TO EDUSAT

Paper based on **Prof. Ravindra H. Dave's** talk and interactions
at
DECU
during April and July 2003

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Prof. Ravindra H Dave, *an eminent educationist, retired as Director of UNESCO's International Institute for Education in Germany and contributed to various research programmes and advanced-level training throughout the world. In India, he held higher level posts in reputed organisations like National Council for Education, Training and Research (NCERT) and has provided consultancy to international agencies such as UNDP, UNICEF and the World Bank as well as Government of India and many state governments. After his retirement, he renders honorary service in many countries in the education sector. He has authored and co-authored about 35 books and over 100 professional papers.*

An Approach to EduSat

The Government of India and Indian Space Research Organisation (ISRO) plans to launch a satellite dedicated exclusively for educational purposes. As a preparatory process several talks and discussions are being held with eminent educationists, academicians, educational administrators, media developers and others in order to get a wide and holistic perception of what is the existing educational scenario and what will be the demands from EduSat. In this context, DECU/ISRO took the opportunity of consulting an eminent educationist Prof. Ravindra Dave who was visiting India. The following paper is based on Prof. Dave's talk and interactions at DECU during April and July 2003.

Backdrop

For any nation, level and quality of education is one of the most significant parameters for development. In India, the total literacy has gone up over the years but the quality remains dubious. Education is not just the ability to read and write but a complete process of human transformation and there are many miles to go to achieve the desired quantity and quality.

Indian education system at present is somewhat lopsided due to various reasons: inadequate importance given to systematic planning, insufficient fund allocation, delayed implementation, inconsistent implementation methods, unrealistic programmes and schemes, societal constraints and many more. It is often fragmentary and not holistic. Our national education policies so far have not been fully effective to fulfil the constitutional resolve of education for all coupled with equity and social justice. Some of the major challenges in education are, for example: high dropout rates at the lower primary and upper primary levels and lack of correlation between education and employment at the secondary and higher secondary levels as well as at the University stage. One of the major objectives of education should be to increase the **Cognitive Capital of the Country**. This should be integrated with **Value Orientation and Life Skills**, and thus augment the potentiality of all persons to achieve economic, social, cultural and ethical advancement.

Satellite-based Educational Programme (SEP)

In such a scenario, the Indian Space Research Organisation (ISRO) has proposed to launch EduSat, a satellite entirely dedicated to education. Satellite technology with possibilities of various technological combinations and ability to cover a large area can be extremely helpful to meet the challenges of the educational sector. Thus, EduSat as a support and enrichment system has the capacity to enhance the **Quality and Extensity** of education in India.

It can take care of the learning needs of students in the formal system as well as people outside the formal structure of education including the dropouts, unenrolled persons and special groups viz. farmers, artisans, artists, fishermen, health workers, rural community workers, home-makers and senior citizens, who need exposure to the current trends and new developments, which have a direct or indirect impact on their lives. While encompassing a large number of people through SEP, formation of homogeneous groups will help in targeting them with relevant information and education in an interesting way. Thus, SEP will seek to adopt all formal, nonformal and informal modalities of learning and enhancing the quality of life for all.

Many technological possibilities including different modes of interactivity have been considered for SEP. Application of these different modes being a vital task, will require a thorough planning and meticulous preparation. The prime step would be to examine and diagnose the prevalent situation in the process of learning and growth at both macro and micro levels and *build the edifice of SEP for future development.*

What Can Make SEP a Successful Programme?

SEP can become a programme for enhancing the empowerment and enlightenment of as many more people of India as possible and of all ages by adopting a success-oriented

planning, implementation and monitoring approach. This requires clarity of concepts as well as refinement and redefinition of several aspects of education in terms of what to learn, how to learn it and also ***'learning-how-to-learn'*** throughout life. Here is an attempt to elucidate some of them:

☞ The synergy between education and learning has to be well perceived and operationalised. Education is essentially an aid to generate worthwhile learning, while learning itself is ultimately an individualised and lifelong process, whereby human transformation occurs within the individual. Learning has various forms such as: pre-learning, reinforcement of learning, classroom learning, individualised and independent learning of small groups or large masses, enrichment learning, self-learning and self-directed or self-managed learning. The process of learning can be made effective through various sources and mechanisms of guidance such as classroom teachers, SEP programmes and distance learning modes, audio-visual as well as other multi-sensory aids and a variety of appropriate transactional methods.

☞ Due emphasis should be given not only to the learning of content, but also to the **Enhancement of Educability**. Educability is a basic natural human capacity to learn, which is implicit in a new educational focus called **learning-how-to-learn**. Holistic education should work systematically towards enhancement of**Educability or Learnability**. Learning is natural and spontaneous with human beings. This has to be enhanced systematically and effectively through important programmes like SEP by sensitising the learner to different techniques and modalities. For example, one should learn to read the textual material of a subject like mathematics slowly, i.e. with reduced pace, but read most items of a newspaper very swiftly. This can happen when the educability of the individual is enhanced. EduSat has the potentiality to make the most significant contribution in such newer aspects of learning and development using latest technology and thus taking Indian education into the 21st century.

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In a comprehensive sense, education can be conceptualised as a 'multi-dimensional matrix of learning through formal, nonformal and informal modalities, addressing the changing needs of all age-groups treating learning progression as a lifelong process and contributing to all major dimensions of human development'. This can be described in a two dimensional grid with a number of cells representing other dimensions of the matrix.

Life Span / Dimensions of Human Development	Age-group					
	Innocent Infancy	Charming Childhood	Turbulent Teenage	Youth and Young Adults	Middle Aged	Senior Citizens
	1	2	3	4	5	6
1. Physical						
2. Intellectual / Mental						
3. Social						
4. Economic						
5. Civic						
6. Cultural						
7. Ethical						
8. Spiritual						

☞ : Further, the major dimensions of human development enlisted : in the matrix should be woven in EduSat Programme packages.

Dimensions	Illustrative Curricular Elements for Programme Packages
1. **Physical**	- Health habits, sanitation, health related food, exercise, yoga, rest, etc.
2. **Intellectual/ Mental**	- Components of cognitive development such as knowledge of different subject areas, understanding, power of analysis and application, critical thinking, creative thinking, problem solving, yoga.
3. **Social**	- Learning pertaining to the family constellation, neighbourhood, local community, larger society, national and international relationships, social peace, conflict resolution through dialogue, collective welfare and progress.
4. **Economic**	- Vocational development, occupational education, science and technology, economic growth, wage employment, self-employment, alleviation of poverty, economic interdependence at the local, national and global levels.
5. **Civic**	- Inculcation of attitudes, understanding and skills pertaining to participation in local governments such as gram panchayat and municipal corporations, state governments, national government, functioning of parliament, constitution, citizenship rights and responsibilities, human rights, global citizenship, civil society.
6. **Cultural**	- Music (Sangeetkala), Drama (Natyakala), Dance (Nrityakala), Sculpture (Shilpkala), Architecture (Sthapatyakala), Literature (Sahitya), ancient languages like Sanskrit, similar examples of ancient as well as modern cultural developments such as computerised art.
7. **Ethical**	- Industriousness, work ethic, co-operation, consideration of others, empathy, sharing and charity, tolerance and mutual respect, cultural pluralism and inclusiveness, basic human values, honesty and integrity, truth, non-violence and selfless service, elimination of anti-values such as inherent prejudice, hatred and vengeance,.
8. **Spiritual**	- Intrapersonal development such as achievement of internal purity, mental peace, internal strength (Aantarik shakti), blissfulness (Aantarik anand), understanding and development of consciousness including universal consciousness.

☞ For nonformal programmes of education, need-based groups related to different occupations, age range, demography and background educational levels may have to be identified. These programmes may be based on individualised learning or learning in small or large groups.

☞ In the modern educational developments, it is necessary to capture rapidly growing knowledge and skills in Science, Technology and other fields. This phenomenon calls for ensuring the relevance of learning from time to time. Thus, SEP will be called upon to focus not only on **Quality**, but also on **Relevance and Functionality** of learning for different age groups and for different dimensions of human development. SEP programmes should therefore endeavour to build Relevance and Functionality besides quality and extensity.

☞ One of the programmes, especially for the formal education sector, can be titled as **'Readiness Learning'**. This is conspicuous by its absence in most educational institutions at present. Readiness Learning is important both for providing insight and enhancing motivation among learners. In the beginning of an academic session, children of say class seven or eight do not know what is to be studied in the course of the coming year and hence they are often driven like dumb sheep. They should be given some generic understanding right in the beginning of the academic year as to what is it that we are going to learn and grow under different curricular areas of that year and thus increasing their awareness and interest in learning. They should also be helped in revising pertinent elements of past learning and taking them to the level of mastery in the beginning of the year, so that they are enabled to make optimum progress in the new learning to be acquired in the immediate future in the name of an academic year. This type of a well-designed educational transaction at the commencement of a year or even a semester is called **Readiness Learning**. The term **Readiness** implies psychological, academic and motivational readiness for new learning.

SEP has the possibility of promoting this valuable support programme of Readiness Learning say from class five onwards when the children are grown up enough to have meaningful understanding of future learning and growth from year to year and can become enlightened participants in the entire process of education. The learners will thus be enabled to consult their textbooks more meaningfully. Some learners may carry out pre-learning on their own and may even transmit some generic ideas about future learning to their parents in order to get support at home.

☞ The development of software and treatment of curricular objectives and content should be such that they stimulate the learner for further learning and development.

☞ Even though SEP has the potential to reach the learner directly, many programmes of formal and nonformal education will call for the help and intervention of teachers and principals. Their professional competence will play an important role. However, experience has shown that only professional competence is not adequate. Together with competence, there is a great need to build professional commitment so that competence becomes functional and operational in a consistent manner. Teachers' commitment to the growth and development of learners, commitment to society, commitment for excellence and commitment to basic human values are essential ingredients for making educational programmes including SEP adequately successful. SEP should therefore endeavour to develop support programmes for both pre-service and in-service education of teachers for enhancing different professional competencies among teachers and principals and also inculcating professional commitment as indicated here.

☞ Utilising modular and other approaches a major programme for enhancing the competence and commitment of teachers should be developed as an important component of SEP. Teacher education for formal and nonformal sectors, when carried out as stated above, would have a great impact and a considerable multiplier effect. These facets together would give momentum to this widespread educational campaign.

☞ Vocational education is yet another field to be considered for SEP together with a variety of fields of general education. In recent times certain subjects like computer education and entrepreneurship, cut across both general and vocational studies. EduSat will consider such interaction between the general and vocational studies as an asset for the broader concepts of vocational development, employability and wage-employment. Education for vocational development would be considered under the following four stages of learning:

a. Vocational awareness and orientation - mainly for the primary stage.

b. Vocational exploration - chiefly for upper primary and lower primary stage. (The vocational orientation programmes started at the lower primary stage, would not be terminated, but also continued at the upper primary and secondary stage and would be integrated with the stage of vocational exploration).

c. Vocational training - for secondary and higher secondary level of learning organised in general schools or separate vocational schools or ITIs and other such technical training institutions. This may be for the semi-skilled workers and highly specialised personnel in various professional and technical fields.

d. Vocational retraining leading to updating and modernisation of professional knowledge and skills from time to time. This will be a part of the lifelong learning under the field of vocational and professional development.

In the initial phase of EduSat programme, the first two stages of vocational development viz. vocational orientation and vocational exploration, will be the major focus. In subsequent stages, EduSat will attempt to other stages as well at least in those vocational areas where a satellite-based educational support system is feasible.

☞ Adoption of technology will have to be flexible i.e. it will have to be adapted to the requirements of target groups and be easily accessible to them.

☞ All programme packages should have an harmonious integration of learning and joy of achievement, etc. and should not be dull and dry with an overloading of content. The treatment should be innovative and non-conventional on the one hand and appropriate to the groups targeted to hold their span of attention on the other.

☞ For EduSat to succeed, a multi-phased planning in minute details and action points involving all personnel ranging from technical, research and production fields, to scientists, subject experts, content organisers, and consultants is urgently required in order to meet the current time targets. As an important component of this plan some alternative arrangements to act as buffers will have to be kept for realistic implementation of the task.

Approach to Curriculum

While designing the curriculum for EduSat, the existing pre scribed curricula will be given full attention. At the same time some new developments, which have recently started influencing our personal, social and economic life, such as: Information and Communication Technology, Biotechnology, Space Technology, Laser Technology, Robotics, Health-related Science and Technology, new issues concerning Water and Sanitation for enhancing life expectancy, entrepreneurship for economic development, self-employment strategies and such other, will also be given adequate attention. Likewise, those cultural elements providing a rich heritage to every Indian and which are necessary to foster peace, harmony, mutual respect and genuine progress as well as prosperity will also be taken into account.

Thus, the curriculum will be holistic having three major components-

1. Regular Areas of Learning (RAL)
2. Frontline Areas of Learning (FAL)
3. Cultural Areas of Learning (CAL)

Regular Areas of Learning (RAL) include all subjects and themes prescribed by the governmental and other authorities for elementary, secondary and higher secondary education and also vocational and higher educational sectors. This is basically the formal system of education provided through the schools and colleges and other specialised institutions. SEP will work in a variety of ways to provide support and strength to these Regular Areas of Learning.

Frontline Areas of Learning (FAL) are the newly emerging areas of knowledge, skills and technologies. They include a variety of subjects and themes being developed recently in the fields like science, technology, economics, archaeology, etc. and are becoming increasingly more relevant for socio-economic and cultural development of every society. The exposure of different categories of learners to different frontline developments is essential to be incorporated into a holistic and functional curriculum. Taking into account the entry skills of the target groups, some of the FAL will remain at the introductory and rudimentary level whereas a few others will be treated at a more in-depth and technical level. A few examples of frontline areas are: Information Technology (IT/ICT), Biotechnology (including fields like pharmacy, medicine, agriculture, bio-industry, genomics, cloning, genetically modified foods, etc.), Space Technology (as well as related organisations and projects such as ISRO, PRL, NASA and International Space Station), Robotics, Aviation Technology and others together with entrepreneurship in economics and vocational development. As, in the coming years, most of the youth will have to rely on self-employment, developing risk taking attitudes and innovativeness among them is inevitable. Inducting topics of entrepreneurship in the curriculum will open up new avenues for tackling the problem of unemployment in the near future. Thus, recent most developments in science, technology and other fields, which are often not absorbed in the existing curriculum and which

inevitably take a long time to do so, will be offered as Frontline Areas of Learning at appropriate levels of sophistication making them interesting and functional, so that learners in India have the opportunity to remain in the forefront of new national and global developments. That is why the nomenclature - Frontline Areas of Learning as an important curricular component.

Cultural Areas of Learning (CAL) takes care of our Indian cultural heritage and the quality of personal and social life. It has however been observed that this rare treasure constituting a rich civilisation is not given adequate place in the existing curriculum and needs further strengthening for the benefit of the country and the world as a whole to achieve holistic progress, prosperity and future development. For example, the Indian system of Ayurveda is not developed only for the human beings but also for other living beings and the vegetative kingdom. This unique feature, which may be described as 'Manav Ayurveda', 'Pashu Ayurveda' and 'Vanaspati Ayurveda', needs to be highlighted and put across to the whole humanity, Indians and others alike to indicate concern of human beings for all other living beings and even the vegetative kingdom, depicting a shining example of unity in diversity.

There are several examples of developments in astronomy, yoga, and mathematics as well as the Indian heritage of music, dance/nritya, drama, sculpture and architecture. Also, Sanskrit is a unique component of culture, which is an ancient language on the one hand and a rare treasure of cultural, ethical, spiritual and linguistic characteristics on the other. It is not surprising that Sanskrit has been recently found by Western specialists in computers and Internet to be the most conducive language for computers. Several discoveries in physics, chemistry, botany and zoology took place in India from ancient times onwards besides mathematics and astronomy. Discovery of zero, precise prediction of eclipses, weather forecast, diagnosis and treatment of psychosomatic diseases through therapeutic yoga are just a few specific examples.

EduSat should become an instrument for cultural enlightenment for our nation covering ancient, medieval and modern periods depicting cultural diversity and pluralism on the one hand and basic human unity and non-duality on the other. The ancient

dictum of 'Vasudhaiva Kutumbakam' and the conditionality to promote a dialogue within the country and across nations throughout the world, around the concept of the world as one single human family, as it is relevant to achieve peace and prosperity in modern times, is yet another example under the Cultural Areas of Learning. This is not at all a revivalistic approach resting on past glory, but internalisation of our glorious past to integrate it with the contemporary developments in Frontline Areas of Learning in order to ensure a better and higher quality of life in the 21st century for as many more citizens of India as possible, through the intervention of EduSat among other educational endeavours.

Action Plan

A few items of Action Plan are suggested to start the process. They are not necessarily given in any particular sequence, but are listed as reminders to see that they are included when a comprehensive and multi-dimensional plan of decision-making, material production, technological details, implementation, monitoring and impact evaluation is charted out.

- Identifying critical elements
- Preparation of materials based on the dimensions of human development considering them as interrelated and Interactive
- Time schedule with action items and deadlines
- Preparation of pilot programmes/episodes
- Pilot testing of programmes
- Modifications if any and finalisation
- Outlining the overall strategy before the launch of EduSat
- A work schedule for continuity after the launch of EduSat
- Monitoring the pace, quality, relevance, integration etc. through research
- Training adequate numbers of personnel in research, production, engineering and management

Needless to say, that a methodical approach and utmost care, coupled with user-friendly technology would go a long way in making the programme a success. ■