to unspecified reasons should be prevented or minimised through better educational management. After taking into account the number of days required for organising evaluation activities/tests/examinations, school

functions, etc. a minimum of 180 days in a year should be available for effective instruction.

An early childhood centre/pre-school centre should function for three hours a day. A primary school should function for five hours a day out of which four hours may be set aside for instruction. For the upper primary and secondary schools, the duration of a school day should be six hours out of which five hours should be kept for instruction and the rest for the other routine activities. The duration of a class period may be around 40 minutes.

It should be impressed upon schools that every subject and activity should be given the number of hours/periods and adequate time. Time once allocated for one subject area/activity should not be encroached upon as per the individual or institutional perception of the relative 'importance' of different subjects.

2.13 Open Learning System

The Open Learning System, at the school and the university levels, is now established fully both at the centre (National Open School) and in states (States Open Schools). The mission statement of the open learning system is to take education to the doorsteps of the learner, enhance social equality and create flexibility for lifelong learning. This system at the school level utilises to a great extent information and communication technologies through the use of computers and radio and television broadcasts. Along with the use of satellite-based communication technologies, it provides many structural flexibilities which seem to have an edge over the conventional formal system. These flexibilities relate to the place of learning, time of learning, eligibility criteria, students' choice in selecting combinations of subjects, and the scheme of examination. Alternative Schooling through open learning system seems to be a viable strategy for reaching the unreached and may contribute toward universalisation of elementary education. Open schooling, through its bridge courses and foundation courses, and undifferentiated curriculum, can contribute in a big way to achieve the goals of general education especially in equipping the learners with necessary life skills for becoming self-confident individuals and contributing citizens of the nation.

3

Organisation of Curriculum at Higher Secondary Stage

3.1 Context

After ten years of general education, the higher secondary stage assumes great significance as students for the first time move toward diversification. By now the students start developing their own thinking and independence of mind. As such, they are better placed to exercise a choice of course keeping in view their needs, interests, capabilities and aptitude, which would enable them to cope with the challenges of future. They may, therefore, choose either specialised academic courses or job oriented vocational courses. For majority of students, the higher secondary stage may be the end of their formal education leading to the world of work. For others, it would be a bridge to the tertiary stage of education — academic or professional courses.

3.1.1 Higher Secondary: The Stage of Maximum Challenge

The higher secondary stage is crucial in many ways. It is the stage of maximum challenge. While the students in this age-group are passing through a critical phase of their lives – transition from adolescence to youth, they have to take important decisions concerning their future career by choosing suitable courses. In fact, more than the need and aptitude, it is the awareness and performance of the students at this stage that ultimately determines their future. Whether they would be able to get into a job or a vocation or pursue further studies of their own choice/preference, is the uppermost concern in the minds of students and their parents. It causes anxiety and stress, which may be avoided by careful planning and strategies adopted for designing suitable courses suited to their future requirements.

Normally, only a small percentage of student population reaches the tertiary level. It is from amongst these that the eventual leadership emerges. The quality of these people depends on the foundation laid in early years especially at the higher secondary stage, the products of which provide the second or intermediate level of leadership in every walk of life. They are expected to make meaningful contributions to developmental efforts in agriculture, industry, business and various other social services. Opportunities for wage employment as such are very limited. Hence, the students at the higher secondary stage must be fully equipped with basic knowledge, skills, attitude and entrepreneurship so that they can qualify for self employment as well.

3.1.2 Learners' Profile : A Stage of Transition from Adolescence to Youth

The higher secondary stage deals with human beings at a sensitive stage of transition from adolescence to youth. This stage is characterised by the process of maturity, both of body and mind. It is at this stage that abstract thinking and logic develop predominantly. Goal fixation and symbolisation are the other characteristics that mark this stage in a big way. Similarly, traits like self-consciousness, self-assertion resulting in an emergence of identity of the self-indicating personal preferences and choices, and ideal formation are typical of this stage. The students also show strong likes and dislikes, reactions and adventurism and have strong peer group influences. There is a tendency to imitate adult behaviour and roles, defiance, moral reasoning and challenging attitude towards the established ideas, practices and authority. This is also marked by an increased sex-consciousness and sexual interests.

At this stage, learners' interests and aptitudes begin to crystallise and stabilise which have a potential to shape the future occupational status of the learners. A feeling of anxiety about the future also begins to haunt them. At this stage, guidance and counselling should go a long way in sorting out such problems as in no way are unnatural.

An important feature of this stage is that it is a transition from the general and undifferentiated curriculum to courses of specialised

nature. Therefore, curriculum at this stage has a hangover of general education and the challenge of specialisation, characteristic of the tertiary education. Change is the watchword at this stage of life. In order to equip the youth to cope with change in life it is essential that the cultural and ethical values are appropriately stressed and carefully cultivated. A sense of belongingness to the society and the country at large ought to be nurtured to avoid feelings of rootlessness and alienation from the society.

3.1.3 Access, Equity and Excellence

There is a perceptible change in the socio-educational climate of the country. Emergence of a growing affluent middle class eager to spend money for good education for their wards, has changed the total teaching-learning scenario. No doubt, private initiatives in school education can and do contribute substantially whenever introduced with a sense of service, sincerity and commitment. However, the mushrooming number of private coaching centres these days has shaken the very foundation and philosophy of school education. It is a challenge for those who cannot afford expensive private coaching. Such imbalances need to be corrected by introducing a very strong social purpose in the field of education. It is high time the foundation of school education was strengthened by providing all the necessary quantum of learning experiences needed for *diversity and flexibility* in school system and by developing an appropriate linkage between the higher secondary and tertiary levels.

While accepting the goals of diversification and flexibility as indispensable at the higher secondary stage, one cannot afford to ignore the basic parameters of equity and excellence. Special care needs to be taken of the institutions located in rural, tribal and remote areas and the students therein, by providing them special inputs. The price is none too big for a society that believes in promoting egalitarian values and reducing the existing disparities. The Indian Constitution also provides for positive discrimination to see that the neglected and the weaker sections are brought into the mainstream of the national life, enabling them to make their effective contributions to the harmonious development of the Indian society.

There is a need to identify the various ingredients and variables that ultimately determine the quality of education and its end product. In today's world of globalisation marked by competitiveness and challenges, it is required more than ever before that the country sets its own national standards comparable to any international standards. Well thought out courses of studies, detailed curricular outlines, identification of learning outcomes, variety of instructional materials — audio and visual — and multimedia packages and improved evaluation tools will have to be developed. Special teachers will have to be provided for promotion of physical education, games and sports, arts and aesthetics and vocational courses. And yet all this may not be enough. It is the process of curriculum transaction, both in and outside the class, that will have to be carefully looked into. The teacher will have to play a catalytic role, entirely different from what he or she is used to, at the moment. A teacher will have to plan meaningfully and imaginatively learning opportunities in which students are encouraged to learn individually, in small groups, from one another and from the society and environment at large. It is the acquisition of learning skills, the ability to explore, observe and discover the unknown and facility in analysis, synthesis, critical thinking and decision-making that need to be the watchwords of curriculum transaction under the supervision of the teacher who should essentially be a facilitator of learning.

3.1.4 Diversification and Flexibility

To suit the varied needs and potentialities of an adolescent, diversification and flexibility should be the major characteristics of the higher secondary curriculum. Since interests and aptitudes of the students largely stabilise by the time they reach this stage, they should be provided opportunities to pursue courses of their choice keeping in view their inclination and preferences. In the context of the rigidities that characterise the education system, for instance, non-availability of choices which cater to individual differences and interests and lack of opportunity to move at one's own pace, it is suggested that the content of courses may be made flexible to the extent possible. Courses with credit system and of varying durations may be provided to the students of both the academic and vocational

streams. However, the value of a foundation course cannot be underestimated. Core components and value education should also be integrated with different areas of study appropriately.

Courses at the higher secondary stage will fall into two broad streams, academic and vocational. In each of these, there would be a judicious mix of foundation courses and specialised elective courses. The existing groupings like arts, science, commerce, and agriculture should not be treated as sacrosanct compartments. Students should have freedom, within practical limits, to choose courses simultaneously from more than one group according to their needs, interests and aptitude. Over a period of time, the mental inhibitions setting barriers between the academic and vocational streams and between the various traditional groupings can be dismantled.

3.2 Semesterisation

Introduction of the semester system was advocated by the NPE, 1986 with a view to ensuring greater flexibility and functionality among the courses to be offered at the secondary and higher secondary stages. The greatest argument in support of the semester system is the freedom it offers in experimenting with the satisfactory tools and techniques of evaluation in general and the learning outcomes in particular. It supports the universal belief that evaluation should be both comprehensive and continuous and that it should be more formative and corrective in nature than summative and judgemental. The document entitled *Higher Secondary Education and Its Vocationalisation* (NCERT, 1991-92) dealt with the question of semesterisation particularly in the context of vocationalisation of higher secondary education, which also recommended the semester system for facilitating flexibility in learning and evaluation. During the last fifteen years, semesterisation could be introduced only in a small number of institutions in the country. In most of the cases, a year's course has been arbitrarily divided into two parts to be covered in the two halves of an academic session.

Semester-based education aims at formulating convenient units of learning and making a quantum jump in educational standards. It

can initiate and sustain a process of modernisation and improvement in teaching and learning, and provide flexibility in the choice of courses to suit the individual needs and interests. It can also lead to reforms in the technique of evaluation, the promotion of interdisciplinary approach and studies and internal evaluation by the teacher teaching the courses.

The system of earning and accumulating credits, which is the basis of semesterisation, is followed by only a few advanced institutions of higher learning. The general non-implementation of this reform in curriculum and evaluation, so far, is due to academic, financial and administrative reasons and also due to the physical dimensions of the frequency of examinations conducted by the examining agencies. It is high time now that necessary preparation was undertaken and a modest beginning in vocational and academic streams was made to ensure greater flexibility and diversification in the school system. In the present scenario when the requirement of different sectors including industries is to prefer functionaries with multi-skills, semesterisation based on credits offers a viable solution.

In the semester system, students have the choice to take any number of credit hours as per their requirements and capacity, and at their own pace.

3.2.1 Credits

The semester pattern of education is modelled on credit system. Each course in a semester carries a number of credits depending upon the quantum of work required to be done and the time to be spent on it. Credits usually connote the number of contact hours in a class per week throughout the semester in the form of lectures, tutorials and seminars. One credit course normally implies class instructions of fifty to sixty minutes each supplemented by two to three hours of study at home per week during a semester. In laboratory work and in a field study, one-credit course implies two to three hours of work per week throughout the semester.

In the semester system, students earn credits in a course after they have (i) attended the minimum number of prescribed lectures including tutorials and seminars delivered or practicals including

laboratory and/or fieldwork conducted; (ii) have obtained not less than the minimum percentage of marks or qualifying grades allocated for internal assessment; and (iii) have obtained not less than the minimum percentage of marks or grades specified for the semester end examination in that course.

3.3 Curriculum Organisation

After the ten year common programme of studies, primarily of language skills, scientific literacy, basic mathematical and social skills, cultural heritage of the country, issues relating to political, economic and social life and environment, the stage is ripe for exposing the students to differentiated and specialised indepth courses in humanities, social sciences, science, mathematics, commerce and the like on the one hand, and a variety of vocational courses on the other. Thus, according to one of the most important recommendations of the Kothari Commission, the curriculum at this stage is to be organised under two streams, the academic stream and the vocational stream. However, there is a need to ensure that appropriate linkages between the two are not only maintained but systematically strengthened.

3.4 Academic Stream

The objectives of academic courses at this stage may be:

- to expose learners to higher levels of knowledge in different disciplines;
- to introduce them to different ways of collecting and processing data and information under specific disciplines, and help them in arriving at conclusions and generating new insights and knowledge in the process;
- to promote problem-solving abilities and creative thinking in the 'citizens of tomorrow;
- to cope with the changing demands of a society committed to use science, technology and informatics; and

- to assist students to explore their interests and aptitudes in order to choose appropriate careers for shaping their future.

3.5 Scheme of Studies

The curriculum at this stage will comprise:

(i) Foundation Courses; and

(ii) Elective Courses

(i) Foundamtion Courses

At the higher secondary stage, students opt for academic or vocational courses. However, they all need to have a foundation course. Nevertheless, the component of general education is to be kept to the minimum by incorporating in the curriculum only a few but highly significant elements. The common component of curriculum thus, would consist of: (i) language and literature, (ii) work education, and (iii) health and physical education, games and sports.

Language : The objective of teaching language as a component of the Foundation Course is to nurture among learners advanced communication and negotiation skills, higher order reading, writing and study skills and a humane, appreciative and futuristic approach to life and its various manifestations.

Whether the students are preparing to enter life (the world of work) or moving upward to higher academic or professional courses or vocational stream, the study of language in its general and specialised form equips them with effective communication and negotiation skills, higher order reading, writing and study skills and a thorough vision of their field of study or work. The study of language prepares a learner both to learn and use language effectively in the classroom, the community and the workplace.

The different texts in the language course materials broaden learners' mental horizon, liberate them from prejudice, dogma and superstition and foster in them the desired personal and social values, an awareness of and pride in the great artistic, literary and cultural tradition of the country and a deep understanding of the social psyche of the nation. The study of language and literature would ensure

better mental health for the learners through exposure to finer human emotions, sentiments, mental conflicts and their resolution.

The choice of the language to be studied at this level under the Foundation Course should be left to the learner's personal preference and perceived needs.

Work Education : The final shape of the emerging India to a large extent, will be determined by the commitment to work ethics in its schools. The country's philosophy and attitude toward work, its efforts to develop skills and healthy work habits, and its resolve to improve productivity in every walk of life would depend, mainly, on the place it assigns to work education in schools, in and outside the classroom. This explains why work education finds a place in the Foundation Course curriculum meant for the academic stream at the higher secondary stage.

The programme may be linked with one or more subjects or it may be even independent of subjects, if necessary. Special efforts, however, may be made to establish linkages with the subject areas and more particularly with the local environment and developmental activities in the neighbourhood. Taking up long term developmental projects in a village or city slums under the auspices of the school would provide practical experience and insights into the social matrix and economic problems and processes. It would help in generating socially desirable values. These developmental projects can be in the areas of adult education, afforestation, water management projects, road building, and the like.

The Generic Vocational Course (GVC) meant for the students of the academic stream cuts across various vocations and aims at developing employment related generic skills needed by an educated work force regardless of the persons' occupations. It would improve the quality of general education by developing key competencies and transferable skills for the technology oriented society.

Health and Physical Education : Health, physical and mental, is the primary wealth in life. Therefore, health and physical education must be perceived as an integral part of curriculum at any stage of education. It should also contain elements of adolescence education and sex education.

Apart from the regular physical training, athletics, games, sports, yoga and physical fitness exercises should receive due attention at this stage as a part of physical education and physical culture. Improvement of local sanitation and public health services should form part of fieldwork under the course.

(ii) Elective Courses

The elective courses will have to cater to the varied and heterogeneous clientele. While quite a few of the students may be preparing for entry into tertiary education, many more would be preparing to enter the world of work.

The traditional courses of study in well established disciplines retain their place. However, some new potential subjects of study have also emerged. These include computer science, bio-technology, genomics, yoga and environmental education, for example. The real challenge for educators lies in identifying and planning courses of applied nature that may have adequate employment potential or immediate and direct utility in life. An equally great challenge lies in planning essentially inter-disciplinary courses. Perhaps, the areas like conservation education, consumer education, legal literacy, productivity education, population education disaster management, and family life education, could be explored fruitfully.

A student would be required to choose three elective courses out of the subjects prescribed by the boards. The list of courses may include modern Indian languages and their literature, Samskrit and its literature, classical languages and their literature, English (Academic and Specialised), other foreign languages, physics, chemistry, biology, mathematics, computer science, geology, political science, geography, economics, history, sociology, psychology, philosophy, fine arts, sculpture, instrumental music, vocal music, home science, accountancy, business studies, engineering drawing etc. The list is not exhaustive. It would be essential to review the list of courses periodically in collaboration with various interest groups, such as industry, business, universities, employment and manpower specialists and common people represented through parents, artists, social workers and political representatives for effecting meaningful changes in tune with the changing needs of the society and those of the individual.

It is a common practice with the boards of secondary education to put elective courses under groups like science, commerce, humanities, etc. But it would be more appropriate to list all the courses together without dividing them into mutually exclusive groups which may defeat the real spirit of diversification, flexibility and functional utility. To overcome the related issues of management, certain practices from open learning systems can be borrowed by the conventional system. It may also help in promoting inter-disciplinarity.

3.6 Instructional Strategy

New and dynamic techniques including the use of electronic media are to be adopted with a view to inculcating among the students curiosity, encouraging self-study and nurturing problem-solving abilities. Emphasis has to be on learning rather than on teaching, therefore, seminars, tutorial assignments, problem-solving sessions, group discussions, laboratory work, project work and home study will constitute integral parts of instructional programmes and a credit for each activity will be given in continuous sessional evaluation.

3.7 Instructional Time

After taking into account the number of days required for organising evaluation activities, tests, examinations, school functions, etc. a minimum of one hundred and eighty actual instruction days in a year must be made available for effective instruction.

It has to be impressed upon schools that the time allocated to the foundation course should not be encroached upon by the elective courses or vice versa. Roughly sixty percent of the instructional time can be set apart for the instruction of elective subjects and forty percent for the foundation course.

3.8 Vocational Stream

Introduction of the vocational stream was a recommendation of the Kothari Commission (1964-66) and it had far reaching consequences in the context of providing skilled manpower enriched with entrepreneurial skills and competencies. The National Policy on Education, 1986 (revised 1992) set a target to cover twenty-five per

cent of the higher secondary students under vocational courses by 1995. But, so far, we have reached the enrolment of only nearly five per cent. In order to meet the required targets and also respond to the emerging challenges, vocational education needs to be given a high priority.

The nature of technological advancement and the highly competitive world demand continuous upgrading of knowledge and skills for every person in every walk of life. While opportunities for formal employment in organised sectors are now decreasing, they are increasing in service sectors. Skills necessary for self-employment and entrepreneurship are to be provided to all the students entering the field of vocational education.

3.8.1 Vocational Education for All

Up to the secondary stage, provisions exist for giving the students an opportunity under work education to do work. There is also a provision for an alternative scheme of pre-vocational education programmes at the secondary stage. It is followed by the generic vocational course in the academic stream and also the vocational courses at the higher secondary stage.

Vocational courses are designed as self-contained modules specifying details of the theoretical aspects or basic scientific principles and the practical operational details. Schools will assess the need, relevance and potential of the courses before offering them to students. Their duration may vary depending upon their nature and requirements. These courses in the formal school system would help in enhancing the employability of the students joining the world of work.

The vocational education stream will also have to find its due place in alternative schooling especially in the open learning system. Majority of students leave school after Class X on different grounds. A large number of them may look for an alternative route to learning which suits their interest and also develops their earning capability. The vocational education programme being flexible and modular in nature provides such opportunities. These programmes may also cater to the requirements of adults — neo-literates as well as semi-skilled and non-skilled workers. The non-formal vocational

programmes with emphasis on entrepreneurship and the non-traditional and emerging technologies should be specially geared to the needs of the out-of-school girls. In order to meet these requirements, multi-entry and muti-exit modular courses of varying durations may be planned.

The vocational education programme designed to meet the varying needs of the socially disadvantaged groups, such as women, scheduled castes, scheduled tribes and physically challenged persons, would help them acquire suitable productive skills. It will make their lives more meaningful as they will be economically independent and self-reliant. It would be an important step toward their social and economic empowerment.

Vertical and lateral linkages need to be developed in order to offer better career options to vocational students and to give respectability and acceptability to the vocational education programme.

3.8.2 Excellence

Vocational education is often perceived as a second rate education and the excellence of attainments therein suffers in the process due to a variety of reasons and prejudices. While all attempts have to be made toward achieving excellence, it may be borne in mind that the perceived inferior status of vocational education is a global concern. It is also a relative notion. What may be inferior for a certain group of learners is a preferred choice for others. Some shifting of priorities in the matter of choice is becoming evident when pressure from the non-remunerative general education courses is getting transferred on to the vocational areas. More of this shift would be forthcoming in the near future. This is clearly indicated in the private sector vocational courses in the areas of emerging technologies.

Competency based curricula have a great role to play in ensuring excellence. They also help to provide comparability of standards wherever desirable. If the country offers a first rate vocational education channel, its excellence will automatically attract a much larger number of students than at present.

3.8.3 School — Industry Linkages

Linkages between schools and industries catering to the areas

relevant to vocational courses will be an important feature of vocational education. The school enters into a mutually beneficial relationship with a nearby industry to share its facilities, teachers, etc. and to provide opportunities to interns. Such a system is also available through the Apprentices Act. In many countries, the industry eventually employs the workers trained in it. It substantially reduces the cost and time spent in the schooling process. The curriculum for such training is largely determined by the industry. Such a symbiosis can be developed by schools with both the organised and the unorganised industry.

The term 'industry' in this context includes every such organisation as has direct relevance with the vocational courses offered, and has the potential for employment. As such, vocational education has to cater to the needs of an organised sector, service sector, rural and agro-based industries, agriculture related vocations, business and trades and other crafts.

In order to have experiences related to the world of work, the learners shall have to have interactions with outside organisations, agencies and community at large. The schools shall have to play an important role in establishing these linkages.

3.9 Scheme of Studies

At the higher secondary stage, the vocational education programme aims at developing through diversified courses skills and related knowledge required for a specific occupation or a group of occupations to prepare children for the world of work, especially for self-employment. The courses for the vocational stream will consist of:

(i) Language

(ii) General Foundation Course,

(iii) Health and Physical Education, and

(iv) Vocational Electives.

Vocational education covers a wide variety of areas like agriculture, engineering and technology (including information and communication

technology), business and commerce, home science, health and para-medical services and humanities. Each area in itself comprises a large number of special courses.

The courses will be modular in nature catering to some specified competencies based on the credit system. Accumulation of a prescribed number of credits after successful completion of these courses will be the requirement for the award of a certificate. The vocational courses so offered will have in-built flexibility to suit local needs and the needs of the target groups in order to enhance their relevance and effectiveness.

With the phenomenal strides of information and communication technology and globalisation of economy, the spectrum of areas for which competency and skills need to be developed through vocational education has become very wide. On the one hand, there will be need to develop manpower in the use of information and communication technology so as to spread its applications even into the remote areas and, on the other, the vocational requirements of rural India in agriculture and agriculture-based technology will have to be met. In addition, one cannot forget the traditional artisans and craftsmen. Their skills and competency have to be passed on to the new generation. Formal courses in these trades and crafts will make use of modern technology to improve efficiency and quality, and at the same time, to overcome drudgery traditionally associated with these trades and crafts. These should receive adequate recognition and, wherever necessary, due certification.

(i) Language

The study of language would take care of communication skills which in no way are less important for students pursuing vocational courses. The only, but highly significant, difference would be in organising the language courses in such a way that they take care of the grammatical structures and additional vocabulary peculiar to the trade or vocation of each student. In addition, there would be units on culture and literature to cater to the emotional and intellectual growth of the learner and the harmonious growth of his personality. The choice of the language may be determined by the learners' need and the infrastructural facilities available in the system.

(ii) General Foundation Course

The General Foundation Course for the vocational stream will mainly comprise general studies, entrepreneurship development, environmental education, rural development and information and communication technology. The course in general studies is the extension of the foundations already laid during the first ten years of schooling. Its purpose is to sensitise the youth to the social, economic, political and moral or ethical issues of contemporary India and the world. Entrepreneurship development including salesmanship is necessary for self-employment and, as such, forms an important part of the general foundation course.

Addressing environmental issues at the grassroot level is necessary for sustainable development. Therefore, the students of vocational education, who are expected to enter the world of work at an early age, have to be made aware of the concerns and issues related to environmental conservation and development.

In a country where nearly two-thirds of population lives on agriculture, the rural areas have a tremendous potential for providing self-employment opportunities. Rural development, therefore, forms an integral component of this course.

Another significant development of the day is the use of computers in every walk of life which makes the knowledge of Internet, e-mail, and e-commerce absolutely essential. Hence, information and communication technology is also to be included in this course.

(iii) Health and Physical Education

At every stage and in every stream of schooling, opportunities for regular physical training and activities must be provided for physical fitness. However, for the students of vocational courses, the exercises and activities involving less of physical strain will be more suited because these students have to undertake strenuous physical activity in their practical work and on the job training in the regular vocational courses. Keeping this in view, physical activities like yoga, meditation, and light exercises involving posture change, and relaxation may be recommended. Improvement of local sanitation and public health should form part of the fieldwork of this course.

(iv) Vocational Electives

Vocational courses cater to the requirements of varied and heterogeneous clientele. Majority of the pass-outs from the vocational stream will soon be entering the world of work. Students have to be given a large number of options based on the local needs, employment opportunities for wage employment and self-employment, their aptitude and interest, and the geographical location of the school. Students will, thus, get an opportunity to choose courses in the areas of their liking. Within each broad area, a number of courses for developing specific competencies are to be prepared. This can be done after a detailed analysis of the functions and tasks expected to be performed by a worker in that area.

The possible employment opportunities, for wage employment as well as self-employment, are identified by experts drawn from the relevant fields. The related competencies in terms of knowledge, skills and attitudes are identified and the learning experiences are then organised accordingly. Grouping of similar types of learning experiences to form a module to facilitate the teaching-learning process and to manage the implementation of the vocational education programme is then initiated. A careful review of and modifications in the grouping of the options from time to time would also be desirable. Some kind of effective mechanism for standardisation and quality control of the existing courses is needed to enhance the credibility of the vocational courses and the acceptability of the pass-outs among potential employers.

3.10 Instructional Strategy

Vocational education programmes require well tried out strategies for effective teaching-learning and the practice of vocations and entrepreneurship. Practical training is an essential component of the vocational courses, as it helps in developing the required competencies with adequate precision. For this purpose, schools need to make sufficient provision for exposing the students to work at the training-cum-production centres and for integrating their knowledge with skills through job training and project work. The competencies thus acquired would be further reinforced and refined during apprenticeship.

Training-cum-Production Centres

Schools providing vocational courses should strive to have their own training-cum-production centres. These centres provide to the learners real life experiences and an opportunity for acquiring on-the-job skills and developing entrepreneurship abilities. Thus, the schools offering vocational courses may undertake semi-commercial ventures in production and services to generate income. It will provide additional incentives to the learners and teachers in monetary terms as they will share the profits. It is also a sound pedagogical practice. The community should be suitably involved in marketing the products.

Integration of Knowledge and Skills

During the transaction of the vocational courses, a continuous integration of knowledge and skills takes place in the schools. It, however, needs to be augmented through on-the-job training and project work. In order to be enriched with practical experience, the students are taken to a service centre or repair centre or production unit to work in a real life situation under the guidance of an expert practitioner. There must, therefore, be provision for on-the job training for certain number of hours for every vocational course. The students may be evaluated jointly by the teacher and the expert practitioner.

Students are to be given project work to be done individually or in small groups. It will help them consolidate their learning, learn to communicate, and achieve the time target.

Apprenticeship

Under the Apprentices Act, many of the vocational courses currently being offered are expected to be providing apprenticeship training to the pass-outs. Apprenticeship training enables the pass-outs to get acquainted with the industrial environment and to get first hand experience of working in an industry and its work culture. In order to be acceptable to an industry under the provisions of the Apprentices Act, a student would have to demonstrate the competencies he is supposed to have acquired. However, apprenticeship is not a substitute for the practical work or workshop training in the school.

4

Evaluation

Teaching for successful learning cannot occur without high quality evaluation. Evaluation , therefore, needs to be integrated with the process of teaching and learning. The greater the integration the better the outcomes of learning. Hence, evaluation has to be so designed that it can be used as a powerful means of influencing the quality of what teachers teach and what students learn. But, while doing so special care must be taken to ensure that it is humane and it enables the learner to grow into a responsible and productive citizen. Not only this, evaluation has also to provide constant feedback regarding the effectiveness of course — contents, classroom processes and the growth of individual learners besides the appropriateness of the evaluation procedures. It must, however, be flexible enough to the extent that it can be experimented with and adapted according to the specific situations and needs of the learner groups.

Evaluation is a systematic process of collecting, analysing and interpreting evidences of students' progress and achievement both in cognitive and non-cognitive areas of learning for the purpose of taking a variety of decisions. Evaluation, thus, involves gathering and processing of information and decision-making.

4.1 The Present Evaluation System

The present system of evaluation at school stage suffers from a number of imperfections. The first and foremost shortcoming of the evaluation system is that it focuses only on cognitive learning outcomes and completely ignores the non-cognitive aspects which are a vital component of human personality. Even in cognitive areas it lays too much emphasis on memorisation and little on abilities and skills that require higher mental operations like problem-solving, creative thinking, summarising, inferring, arguing etc.

3.11 Instructional time

For an effective implementation of the vocational education programme, the provision of adequate instructional time as per the requirements of various courses needs to be ensured. It has to be impressed upon the schools/agencies that the time allocation as suggested in the Programme of Action (1992), i.e., thirty per cent time for language, the general foundation course, and health and physical education, and seventy per cent time for vocational courses may be adhered to.

3.12 Evaluation and Certification

Assessment in vocational courses has to be performance oriented. Continuous and comprehensive evaluation, with a built-in procedure for remedial measures, will ensure effective achievement of the requisite competencies. A complete and comprehensive record of the assessment of the students' performance including evidences reflecting their personality traits will be maintained. Both process and product assessment are important for correct evaluation. The certificate issued will make a mention of the competencies acquired along with the credits earned therein.

3.13 Open Learning System

Open learning system is increasingly becoming popular because of its capacity to provide education of comparable standards in a flexible and learner friendly manner, particularly to those who could not get access to the formal system of education obtaining within the country. At the higher secondary stage, the open school system may be utilised fully for both the streams, academic and vocational. It is visualised that many students would like to go in for vocational courses at this level through the open learning system as it provides freedom in the combination of subjects and in the scheme of examination. For maintaining parity of standards, the formal and open learning systems can have separate but comparable syllabi in each subject. This comparability of curricula of the two systems would help learners move easily from the open learning system to the formal schooling system and vice-versa. Such a symbiotic relationship will be of great advantage to the learner.

Examinations in their present form are not the real measure of students' potential because they cover only a small fraction of the course content that the students strive to learn over a period of one year. Nor do they provide for the application of multiple techniques of evaluation like oral technique, observations, projects, assignments etc. as they resort only to the use of written tests.

Another shortcoming of the present examination system is that the results are declared in terms of raw marks which suffer from a number of inadequacies ranging from the subjectivity of the examiner to the inherent limitation of the 101 point scale that satisfies neither the criterion of absolute zero nor that of absolute hundred.

The Class X public examination is held in such an awe by the society that its pattern percolates down even to the initial stages of schooling. As a result even small children are prepared along the lines of board examinations right from the beginning and the significant components like diagnosis and remediation seldom become a part of the system. Keeping all these factors in view, it will be appropriate and very timely for the country to pay heed to the recommendation of the *Programme of Action*, 1992 that "the predominance of the external examinations (should be) reduced." (21.1.3)

It is no secret that teachers adjust their teaching to testing which means laying extra emphasis on the maxim, "Whatever is tested is to be taught and whatever is not tested is not to be taught." This backwash effect of examination which is currently dominating the system frustrates the very concept of mastery learning as it leads to selective teaching and learning. The existing examination system also suffers from an inhuman rigidity which allows little flexibility of any kind. It would be ironical if the learner centred approach of education is made to co-exist with the system centred examination.

Yet another flaw of the existing system is the undue importance attached to the results of examinations by the society in the wake of growing competition in every field. This creates psychological fear and tension in the minds of the students to such an extent that various kinds of malpractices in the examinations become rampant and the fear of failure sometimes leads to extreme measures like suicides.

4.2 Using Evaluation

Evaluation in schools needs to be profitably exploited for the development of both cognitive and non-cognitive capacities. This warrants adequate emphasis on both the formative and summative forms of evaluation. While formative evaluation is done during the course of instruction with a view to improving students' learning, summative evaluation is done at the end of the academic year to promote students to the next grade. Both these types of evaluation are essential and, therefore, need to be carried out to realise the goal of bringing about qualitative improvement in school education. The main purpose of formative evaluation is to monitor the instructional process in order to determine whether learning is taking place as planned. The result of such evaluation needs to be used for designing and providing remedial measures for slow learners and enrichment programmes for the brighter ones. On the other hand, summative evaluation needs to be used for classification of placement and prediction of future success apart from promotion to the higher class.

Analyses and interpretation of the evidences collected through both the formative and summative evaluation may be viewed in three different ways; first, by assessing the students' progress with reference to their own selves (self-referenced), secondly, with reference to the criteria set by their teacher (criterion-referenced), and thirdly, with reference to the progress made by their peer groups (norm-referenced).

Evaluation must facilitate all-round development of students. It will, therefore, be desirable to have school-based system of students' evaluation, both formative and summative, from Classes I-XII. However, at the pre-primary level evaluation will be entirely formative in nature and only at the end of Classes X and XII will the final examinations be conducted by the boards as far as the scholastic areas are concerned. The school-based evaluation, which will be in the form of continuous and comprehensive evaluation, will incorporate not only the scholastic areas but also the co-scholastic areas of students' growth. In Classes X and XII, however, the performance of students in co-scholastic areas will be assessed by the school and conveyed to the board for inclusion in the statement of marks or grades awarded in the scholastic areas of study.

4.3 Features of Evaluation

- Evaluation will be humane in nature. It will help students grow as social beings and thus save them from unnecessary pain, anxiety, harassment and humiliation.
- Evaluation will be the responsibility of the teacher who teaches the students and is responsible for developing the requisite healthy attributes in them.
- Evaluation will be consistent with its purpose and will provide a reliable and valid measure of students' performance.
- Evaluation will reflect the outcomes of each learning intervention and would provide all the students the same opportunity to display their individual potential. As such, evaluation will be varied and consistent and thus admit of the use of multiple techniques of measurement.
- Evaluation will be built in with the teaching-learning process and thus will be carried out through the entire period of education.
- Evaluation will take into account both the background and the prior experiences of students.
- Alternative evaluation procedures will be used for students with special needs making it humane, learner friendly and flexible.
- Procedures for grading and their reporting will be appropriate and easily understood by one and all.
- Evaluation will restore the faith and trust of masses by ensuring transparency in the procedures.
- Modern technology will be used not only to improve the management of evaluation system but also to administer tests using computer networks.

4.4 Evaluation at Different Stages

4.4.1 Early Childhood Education (ECE)

At the pre-primary stage the child learns through joyful activities. And, therefore, there must not be any formal evaluation. Even the remedial measures may be made to appear as a part of the learning process without making children conscious of it.

4.4.2 Primary Stage

Children at this level are at a formative stage where the pace of learning and personality development are quite fast. Evaluation at this stage will, therefore, be formative in nature with adequate emphasis on both continuity and comprehensiveness. In Classes I and II, the children will be evaluated using observations and oral techniques on the basis of their participation in classroom activities. They will not even know when they are being evaluated.

In Classes III to V, there will be a slight shift in evaluation in that it will become slightly formal. The children at times will know when they are being tested. Though observation and oral techniques will continue to be used, paper and pencil tests will also form part of evaluation.

Emphasis at this stage will be laid on the use of diagnostic tests for identifying hard spots of learning and organising remedial measures. Criterion-referenced tests will be used periodically for assessing the acquisition of competencies to the level of mastery. Evaluation of co-scholastic attributes will be carried out continuously using observation and rating scales and will be reported once in three months. Student portfolios will be meticulously prepared for maintaining cumulative record of students' progress both in scholastic and co-scholastic areas.

The performance of the students will be indicated using three-point absolute grading in respect of scholastic areas and three-point direct grading in respect of co-scholastic attributes.

4.4.3 Upper Primary Stage

Students' evaluation at this stage will undergo some changes in view of their increased maturity level. Apart from the oral and written tests, assignments and project work will also be used for the purpose. Continuous and comprehensive evaluation will also continue with special focus on diagnosis and remediation for weak students and enrichment for the brighter ones. Criterion-referenced tests will be employed periodically for ensuring the acquisition of competencies upto the mastery level in different curricular areas. The evaluation of co-scholastic attributes will be carried out continuously using

observation, rating scale and check-lists and will be reported quarterly. Self-evaluation by students and peer evaluation may also form part of the total evaluation procedure.

At this stage, the five-point absolute grading will be used for indicating students' achievement level in scholastic areas and the three-point direct grading in co-scholastic areas.

4.4.4 Secondary Stage

One special feature of evaluation at this stage will be that no student will be declared pass or fail. Courses will be modularised for the purpose of organising them into four semesters. The evaluation will be predominantly school-based using the continuous and comprehensive evaluation mode with special emphasis on diagnosis and remediation aiming at ensuring the mastery level. Students' achievement in different subject areas will continue to be assessed periodically by employing criterion-referenced tests. The performance of students will be graded on a nine-point scale using absolute grading. Attributes pertaining to the co-scholastic areas will be assessed through observation, check-lists and rating scales and will be reported using a five-point direct grading. Cumulative record cards for individual students will be maintained indicating their performance assessed through various tests, rating scales etc. The portfolios of individual students will also contain their self-appraisal and peer evaluation besides their cumulative report cards.

4.4.5 Higher Secondary Stage

The evaluation processes will be increased in order to prepare students well not only for tertiary education but also for life.

The courses will be organised in four semesters but will be based on the credit system. The first three semester examinations will be the responsibility of the school while the fourth semester examination will be conducted by the board. The system so designed will provide for flexibility and thus enable the students to earn credits at their own pace. Tutorials will also be introduced at this stage and given proper place in the final evaluation scheme. Schools will continue to focus on the mastery level learning through criterion-referenced testing whereas the board will focus on norm-referenced testing.

The performance of students in school-based examinations will be graded on a nine-point scale using absolute grading and grading by directly converting marks into grades. However, the boards may use nine-point grading on the curve for the purposes of classifying the students in public examination. The assessment of co-scholastic areas will be carried out by the school using five-point direct grading which will be recorded semester wise. The grades for scholastic and co-scholastic areas for the third semester and grades only for co-scholastic areas for the fourth semester will be conveyed by the schools to the boards for the purpose of showing them on to the transcript. The system will provide for opportunities to improve upon the grades to those who wish to do so.

4.5 Maintaining Standards

The school-based evaluation system will be augmented by undertaking periodic achievement surveys in language, mathematics, science and social sciences at the end of every stage of school education to keep tabs on the general health of the school system. Such surveys will be conducted by using standardised achievement tests. The results of these surveys will be used for not only developing institutional, regional, state and national profiles but also for planning and designing appropriate interventions for improving the standards.

4.6 The Present Proposition

The earlier Curriculum Framework documents of 1975 and 1988 have also reflected on some of the areas of concern like continuous and comprehensive evaluation, abolition of pass and fail, taking away the predominance of external examinations, implementation of semester system at the secondary stage and introduction of grades in place of marks. The 1988 document, however, suggested a shift from summative evaluation to formative evaluation. It also laid emphasis on defining the minimum levels of learning at all stages of school education, improving the management of examinations and setting up a National Testing Service. Subsequently, the *Programme of Action* (POA), 1992 put stress on the development of a national examination reform framework and on setting up a National Evaluation Organisation.

It is evident from the field experiences that systematic efforts have yet to be made to implement these reforms in the country. Only sporadic attempts in this direction have been made by individual institutions which is why the results are far from satisfactory.

The present proposition of evaluation in schools reiterates the reforms that have yet to be implemented. However, it is different from the earlier ones in a number of ways as it :

- lays adequate emphasis on both the formative and summative evaluation covering scholastic as well as co-scholastic abilities;
- underlines the significance of the comparison of a student's performance with reference to her/his own-self, criterion set by the teacher and the performance of her/his peer group;
- details out stagewise evaluation procedures starting from the pre-primary to the higher secondary stage of schooling;
- lays stress on mastery learning approach by using diagnosis and remediation for weaker students and enrichment programme for the brighter ones;
- recommends the use of different methods of grading scholastic and co-scholastic areas and also for school-based and public examinations;
- pleads for the application of different point grade systems for different stages of school education;
- encourages the use of portfolios for record keeping and reporting;
- urges the use of both self and peer appraisal as vital components of the continuous and comprehensive evaluation;
- favours the introduction of tutorials at the higher secondary stage;
- proposes the introduction of semester system at the secondary stage and semester system with credits at the higher secondary stage;
- values the use of alternative evaluation procedures for learners with special needs;
- argues for the conduct of periodic achievement surveys in different subject areas at every terminal stage of schooling; and
- favours the application of modern technology in evaluation.

4.7 National Evaluation Organisation

There are thirty-four boards of secondary and higher secondary education in the country which are conducting public examinations after completion of ten and twelve years of schooling. There is a wide disparity among these boards with respect to the standards of the examinations. No national or common standards of achievement are available with which the standards in the examinations conducted by these different boards could be equated. Further, it appears that what is being tested through these examinations is not necessarily relevant to life in general or the world of work. This has led to multiplicity of entrance tests conducted by different professional institutions in areas such as medicine, engineering, management. This has put a lot of unnecessary strain on the minds of both the students and their parents and created various other problems like malpractices and wasteful expenditure.

In order to overcome these problems associated with examinations, there is an urgent need to set up a national level body which would ensure uniformity of standards in examinations and evolve national standards against which the performance of the students from different states could be compared. In the fields of medicine and engineering, such efforts have already been initiated. On similar lines, a national evaluation organisation for the general academic courses could also be set up. This will help project the true educational profile of each state at the macro level and of individual institutions at the micro level. In turn, it will also improve the contents of the courses, the teaching-learning processes and the performance of students.

The *National Policy on Education* (1986) and the *Programme of Action* (1992) have visualised that the "National Evaluation Organisation will be developed as a quality control mechanism to organise nationwide tests on a voluntary basis so that norms can be evolved for comparability of performance and also for conducting independent tests." The broad idea is to have a non-profit organisation which will perform a number of functions ranging from developmental activities to conducting research in the areas which have direct bearing on students' evaluation.

5

Managing the System

A curriculum framework indicates the directions in which the educational system of a country has to proceed in order to implement its educational policy. The impact of the framework on the educational scenario hinges on —

- dynamic nature of the framework in responding to a wide variety of cross-cultural setting;
- strong political will and insight;
- committed management support; and
- comprehensive understanding of the framework in letter and spirit among the teachers.

The task of curriculum renewal calls for multipronged strategies involving different agencies. The major interventions required for implementing the proposed curriculum would include:

- uniform implementation of a common educational structure, i.e., 10+2+3 pattern of education all over the country, particularly a common status of the +2 stage, that is the higher secondary stage, within the school system;
- uniform national acceptance and implementation of the two-year school readiness pre-school education programme as an integral part of the primary school stage;
- development, production and introduction of a new generation of instructional packages including textbooks and multi-media materials;
- an effective strategy for the preparation and orientation of teachers with a thorough understanding of their subjects and a sound pedagogical base;
- orientation of other educational functionaries and the community at large to the educational concerns, the new instructional

packages and the recommended strategies of curriculum transaction;

- strengthening of the managerial and technical support system and development of professional capabilities at all levels of educational activity; and
- continuous monitoring and introduction of corrective and remedial and enrichment measures in the implementation of curricular transaction through educational management at all levels.

Success in the on-going process of curriculum renewal requires the following major initiatives:

5.1 Professional Support for Curriculum Development

During the last couple of decades the national and state educational authorities have taken several initiatives to help the curriculum development process on a continuing basis by setting up several national, state and district level bodies and state boards of education. State textbook boards were also established in almost all the states for commissioning of authors and preparation, production and distribution of textbooks. It is very important now that coordinated decentralised curricula, syllabi and try-out materials be developed following the basic design of the national curriculum framework and accommodating the local needs and aspirations of the people in the different regions. The NCERT, the SCERTs and the prominent Non-Government Organisations (NGOs) would all render required assistance in this venture. However, empowerment of teachers as curriculum developers would be imperative.

5.1.1 Preparation of Innovative Instructional Packages

Detailed curricular guidelines and model syllabi in all the subject areas will have to be developed along with the coverage in each subject area, its depth and treatment for each stage and grade, keeping in view the learning outcomes to be attained by the learners. The scheme of studies must ensure equitable importance to the scholastic as well as co-scholastic areas. This has to be followed by

development, production and introduction of packages of curricular materials.

A major change in the approach, planning, preparation, production and distribution of all the teaching-learning and training orientation materials is the first requisite for any significant improvement in curriculum transaction. Competency-based and process oriented materials to facilitate joyful self-learning and self-directed learning experiences in both the formal and the alternative education modes will have to be developed. There has to be a complete modular package of textbooks, workbooks, teachers' handbooks and multimedia materials. These materials must respond to our contemporary concerns, approaches and thinking at all the stages of school education.

In the present scenario, it has also become imperative to develop and disseminate appropriate encapsulated orientation materials for parents, community in general and the managers of education as they are also powerful agents for effective curriculum transaction. Important key ideas and issues are to be put before them in an easily comprehensible form. This will ensure social regeneration through education.

Modular instructional packages for introduction of instructions and activities in the area of common core components and value education will have to be prepared and made available to all the states/UTs for adoption, adaptation and translation into all the national languages. In addition, audio-video programmes on themes related to common core components and values may also be developed and disseminated.

5.1.2 Environment and Community as Resources

Environment, both rural and urban, and community are great resources for curriculum development. The vastness and openness of the serene rural environment with its fields, forests, ponds, rivers, trees, orchards, birds and animals is a major provider to curriculum development. Similarly, the busy business centres, industrial complexes, neat and clean residential clusters and the not so clean and not so healthy slum areas of cities provide a different kind of input to the process of curriculum making. Flexibility of procedures,

instructional materials and instructional arrangements supported by training and enrichment materials for teachers prepared by the local educational institutions and authorities can easily provide the requisite rich local input of the environmental resources in the curriculum. Community can also provide physical and other resources to schools and alternative schooling centres through voluntary contributions and also by providing services of persons having special skills, aptitudes and interests.

5.1.3 Strengthening of Research Base

Strengthening of links between the available infrastructure of educational research and the agents of curriculum development and materials production is one of the imperatives. The NCERT, the SCERTs, other similar institutions and the university departments of education will have to encourage, sustain and carry out educational research and disseminate their research findings to feed and strengthen the curriculum development centres in a regular manner. Besides, the Non-Government Organisations involved in different educational projects may make their experiences and research findings available for the development of curriculum and curricular materials. Finally, the teachers in the field can contribute to the entire process of curriculum development by pooling up their experiences, observations and research findings.

5.1.4. Institutional Appraisal

Designing a professional appraisal system for institutions will go a long way to ensure effective curriculum transaction and overall improvement in the educational scenario of the country. A carefully implemented gradation of institutions on the basis of their performance will require positive discrimination for the capacity building of some of them which will ensure some kind of uniformity of standards. States will have to devise and develop suitable criteria and systems for this kind of gradation of institutions.

5.2 Professional Support for Teacher Education System

Teachers' role in the development and implementation of curriculum is vital. All the changes and developments taking place in school

curriculum, therefore, have necessarily to percolate in the teacher education programmes. The following would ensure this:

5.2.1 Teacher Preparation Programmes

The pre-service teacher preparation curriculum will have to be relooked at and despite its having been revised recently, new concerns and issues will have to be incorporated therein. This would take some pressures off the in-service teacher education programmes later. Pre-service and in-service education are stipulated to be inseparable and continuity between the two has to be maintained. In the pre-service teacher preparation programmes adequate emphasis on the content knowledge of different subject areas and proper integration of methods of teaching with the content of school subjects and a strong component of 'Evaluation' will have to be ensured. Besides, understandings and competencies relating to different elements of curriculum development will have to be specially included in these programmes in both theoretical instruction and practical training.

However, continuing education of in-service teachers needs attention because all their initial education and training may not remain relevant and effective because of the present rate of change in content and pedagogy in the national and world scenario. Teachers have to be sensitised about the new curricular concerns, issues and transactional approaches. For this, print materials in simple, jargon free languages of the region and also audio-video materials need to be developed and disseminated through direct and distance modes. The in-service training shall not be just a one time affair but shall have to be run on a sustained and regular basis. A cascade model of training key resource persons and resource persons can be followed and a collaborative mechanism for this purpose may have to be evolved among the various national, state and district level agencies. Teleconferencing as an effective strategy of providing training to the teachers may also be profitably utilised.

5.2.3 Accountability of the Managers of the System

Initial induction and in-service training of educational functionaries and administrators at the state, district and block levels are also

very vital for effective implementation of the curriculum. They have to be oriented to their own roles and of those working with them and requiring guidance from them. Headmasters and principals of schools have to play the role of managers and facilitators in the entire process of curriculum implementation and, therefore, they have to be suitably trained too. Proper monitoring mechanism would need to be developed at all levels and be institutionalised. This will ensure more accountability and effectiveness among all these administrators, managers and functionaries in their respective roles.

5.2.4 Involving Teacher Preparation Institutions

Curriculum implementation at the national and state levels cannot be left to a handful of institutions, so all the institutions that have capacities to perform these functions will have to get involved in the task. During the past decade a good number of teacher preparation institutions at the elementary and the secondary levels have been established or strengthened. While some of these have specific curriculum and materials development departments, the others by way of their functions are required to provide training to secondary teachers and elementary teacher educators. These institutions will have to be involved in all the areas of curriculum development, its transaction and all forms of teacher education, especially the in-service training of teachers in the new concerns, issues and strategies.

5.2.5 School Complexes as Resource Centres

With the establishment of resource support at the district level through DIETs, the resource support at the sub-district or school complex level needs to be activated and strengthened. These centres could become potential places where teachers could meet and interact, and provide material and manpower resources for school improvement programmes. These centres can support regular and distance education systems as well with libraries, good audio-video equipments and all other training materials and physical facilities. All their physical and human resources, irrespective of their management characteristics, will have to be utilised for facilitating the training of teachers and other personnel from neighbouring institutions. These centres, thus, will provide quality education to

the under-privileged population and also to act as lead institutions in the area. The positive experiences of Block Resource Centres and Cluster Resource Centres may be profitably utilised.

5.2.6 Networking of Teacher Education Institutions

Networks are designed with a view to covering resources and providing synergetic effect. In teacher education, networks could be thought of along both vertical and horizontal lines. To illustrate the point, networks can be designed at the secondary level around one of the Institutes of Advanced Studies in Education (IASEs) so as to develop teacher education complexes. It would provide resource support to secondary teacher education institutions for undertaking innovative programmes for updating and upgrading teacher education competencies and for facilitating professional growth. The teacher education complexes could be used for ensuring the sharing of resources, materials, expertise and experiences.

5.2.7 Monitoring and Evaluation of Teacher Education Programmes

For monitoring and evaluating teacher education programmes, all the five elements of teacher education, i.e., pre-service, in-service, life-long and continuing education, extension programmes and institutionally designed opportunities for professional growth have to be seen as one whole and as a seamless activity.

Besides routine activity of monitoring and evaluation, one of the activities to be undertaken now could be to accredit and grade the institutions. Such an activity is not to be seen as an externally imposed one but as an important prelude to the requisite corrective or remedial measures.

Accreditation essentially involves:

- appraising institutions on the basis of their infrastructural facilities and regular activities;
- grading of institutions in various modes – A, B, C, D and E – according to their physical and personnel resources and the quality of output obtained; and

- corrective or support measures for enhancing the capacity of institutions wherever required.

5.3 Integration of Information and Communication Technologies Into Schooling

With their increasingly ubiquitous presence within and outside the school, Information and Communication Technologies (ICT) have begun to challenge what schools (all over the world) try to teach and the whole basis of assessing the knowledge and skills that students acquire. The process of education can no longer ignore the social and psychological impacts of the technology that structures information and the possibilities that global information sharing opens up. Furthermore, that these technologies affect the way people think and learn has been widely recognised.

Integration of ICT into schools, therefore, has a strong pedagogical rationale and is a natural sequence in the evolution of the schooling process. But this integration has several implications, which clearly make the following demands:

1. The educational planner looks beyond the current classroom, devises updated plans for education in an electronic environment and expands his designs so that the computer becomes more than a subject of study and is not merely integrated into an existing curriculum. It becomes, instead, an integral part of the schooling process.
2. The educator accepts the broad general principles that he is challenged with. These are:
   - creation of a framework for enhancing learning opportunities that computer-based learning material and accessible resources offer;
   - access to information, shared educational goals and pedagogy;
   - access to professional development opportunities for teachers which would enable them to act as facilitators of learning;
   - flexible curriculum models which would embrace inter-disciplinary and cross-disciplinary thinking; and

- development of attitudes that are value-driven, not technology-driven.

3. The curriculum developer re-defines his role. All innovative experiments in the areas of media production, interactive video and multimedia computer software are curriculum development processes. They come to naught without active participation of the curriculum developer.
4. The teacher adopts an instructional design that helps learners master heuristic and algorithmic strategies for tackling new problems using the computer and communication technologies, wherever possible, as opposed to strategies that aim at mastery of discrete units of fixed knowledge.
5. A method of evaluation and assessment of what students learn in ICT-rich environment supported by the computer and communication technologies must evolve, for this environment is going to cause perceptible shifts from:
   - traditional learning atmosphere to a climate of values that encourages exploration, problem-solving and decision-making;
   - didactic classroom teaching to participatory and interactive group learning;
   - linear, sequential reasoning to search for patterns and connections;
   - mastery of fixed body of knowledge to understanding a web of relations between the parts of a whole; and
   - collection of information to processing of information, leading to knowledge management skills.

The traditional tests cannot measure the skills and abilities that result from these shifts.

6. It is only with new skills and perceptions that the teacher can assume her new role as a facilitator of learning and implement and maintain innovations in the classroom. This calls for a new definition of pre-service courses and effective training and orientation programmes for those who are already in the job. The new courses should help teachers acquire skills of using

information technology as well as making the best use of computer technology in curriculum transaction.

5.4 Managing Vocational Education

The management system for vocational education has to be developed in strength, structure and task delineations. Close coordination between the national and state level agencies on the one hand and the sectors dealing with employment avenues and assistance in entrepreneurship on the other needs to be planned and established. A meaningful partnership between the programme implementing institutions and the consumer is essential and, in fact, a pre-requisite for making the scheme popular, functional and effective. A sound programme of vocational education requires extensive and broad-based preparation through work education and pre-vocational education during the first ten years of formal schooling and a comparable period in the alternative schooling mode. The very approach to work education up to the secondary stage needs to be changed and its effective integration with practically all areas of learning has to be achieved.

Strengthening of vocational education would require strong support of researches, innovation and surveys conducted at appropriate levels by the national level agencies and also by the state and district level agencies with effective and functional linkages, both vertical and horizontal. Mechanisms for accreditation and certification will have to be identified. The national level agencies must set standards for developing optimum levels of skill and competency. The issues related to the development of expertise will have to be considered seriously. Serious attention has also to be paid to the task of preparing and inducting quality teachers of vocational education at the higher secondary stage through the pre-service education process. It may have to be ensured that every institution has a core faculty of teachers on a permanent basis, supported by guest faculty and resource persons drawn from community, industry, other organisations and agencies as per the requirement of the course — which may vary over the period. The responsibility of giving in-service education to the teachers of vocational subjects as well as other associated functionaries will have to be shared by institutions at each

level. For this, the first important step would be to identify institutions dedicated to education in the vocational areas. The preparation of relevant teaching learning materials would require deep insight into and thorough acquaintance with the emerging areas of employment and entrepreneurship which the teachers in these institutions would possess in ample measure.

At the district and block levels, every school up to the secondary stage has to provide not only to children but also to their parents adequate information on the avenues and potentialities in the field of vocational education. School should arrange to familiarise the students with the various career opportunities. It should also be possible to relate stories of highly successful vocational pass-outs to motivate and develop positive attitudes among other students. The identified district level resource institutions could be of great help in popularising the vocational stream and giving it credibility in the eyes of the community.

Pre-vocational courses would have to be initiated in all institutions which have provision for the higher secondary level vocational courses. These would help the general category students as well including those who might dropout at the end of the secondary stage. In this context, establishment of production-cum-training centres in schools needs to be experimented with on a large scale. Block level training and resource centres also must be established and sustained.

Block level Vocational Education and Training Institutes are expected to perform multiple roles. On the one hand, they will be offering flexible, modular, competency-based vocational courses catering to the requirements of wider target groups, school dropouts, rural youths, neo-literates, women and other persons needing upgradation of skills in addition to offering courses under formal stream. They will also act as resource institutions for a cluster of neighbouring vocational schools, which may not have necessary infrastructure facilities for offering practical experiences to students.

The objectives of providing quality school education would not be achieved fully without a broad-based and enriched programme of vocational education. Its acceptance and expansion would free the youth of the country from debilitating frustrations.

5.5 Education for Value Development

5.5.1 School Plan

The school curriculum has to contain components that communicate essential values in their totality. Every teacher has to be a teacher of values. Every activity, unit and interaction must be examined from the view point of value identification, inculcation and reinforcement and then deciding appropriate strategy for a balanced and judicious implementation. These values can be attained by stating clearly the school goals, evolving discipline through participation of staff and students, wherever necessary, ensuring two way communication for redressal, welfare services, help to needy students, remediation, re-evaluation and non-rejection of poor achievers, formulating rules that ensure participation of each student in the games, activities and programmes relevant to their interests.

At the elementary stage

- the school assembly, group singing, practising silence and meditation;
- simple and interesting stories about the lives and teachings of prophets, saints and sacred texts of different religions;
- field activities like games and sports, social work leading to the attitude of service (*seva*) to humanity and other creatures, even to Nature and to the precept 'work is worship'; and
- cultural activities, plays etc., on appropriate themes.

At the secondary and higher secondary stages

- the morning assembly, readings from books of wisdom, great literature or an appropriate address by a teacher or a guest speaker;
- essential teachings of the major world religions, comparative study of the philosophy of religions;
- social service during holidays and outside school hours;
- community singing programmes, National Integration Camps,

the National Social Service and the National Cadet Corps, Scouts & Guides programmes; and

- cultural activities, plays, debates etc., on appropriate themes.

Schools may organise joint celebrations of the important occasions and festivals of major religions and cultural groups. This would generate better understanding of and appreciation and respect for one another and create a tolerant and cohesive society.

5.5.2 Support Interventions

The approach has to:

- highlight the values inherent in different subject areas;
- provide students with opportunities for questioning, sharing and respecting each other;
- provide students opportunities for learning democratic principles and processes in the classroom transactions;
- emphasise equality of gender, social castes, classes and religions;
- underline human rights, children's rights, environmental protection, healthy living etc.; and
- make the classroom atmosphere tension free and democratic to enhance values.

5.5.3 Source of Value Inculcation

Teachers

- must have a clear vision of their role in value orientation;
- must be able to identify the potential of different subjects and situations in schools for fostering universal human values and be sensitised about their own influence as role models;
- must be able to understand their own biases and attitudes toward students;
- must sincerely strive to be objective in conduct and classroom transactions;

- must have positive approach to authentic orientation materials related to different religions and religion related values; and
- must be good communicators.

Materials

- The textbooks, supplementary reading materials and other materials for general reading in different subject areas will have to have built in universal human values. These have to be written carefully and reviewed frequently so that they are not counter productive. These reading materials do not have to be direct and didactic in nature.

Other Interventions

- Interstate cultural exchange programmes
- Exhibitions, Bal-melas, Fairs and Folk Cultural Activities
- Appropriate Guidance and Counselling

5.6 Implementing Strategies for Learners with Special Needs

Segregation or isolation is good neither for learners with impairments nor for general learners without impairment. Societal requirement is that learners with special needs should be educated along with other learners in 'inclusive schools'; which are cost effective and have sound pedagogical practices.

The process of bringing learners with special needs into the mainstream in an inclusive school starts with the assessment of their educational needs and preparation of an Individual Education Plan for each one of them in consultation with their parents. Teaching then becomes learner centred. Besides, group learning or cooperative learning and peer tutoring would also be encouraged in an inclusive school. This would bring the learners with special needs into the mainstream, create positive attitude among learners without impairment and foster the attitude and skill of learning together without complexes.

Definite action at the level of curriculum makers, teachers, writers of

teaching-learning materials and evaluation experts is required for the success of this strategy. This has to include:

- developing appropriate supplementary instructional material for learners with special needs;
- making appropriate modifications in the content, its presentation and transaction strategies to facilitate conceptual clarity among learners with different special needs;
- developing and working out appropriate learner friendly evaluation procedures for learners with different special needs;
- preparing teachers with initial induction and sensitising them through in-service education programmes to help them attend to the special needs of the learners with various challenges and equipping these teachers with skills, competencies and strategies required to cater to the diversity in an inclusive setting;
- developing comprehensive guidelines for teachers to define educational goals for all learners in the inclusive setting; and
- mobilising community resources for support to learners with special needs. These could be in the form of resource centres.

Vocational guidance and counselling would assume an extremely significant role to play. The entire process would produce appropriately equipped functionaries to make their contribution in all the departments of the stream effectively.

5.7 Implementing Evaluation Strategies

Successful implementation of any reform requires a combination of strong will and commitment of all the people involved in the process. Reform in the implementation of evaluation strategies requires the following measures:

- Climate building
- Material development
- Capacity building
- Resource mobilisation

Climate Building

Proper and adequate awareness among the masses is the first pre-requisite for the success of any effort at bringing in reform in the area of school education. Conscious efforts, therefore, need to be made through media blitz to educate the community regarding the merits of the proposed reforms and bring about change in people's mind set.

Material Development

Materials have to be developed in keeping with the local specificities and requirements. These will have to be:

- conceptual materials on various reforms like continuous and comprehensive evaluation, grading, semesterisation, question banking etc.;
- tools of evaluation like diagnostic tests, criterion-referenced tests, achievement tests, rating scales, observation schedules, checklists, inventories etc.;
- question banks in various curricular areas;
- detailed schemes of continuous and comprehensive evaluation for every stage of school education;
- detailed schemes of semesterisation at secondary and higher secondary stages of school education;
- modularisation of courses of secondary and higher secondary stages for the purpose of semesterisation;
- teacher education materials on evaluation both for pre-service and in-service programmes; and
- guidelines for schools and boards for implementing various reforms.

Capacity Building

All the functionaries involved in the implementation of the proposed reforms, right from the managers to teachers, will need capacity building interventions. These programmes will have to be tailor made in view of the specific requirements of different target groups.

All out efforts shall have to be made to mobilise all the possible and probable resources available at any level — national, state, district, institutional or even individual — for the implementation of the proposed reforms.

The Role of Different Agencies

The various agencies responsible for qualitative improvement in school education, both at the national and the state levels, have to work hand-in-hand to bring about reforms in the evaluation system.

School

In any venture of educational reform schools play the most crucial role because they are the agencies that transact curriculum and deal with the growth of the learners directly. Therefore, each school will have to develop its own scheme and strategy of evaluation for Classes I to XII which will include the frequency of assignments, tests and examinations, the specific cognitive and non-cognitive areas to be covered, the types of tests to be employed for assessing both the kinds of learning outcomes, maintenance of records and reporting of results. The schools will also develop remediation materials in order to upgrade teaching and learning in the classrooms and encourage teachers to take up action research with a view to improving upon the evaluation procedures. These activities will have to be taken up either individually or collectively by forming school clusters in order to sustain the best of their human and physical resources.

Boards of School Education

The objective of state boards of education in promoting reforms in evaluation will be to improve not only the reliability, validity and management of their own examinations but also the quality of school evaluation in general. Besides, the boards would also have to accept the responsibility of validating educational objectives and identifying hard spots of learning by undertaking performance analysis of the examination results.

Since the boards have the expertise which may not be available with the individual schools for preparing quality test material, they

may develop prototypes and make them available to schools. They will have to organise teachers' orientation programmes in educational evaluation with a view to building capabilities at the school level. The boards must also conduct research in the area of educational evaluation, carry out achievement surveys to obtain census-like data and make their results available to individual schools so as to make them realise their strengths and weaknesses.

State Level Agencies

State agencies like Directorates of Education, State Councils of Educational Research and Training , DIETs and voluntary agencies will have to shoulder the responsibility of assisting and guiding schools in developing and selecting appropriate instructional materials and selecting suitable transactional strategies with a view to realising the educational objectives. Besides, they must also help schools develop tests which can be used for assessing cognitive and non-cognitive learning outcomes and organise regular in-service training programmes for their teachers. They also have to provide to schools the logistics for maintaining students' records, conducting achievement surveys, undertaking innovations, conducting research besides monitoring the progress of individual schools and providing them necessary feedback and guidelines.

Teacher Education Institutions

The institutions responsible for imparting pre-service teacher education in the country can play a vital role in bringing about reform in evaluation practices. For this, they will have to make evaluation a core component in their curricula and review the existing ones thoroughly. Apart from undertaking research they will also have to conduct in-service teacher orientation programmes in evaluation for the teachers belonging to the schools in their vicinity.

National Agencies

National agencies like the National Council of Educational Research and Training, the proposed National Evaluation Organisation and the Council of Boards of School Education need to undertake the task of:

- laying down the expected levels of attainment in each curricular

area of all the stages of school education;

- developing conceptual materials and prototypes on child-centred, activity oriented and competency based teaching-learning materials;
- generating various kinds of tests, which could be meaningfully employed for assessing cognitive and non-cognitive learning outcomes, and making them available to the state agencies;
- conducting orientation programmes for key resource persons;
- organising training programmes for paper setters of different boards;
- inventing and suggesting logistics of maintaining records and reporting of results;
- conducting research for finding out better ways and means for evaluating learning outcomes;
- conducting achievement surveys for obtaining census-like data; and
- dissemination of information.

5.8 Guidance and Counselling

Diversification in terms of streams and sub-streams offers a wide range of options for students at the higher secondary stage. Likewise, semester-length self-contained courses further add to the range and variety of these choices. This calls for effective counselling and guidance services for the benefit of the adolescent students who are to be helped to select streams, courses and units in such a way that they conform to their psychological needs, attitudes, abilities and aptitudes. To discharge this duty, the school shall have to provide specialised guidance and counselling services to the students at this crucial stage of education.

Ideally each higher secondary school is to be provided with a qualified counsellor. However, it is absolutely desirable to provide at least one visiting school counsellor for a cluster of three to four secondary and higher secondary schools. In course of time, a career teacher for each secondary school will also have to be provided.

A guidance cell needs to be set up in each of the SCERTs to provide technical support to schools. Its functions would be two fold, namely, development of materials and provision of training facilities.

The minimum that a school can do right now is to familiarise its teachers in preparing students' profiles in terms of their personality traits, interests and capabilities on the basis of the school record of internal assessment and semester course grades. They also have to be familiar with employment opportunities available for different vocational courses provided in the school.

5.9 Institutional and Organisational Reforms and Instrument of Intervention

Implementation and sustenance of educational reforms in India hinge primarily on:

- the availability of the financial, human and material resources;
- the appropriateness and the adequacy of the mechanisms for supervising, monitoring and evaluating changes; and
- suitable strategies designed for taking care of both these aspects.

5.9.1 Networking of Institutions and Organisations

Qualitative improvement in school education requires stronger intra- and inter-sectoral links among the institutions and organisations responsible for human resource development at different levels — national, state, district and local (village/city). A mechanism needs to be evolved for the smooth and effective functioning of the education system through this network. Delegation of responsibilities with accountability at all levels and setting clear cut goals may help in minimising bureaucratic procedures. It would, however, mean training and orientation of the personnel involved in this process at all levels for clarity in ideas and action. Taskforces may be set up at the state, district and local levels having co-ordination among themselves with regard to their objectives and working modalities. These taskforces may comprise the representatives of the government, the schools and the community having autonomy with regard to their functioning.

Though they may have a fixed tenure of 3 to 5 years, there shall have to be some continuity in the formation of the groups so that at a given point of time all members are not replaced simultaneously.

These taskforces should be responsible for:

(i) identifying and assessing in a periodic manner the basic infrastructural needs of the schools in the area;

(ii) making plans and strategies for augmenting the essential resources both physical and human as well as optimum utilisation of the resources both for equity and quality, e.g., sharing resources available in the community such as using local libraries, collecting and distributing used textbooks and reading materials for those who cannot buy them on their own and procuring voluntary contribution from the community — money and professional service;

(iii) suggesting suitable intervention strategies for handling problems of special nature;

(iv) supervising and monitoring the implementation process;

(v) evaluating the changes and reformulating strategies, if required in view of the experiences gained; and

(vi) acting as an interface between the government and the community.

5.9.2 Provision for the Minimum Essential Facilities

The government at the centre and the state levels will have to make adequate provision for the minimum essential facilities required for effective transaction of the curriculum in all the schools and alternative schooling centres. At present there is a serious move to allocate at least 6% of the GDP to education sector in the country. The requirements of the learners with special needs as well as other challenged groups will have to be kept in view for including them in the mainstreams. It is essential to ensure that all schools have the basic inputs for teaching-learning, i.e., school building with classrooms, drinking water and toilet facilities, teachers, instructional materials and teaching aids. In this task, specific and time-bound strategies must be worked out with the help of all the stake holders

in the community for resolving critical and perpetual problems, e.g., inadequate number of sanctioned posts, delay in filling up of the sanctioned posts, engaging teachers in other governmental duties causing time loss in teaching hours, non-adherence to a minimum number of school days and lack of funds for the purchase and maintenance of certain basic teaching materials. The government alone may not be able to provide all that is required by schools and hence partnerships in improving the school environment for enhancing quality of education will have to be forged.

The growing numbers of non-government schools have increased the disparity between the facilities enjoyed by different sets of schools, government schools and non-government schools. Serious thinking is required to generate resources for the augmentation of facilities in the government schools in general and those located in rural areas in particular.

A common scheme of studies in principle has been agreed upon, but in practice several areas are being neglected in majority of schools. The reason being given for this neglect is the non-availability of essential facilities for these courses, e.g., lack of laboratories, subject rooms, equipments, instruments, and basic reference materials. Transaction of the curriculum in many areas such as science and social sciences especially geography, language and art education suffers on this account. As a result, an unwritten diversification of courses takes place. Resource support is, therefore, necessary not only for quality but for equity as well.

The local educational authorities and the community need to ensure the threshold facilities and arrangements required for teaching of all subjects with due emphasis under the common scheme of studies upto the secondary stage. Recruitment of trained subject teachers rather than generalists from the first year of the upper primary stage ought to be followed strictly.

At the higher secondary stage, keeping in view the requirements of the academic and vocational streams of education, necessary provisions will have to be made. Library, laboratory, workshops, playground, assembly hall, certain subject rooms, adequate number of classrooms, equipment and instruments must be given to all the

schools. Over and above, trained, qualified and competent subject teachers should be recruited for effective teaching-learning.

Idealistic policy perceptions and the uncouth realities of implementation must converge and rest on pillars firmly rooted in indigenous thought, pragmatic vision and unshakable commitment. A complete overhaul of the management systems and not just cosmetic touches is the key to the transformation of the existing school education into a dynamic, responsive and fructifying support system for the process of teaching and learning. Only then, would it celebrate childhood and respect the innocence, curiosity and creativity of every child. The infinite treasure within every learner would be discovered and nurtured to spread its bounty all around.