

DEPARTMENT OF SCIENCE & TECHNOLOGY

**An Outlook for India's Future
(2000 A.D.)**

INTERIM REPORT

on

EDUCATION

by

Dr. S. C. SETH

NCST PANEL ON FUTUROLOGY

PREFACE

The Indian educational system has been put to periodic scrutiny several times during the last 100 years since the beginnings of what can be called the modern education. A number of commissions were appointed by the Government from time to time to survey Indian education notable being the Indian Education Commission, 1882, the Commission of 1902, the Sadler Commission of 1917, the Radhakrishnan Commission of 1948, the Lakshmanswami Mudaliar Commission of 1952 and the Kothari Education Commission of 1964. To this one could add, for sheer historical considerations, numerous Despatches starting with Wood's Despatch of 1854, a series of Committees such as, the Hartog Committee of 1929, the Sapru Committee of 1934 and numerous reports such as, the Abbot-Wood Report of 1936-37, the Sargent Report of 1944 right up to J.P. Nayak's 'Charter' of 1975. The periodic deliberations of Central Advisory Board of Education offer yet another current review of the educational system in our own times.

Curiously enough, in all these surveys three common characteristics are visible :-

- (1) They have all expressed dissatisfaction with the prevailing educational system;
- (2) They have all pleaded for speedy educational reforms; and
- (3) They have all shown concern for future.

contd...

The First Commission of the Independent India which was specifically asked to go into the changes necessary in the University education, observed, "The marked deterioration of standards in teaching and examinations and increasing dissatisfaction with the conduct of university administration and elections to university authorities are matters of great concern. The universities as the makers of the future cannot persist in the old patterns however valid they may have been in their own day. With the increasing complexity of society and its shifting pattern, universities have to change their objectives and methods, if they are to function effectively in our national life. A policy of drift in the vague hope that, if the universities are granted full autonomy and are permitted to pursue their own ends with intelligence and imagination, higher education will take care of itself, will be dangerous. Automatic and spontaneous adjustment will not take us to the future we want. We must develop a comprehensive positive policy within the limits of which there should be ample scope for pioneering and experimentation".

Dr. A. Lakshmanswami Mudaliar's Commission which specifically went into the reform of secondary education in India felt that the educational system should continuously adopt itself to the circumstances and conditions of life of a nation. The Commission in its report observed, "India's needs today are different from what they were in the past. India is now free and independent. The educational needs of a free country are different and ought to be different from what they were under the foreign domination". It added, "In a changing world the problems of education are also likely to be changed.

Likewise in the Kothari Commission report while referring to the changing times, the science-based world, the commitment to development, welfare, progress and security its Chairman Dr. Kothari, observed, "It is characteristic of a world permeated by science that in some essential ways the future shape of things is unpredictable. This emphasizes all the more the need for an educational policy which contains a built-in flexibility so that it can adjust to changing circumstances. It underscores the importance of experimentation and innovation. If I may say so, the single most important thing needed now is to get out of the rigidity of the present system. In the rapidly changing world of today, one thing is certain: yesterday's educational system will not meet today's,

and even less so, the need of tomorrow". He further added, our report, only offers, "the first step towards bringing about what may be called an educational revolution in the country".

When the Constitution makers of India, amongst other things, gave their vision of a preferred future, they specifically gave a 'directive' for a state of affairs where free and compulsory education is available for children upto the age of 14. At that time there were less than 50 million children in this age-group. Today, there are over 70 million children in this age-group and we have not yet been able to realise this dream of the Constitution makers. There will be around 120 million children in this age-group by the year 2000 A.D. Are we ready to meet their educational needs?

The dilemma of India is the dilemma of managing a 'large human system' be it for education or for any other human need. Will the conventional means offer a solution to our problems? A rough estimate indicates that following conventional methods we need to open a school every tenth minute for 250 pupil in order to meet the current needs of the children within the age-group 6 to 14. It would also require mobilisation of 1 per cent of India's current population as primary school

teachers. Do we then have the resource and the management capability to attain this goal? As things stand today, we don't seem to have enough resource to fulfil even the minimum goal of attaining 100 per cent literacy.

It is more than clear that we have to take recourse to non-conventional methods. The entire exercise of human resource development (608 million today and 960 million, plus or minus persons by the year 2000 A.D.) is some responsibility. The advantages available because of science and technology and of other modern sophistications that India can today muster, coupled with a certain degree of human dedication, can certainly help us a lot to usher India into a "learning" society which is the hall-mark of the post-industrial society. Is the nation prepared for such a dynamic leap? These and others are some of the basic questions to which the Technical Sub-Group on Education had applied its mind. In addition, it has looked at the basic educational needs of the children, the youth, the special Group like the women, etc., looking for such practical and meaningful solutions whereby on the one hand our educational system may shoulder the task of human resource development and promote rationality and creativity on the other.

....contd.

This Interim Report recaptures a variety of the familiar and new points presented by members of the Technical Sub-Group in the two rounds of sessions that this Group had had during the year 1975-76. Some of these ideas were subsequently test-checked by me at the seminars specifically organised at SNDT Women's University, Bombay, IIT Bombay, IIT Madras, University of Madurai and several person to person discussions with all those who happen to be the leading figures concerned with educational change and reform in India - too many to be named here.

This report presents two scenarios - the trend scenario which, if modified, does envisage a state of affair where "appropriate education" shall constitute massive introduction of non-formal education. It should take precedent over the existing formal system. No one denies the fact that educational processes should primarily be committed to attain 'excellence'. But a formal system has embedded in it "time" element and a "cost" element. If such a system creates conditions that fruits of education should be out of reach of the 85 per cent of India's population, one may gently ask for whose benefit and pleasure all this 'formality-for-excellence' - really is?

contd.....

The preferred scenario presented here gives a 21 Point Programme of an "accelerated implementation scenario" on which action should commence today. If we are committed to a socialistic society, we are perhaps obliged to have a judicious mix of setting up Centres of Excellence and higher knowledge along with a host of creative, unstructured and innovative experiments to educate millions of Indian citizens. This interim report does not so much offer solutions as it tries to ask: What should then constitute such a creative, experimental, innovative and futuristic system of Indian education? Sooner we find our answers better would it be in the national interest. Inspired with some such commitment for the future and with a humility that the enormity of our problems devolves on all of us I submit this Interim Report for further consideration, discussion, debate and, if possible, for quick and speedy implementation today of some of the recommendations made here.

New Delhi,
Oct. 1, 1976.

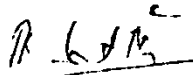

(S.C. Seth)
Member-Secretary
Futurology Panel
Convenor, Technical Sub-
Group on Education.

TABLE OF CONTENT

	<u>Page</u>
PREFACE	(i) - (vii)
I. ASPECTS OF FUTURISTIC PROJECTIONS ..	1
II. THE KEY EDUCATIONAL ISSUES ..	2
III. <u>TWO SCENARIOS</u>	
A. <u>THE TREND SCENARIO: OUTLINE OF APPROPRIATE EDUCATION</u> ..	5
(i) Short-Duration Courses: ..	6
(ii) Mode & Content of Education. ..	7
(iii) New Technology of Education. ..	8
(iv) Societal Values and Evaluation..	8
(v) New Pedagogic Norms ..	9
(vi) Appropriate education needs 10% of G.N.P.	9
B. <u>EDUCATION 2000 A.D. .. ACCELERATED IMPLEMENTATION SCENARIO OF A PREFERRED FUTURE:</u>	10
IV. TWENTYONE POINTS	12
V. CONCLUSION	13
VI. APPENDIX 'A'	14
Table 1.1: Literacy and Illiteracy.. 1901 -1971	15
Table 1.2: Education: Number of Schools & Enrolment: 1950-51 to 1974-75.	16
Table 1.3: Expenditure on Education: 1960-61 to 1974-75. ..	17
Table 1.4: Outturn of Science Graduates & Post- Graduates:1963-64 to 1968-69.	18
VII. APPENDIX 'B': List of Members of the Tech. Sub-Group on Education.	20

.....

EDUCATION : A FUTURISTIC VIEW

By

Dr. S. C. Seth

Any attempt towards futuristic projections in the field of education can take its cue from the developmental needs of the nation.

The basic question to be asked are : Is education for knowledge and skills? Or, is it for employment? Or is it for societal transformation?

The population profile of India also gives a direction what this scenario would look like. We are today 600 million people. Present status of literacy is only 29% of the total population. There were 1.8 million educated job seekers in the year 1970; they rose to 2.3 million in 1971; and about 3.3 million in 1972 signifying a percentage rise to 26 to 43 respectively. The cost of generating employment for educated people is equally staggering. For instance, the schemes for educated unemployed initiated in 1971-72 and continued through 1972-73 expected to create an additional employment opportunity only for 65,000 people. In addition the scheme to generate self-employment opportunities for 500,000 people which was introduced by the Planning Commission and got implemented between April 1973 and March 1974 was to cost around Rs.1000 million. The special programmes launched in the States and Union Territories during 1972-73, at a total cost Rs.270 million were expected to generate employment for about 3.7 million people.

....contd.

of whom 11,000 were to be engineers. The key question is how and what cost do we generate employment for the mounting population of India and what constitutes "Appropriate Education" to undertake the vast exercise of Human resource development - between 1975 & 2000 A.D?

(ii)

If by the year 2000 A.D. India's population is likely to be around 960 million people even on a conservative estimate one can say that at least 500 million people would constitute a group of such able bodied citizens who can be gainfully employed. Such an employment prospect necessitate availability of a varying degree of educational experience. We have thus to ask ourselves what this education would costus? And, will the current educational system meet the needs of the Future? Here we can also ask the following few additional questions :-

1. What should be the educational system to meet the needs of the future? The present educational systems does not produce man-power which society can readily absorb. Nor does it help turn existing population into active man-power as a national resource. How should we make education an instrument of turning India's population into a resource?

contd.....

1. Today, our emphasis is on formal training, learning by rote and production of theoretical papers. Is not today's educational system unrelated to life and society? Even scientists only work to see their names in Western journals. Is not the current Indian educational system, as seen, in terms of its syllabus, programme content, evaluation and graduating yardsticks such that needs be altered? Should we not have instead a programme content which includes part study-part work? (Chinese have tried it with success).
3. Should our evaluation or the graduation yardstick be merely one that judges the memorising skill? Should we not give due recognition to those who contribute to the production process in the country - be it at the cottage industry or be it in the field of sophisticated industries? Also, therefore, don't our teaching techniques need to be changed? If so, in what direction?
4. Does not the paramount need to make optimal use of the existing set-up inter-alia poses the question if the higher education should be frozen for the next five years? Is it not a debatable matter if - considering the global disenchantment with higher education - there should be no expansion in the existing infrastructure in this field?

contd....

5. Is not there a need to undertake a cost benefit analysis, how much it costs the nation to turnout a graduate of different types: medical, engineering, general and so on: and what the nation in turn benefits from them?
6. There is also a need to re-evaluate the existing norms and value systems which have given birth to certain false values and equally inappropriate life styles unsuitable to a country where, less than one-third of our population lives in urban areas and the majority lives in the rural area, If it is true that our educational system upholds the urban life-style and caters preponderantly to the needs of urban-elite alone, should it not then be altered? Do we need to act in reverse? Should we develop an educational system which make working in rural areas more attractive. Should not education help solve the twin problems of India - mass unemployment and mass migration of rural population to the cities?
7. Finally, can it be suggested that there should be a total ban on school buildings and expansion thereof? Should we not instead make optimal use of the existing buildings? Can't we educate young people upto 11 p.m. in the night in a shift system. Besides, is not the class-room

... contd...

technique expensive ? Should we not combine it with the satellite communication educational programmes at appropriate levels of education? Given an ideal combination of hard-ware (satellite) and the soft-ware (Educational films etc.), in the long run would it not be less expensive a way of coping with the demand of educating an expanding population (600 million today - 960 million in 2000 A.D)?

8. Also, do we not need to tag all units of production with one educational institution or the other e.g. Cottage industry with functional literacy centres - industry with technological institutions?
9. Finally, 'the goals of future education, 'is it not right to assume, should have a great deal in common with the 'National developmental goals.' Today, is there not a contradiction visible between the educational goals and the developmental goals?

(iii)

TWO SCENARIOS

A. The trend Scenario: Outline of Appropriate Education. If the educational developments in India continue as they are then by the year 2000 A.D.

..... contd.

this system, which is elitist in character, if corrected, will perhaps lean towards short duration vocational courses and non-formal education. These are clear cut trends which indicate how educational system can be made appropriate to the needs of a 'large human system'. The case for these changes can be discussed as follows :-

Short-Duration Courses:

The definition of appropriate education would lie in the cumulative and comprehensive answers to the above questions. If we are to educate our masses, make them literate, impart them a variety of skills - and if we need a body of trained workers be they teachers, nurses, doctors, apprentices, engineers or scientists - considering that education, hereafter, need to give emphasis on specialised skills then, clearly, we need to take recourse to short courses. The future duration of various courses - which constitute a variety of programmes of formal education - would, one can safely say, consist of not more than two years at the college level education. Of course, we can easily foresee that the people exposed to such short duration courses would be returning for a second or third shot of education later - from their work place, occupation or creative endeavour

..... contd.....

in which they are engaged. We should indeed abandon the idea that short-term courses will dilute the knowledge level. The true measure of knowledge lies in its "appropriateness."

Mode & Content of Education:

As time passes one can easily forecast the emergence of non-formal education in a big way besides the existence of the facility for persons who wish to get educated to enter any curricula at any stage or at any age group. The non-formal system would include 'Performance-oriented-courses', the Open University System as is being practised today in the U.K; the non-school type field education as is prevalent in the U.S.A., the Chinese extension education programme that goes around the clock, and around the year; the educational facilities of the world open university now being operated from the Rapid city, South Dakota USA for correspondence type courses; and several others programmes using Radio and Television relevant to the indigenous need. Some of these programmes may be relevant for rural technology and agriculture or to assist small scale industry or to upgrade individual skills; many such courses will either totally replace the formal education or shall supplement them through extra-curricular science education in schools, colleges and universities. Many of these programmes shall provide opportunities of education to persons who had earlier failed to avail of formal instruction of today.

..... contd.

New Technology of Education:

In this respect one can foresee increased use of Audio-visual techniques, of our national T.V. and radio hook up cheporoned by a ground force to cater to the needs of the children, the primary education, the education of the special groups, such as the specialised training of teachers or of managers or of education relevant to the needs of special social groups such as the handicapped persons or the housewives or the neglected groups such as the hill and tribal folks, the women, and even the nomadic groups.

Societal Values and Evaluation:

One of the most important debate related to our system of education, which has not yet begun on a national plane, lies in the realm of societal value system be it social, economic or pedagogic. Today the place of a person is judged in the society not only on the level of education that he or she has acquired but also on the market economy the price that the employment market offers in terms of the emolument rating. This needs an overall change. A futuristic view suggests that once we reduce our emphasis on formal degrees, which would be the case in the future, we shall not grudge offering adequate place in society, and appropriate employment too, to those who had gone through short duration of courses. It is only through such courses

contd....

and appropriate socio-economic valuation that we would be able to raise, in millions, trained personnel, to participate in the developmental activities of the country.

New Pedagogic Norms

The futuristic view also suggests that in order to achieve what is stipulated above we shall have to evolve different norms of evaluation of our pedagogic standards. The present day craze of our scientists and educationists for recognition by the Western peers would get replaced by an overwhelming respect towards indigenous appraisal. In addition the yardstick of scholarship attainment would probably lie in not so much be based on theoretical or conceptual writings but would be equally measured in terms of the contribution that an individual's work shall make towards fulfilling the societal needs.

Appropriate education needs 10% of G.N.P.

The goals of appropriate education are far too many to be easily enumerated. The challenge of human resource development in India is not merely a wishful dream. It is a must. Indian society faces a severe crisis point in its current inability to train and gainfully employ its teeming millions. A futuristic vision of things to come warrants that much before 2000 A.D. India would be spending not 3% of G.N.P. as is the case of today but 10% of its G.N.P. towards 'appropriate education'. The test of our realism lies in taking action now and here.

contd.....

B. EDUCATION: ACCELERATED IMPLEMENTATION SCENARIO OF A PREFERRED FUTURE:

Arising out of the trend scenario of an appropriate educational system we can also here indicate our preferences.

The concept of a preferred future in any field tends to be subjective. The national need, however, does help to focus attention on certain values, programmes and institutional arrangements which deserve attention and eventual acceptance.

In terms of the national policy, therefore, one can outline an "accelerated" implementation scenario.

Education for the future and education towards the year 2000 A.D., in the Indian context, should aim at certain futuristic targets. The adoption of such targets as an integral part of the Six Five Year Plans that separate the year 1976 from the year 2000 A.D. would influence the course of current decisions in educational planning.

By the year 2000 we shall be around 960 million people. If education is conceived as a life long exercise, then, we would have to aim at establishing an infrastructure for education which could meet the varying types of educational needs of this vast and diverse population. In India today we have created institutions which, to some extent correspond to best in other part of the world. We have our Harvard, our Oxford and our Eton. But the

contd....

experience gained from the functioning of such centres of 'learning' patterned on alien models have introduced gross distortions in our educational system which is reflected in the injustices and inequalities of our present day society. Among the criticisms levelled against the present system are:

- (a) It caters largely to the needs of elitist groups in our society.
- (b) Because of the formal nature of the system, the time element (10+2+3), the cost and the highly selective nature of the preparation required for entry into these institutions renders them beyond the reach of 85 per cent of India's population.
- (c) It suffers from acute 'knowledge obsolescence' which is visible both in the calibre of the majority of the community of teachers and professors as well as in the design of curricula. There is no system by which knowledge updating and knowledge renewal can be ensured.
- (d) It is not geared to suit the real needs of our society. For instance professionals such as, nurses, doctors, engineers, etc., undergo stereotyped learning for four and five year periods at high cost to society and high personal cost in time and money. They are then made to forcibly fit into job situations that do not require such elaborate training. What is being neglected by our present system is the training of middle level professionals who would be available more quickly to society (through short courses, etc.) and who could, if need be, go back to their institutions for further training and acquisition of more sophisticated skills.

If the above premise be correct, then the preferred future for Indian educational system would be one which, amongst other things, should embrace the following few goals:

contd.....

- (1) Achievement of 100 per cent literacy (We will not at this time go into the polemics surrounding the definition of 'Literacy').
- (2) Education to be free upto secondary level; for higher levels and professional education gradual reduction of costs over the years.
- (3) 'Cafeteria' system of education where one has a greater freedom in choosing areas of ones interest and time schedules that do not require rigid sequential stages of school and college ~~attendance~~ attendance with fixed hours in the day time for 'acquiring' knowledge.
- (4) Flexible syllabus and course content to ensure greater creativity and less curricula burden on the pupils.
- (5) Assessment to be made in terms of performance credits and not necessarily written examinations.
- (6) Degrees to be valid over a limited time-frame. To overcome knowledge obsolescence degrees shall have to be 'renewed'.
- (7) Mode of education: "Study-work-study" in all fields with increased emphasis on 'creativity' at all levels.
- (8) Educational content to have relevance to life, society, ethics, socio-economic imperatives and culture.
- (9) Compulsory teaching of history of science, history of civilisation, world geography, international institutions and comparative religion.
- (10) Compulsory work experience in rural development and military training.
- (11) An increasing larger portion of the total outlay for education to be devoted to building the infra-structure and the soft-ware needed for non-formal education.
- (12) Conventional higher educational opportunities to be provided only for highly meritorious students in the normal run; and, specialised training in narrow specialities to be open to one and all.

contd.....

- (13) Technical education to have a much larger 'practical' component.
- (14) Industry to be called upon to bear a share of the cost of technical education since they are the biggest beneficiaries of the products of technical education.
- (15) Delinking of degree requirements from jobs and linking jobs to work experience and work credits.
- (16) Increased use of new educational technologies: Audio-Visual aids, SITE, correspondence courses and open universities.
- (17) Vocational stream to commence from Class VIII onwards.
- (18) Special emphasis on education of interest groups such as: women, handicapped persons, tribal and hill people and nomads, etc.,
- (19) New educational structures: Greater autonomy for academic institutions.
- (20) Increased student participation in determining course content and running of educational administration.
- (21) Gradual emergence of common school system.

CONCLUSION:

In conclusion, an additional emphasis needs to be laid on the fact that all that is necessary to be done should be done to promote egalitarianism, rationalism and creativity through our educational system. We cannot ignore the fact that education does remain that potential instrument which alongwith other factors promotes inequality in society. It should be our hope that over the years this would not be the case.

contd.....

NOTE: We reproduce here the following four tables. These are :-

- 1.1 Literacy and Illiteracy: 1901 - 1971.
- 1.2 Education: Number of Schools and Enrolment: 1950-51 to 1974-75.
- 1.3 Expenditure on Education: 1960-61 to 1974-75.
- 1.4 Outturn of Science Graduates and Post-Graduates: 1963-64 to 1968-69.

These have been taken from the publication entitled "Basic Statistics relating to the Indian Economy, Vol.I: All India" published by Economic Monitoring Service of the Economic Research Bureau (ERB), Bombay. The notes below the tables are supplied by the ERB and edited by Dr. Narotam Shah, then Bureau Chief, Commerce, Member, NCST Futurology Panel's Technical Sub-Group on Energy. Dr. Shah is presently Director of Centre for Monitoring Indian Economy, Bombay.

.....

1.1 - Literacy and Illiteracy: 1901 - 1971

	Number of literate (In crores)	Number of illiterate	Literacy(per cent)		
			Total	Male	Female
1901(a)	1.3	22.5	5.4	9.8	0.7
1911(a)	1.5	23.7	5.9	10.6	1.1
1921(a)	1.8	23.3	7.2	12.2	1.8
1931(a)	2.6	25.3	9.5	15.6	2.9
1941	...	...	...	...	...
1951(b)	6.0	30.1	16.7	25.0	7.9
1961	10.5	33.4	24.0	34.4	13.0
1971	16.1	38.7	29.5	39.5	18.7

Notes: (a) Relates to undivided India (b) Excludes Jammu and Kashmir

SOURCE: Registrar General and Census Commissioner, Census of India 1971 India, Pocket Book of Population Statistics.

Highlights

1. It is shocking but true that since independence, the number of illiterates in India has increased by about 10 crores, even as the number of literates has also risen by about 11 crores.
2. Strange as it may seem, the drive for adult education, which was one of the popular activities of the political and youth organisations during pre-independence years, has almost disappeared as a non-official voluntary activity.
3. If the earlier enthusiasm had continued and expanded, illiteracy could have been almost completely wiped out within the quarter century of independence. That it has not been done, reflects very sadly on the sense of social responsibility of the educated elite of this country.
4. Many developing countries have achieved literacy rates much higher than that of India. In particular, illiteracy has been almost completely eradicated through popular voluntary efforts in China.

	Class I to V			Classes VI to VIII			Classes IX to XI		
	Number of educational institutions ('000)	Students in age Group 6 to 11 Lakhs	Percentage to total population in this age group.	Number of educational institutions	Students in age group 11 to 14 Lakhs	Percentage to total population in this age group.	Number of educational institutions	Students in age group 14 to 17 Lakhs	Percentage to total population in this age group
1950-51	210	192	42.6	13,596	31	12.7	7,288	12	5.3
1951-52	215	193	43.3	14,576	34	13.5	8,063	14	6.0
1952-53	222	203	44.4	15,340	36	14.6	8,719	15	6.4
1953-54	239	217	46.7	16,252	38	15.1	9,515	16	6.7
1954-55	264	232	49.4	17,318	40	15.8	10,200	17	7.0
1955-56	278	252	52.8	21,730	43	16.5	10,833	19	7.4
1956-57	287	267	54.5	24,486	46	17.3	11,805	20	9.1
1957-58	298	282	56.7	27,015	49	19.3	12,639	22	9.2
1958-59	302	308	57.3	39,597	54	20.7	14,326	24	9.7
1959-60	319	326	61.5	41,921	61	20.7	15,703	25	9.3
1960-61	330	350	62.4	49,663	67	22.5	17,257	29	10.6
1961-62	352	389	67.4	55,915	76	26.8	19,306	33	12.9
1962-63	366	419	70.9	61,377	82	29.0	21,440	36	13.7
1963-64	377	445	72.0	65,588	90	27.9	22,996	40	13.5
1964-65	385	482	75.5	72,153	98	29.4	25,252	46	15.0
1965-66	391	505	76.7	75,798	105	30.8	27,477	50	16.2
1966-67	396	529	78.1	79,493	115	32.4	29,900	55	17.1
1967-68	...	551	...	...	124	...	...	60	...
1968-69	399	555	77.3	83,943	123	32.3	32,433	66	19.3
1969-70	...	577	...	...	131	...	...	71	...
1970-71	404	593	80.3	88,587	134	34.1	35,773	72	20.4
1973-74	...	638	83.9	...	150	35.6	...	85	22.0
1974-75	...	669	86.7	...	162	37.5	...	90	22.8
(Target)									

SOURCE: 1. Planning Commission, Basic Statistics Relating to the Indian Economy, 1950-51 to 1965-66 & 1950-51 to 1969-70, Annual Plan, 1967-68 and 1968-69, Fourth Five Year Plan, 1969-74, The Fourth Plan Mid-Term Appraisal, Volume II, Draft Fifth Five Year Plan 1974-79, Volume II, and Annual Plan 1974-75
 2. Publications Division, Ministry of Information and Broadcasting, India 1971-72 and 1973

Highlight 1. It is platitudeously true that the primary schools constitute the very foundation of the entire education edifice in the country. Yet, tragically enough, this layer is accorded unacceptably to priority in the government policy and practice. The school buildings, teaching aids as also salaries, status and quality of teachers - all these are terribly shabby at the primary level.

1.3 - Expenditure on Education: 1960-61 to 1974-75

Year	Central government	State governments	Total (1)&(2)	(Rs. crores)
				Col. (3) as per cent of GNP
	(1)	(2)	(3)	(4)
1960-61	44	195	239	1.6
1961-62	26	235	261	1.6
1962-63	28	251	279	1.6
1963-64	31	279	310	1.6
1964-65	42	319	361	1.6
1965-66	49	373	422	1.3
1966-67	96	420	516	1.9
1967-68	112	356	468	1.4
1968-69	123	402	525	1.6
1969-70	137	680	817	2.3
1970-71	159	793	952	2.5
1971-72	178	887	1,065	2.5
1972-73	195	1,034 (RE)	1,248	2.5
1973-74	210 (RE)	1,152 (BE)	1,363	2.4
1974-75	290 (BE)	...	....	...

Note: From 1966-67 onwards, the data include expenditure on scientific services and research in respect of Central government.

SOURCE: 1. Reserve Bank of India Bulletin, various issues
 2. Government of India, Explanatory Memorandum on the Budget of the Central Government, various issues

Highlights

1. A significant part of the finances for education comes from the fees paid by the students and private charity. But still about three-fourths of the total expenditure on education is financed by the Central, State and local governments.
2. A disproportionately large part of the expenditure is devoted to high school and college education, the benefits of which accrue only to about top 5 per cent of the Indian population. As such, the present educational system tends only to buttress the dominant position of the upper income groups in the Indian society.
3. There is an urgent need for a radical restructuring of the educational system along the following lines:
 - (a) A massive campaign for adult education to completely wipe out illiteracy.
 - (b) A crusade to improve the quality of education at all levels and particularly at primary and high school levels by improved teachers' training, raising the teacher/student ratio, increasing the salaries of teachers and providing them better educational aids and better buildings.
 - (c) A bold programme of recasting the curriculum and teaching methods to make all the courses (from economics to technology) less bookish and more operationally significant.
 - (d) Giving a strong vocational bias to all courses to ensure that those who come out of educational institutes do not remain unemployed, simply because - as is the situation today - they are unemployable.

- 10 -
1.4 - Outturn of Science Graduates and Post-graduates: 1963-64 to 1968-69

Faculty/Degree	Number of recipients of degrees						Percentage increase between 1963-64 and 1968-69
	1963-64	1964-65	1965-66	1966-67	1967-68	1968-69	
<u>Faculty of Science</u>	<u>41,128</u>	<u>46,040</u>	<u>51,129</u>	<u>59,424</u>	<u>70,489</u>	<u>86,984</u>	<u>111</u>
B.Sc.	34,046	38,230	42,437	49,767	59,045	74,242	118
M.Sc.	6,571	7,290	8,009	8,892	10,454	11,722	78
Doctorate	511	520	683	765	990	1,020	100
<u>Faculty of Agriculture</u>	<u>5,468</u>	<u>6,836</u>	<u>6,005</u>	<u>7,117</u>	<u>6,788</u>	<u>8,516</u>	<u>56</u>
B.Sc. (Agri.)	4,718	5,569	4,902	6,129	5,476	6,976	48
M.Sc. (Agri.)	698	1,140	1,011	892	1,223	1,417	103
Doctorate	52	127	92	96	89	123	137
<u>Faculty of Veterinary Science</u>	<u>1,108</u>	<u>1,184</u>	<u>962</u>	<u>1,303</u>	<u>1,153</u>	<u>1,397</u>	<u>26</u>
B.V.Sc.	999	1,030	855	1,120	996	1,206	21
M.V.Sc.	109	151	104	174	136	173	59
Doctorate	-	3	3	9	21	18	
<u>Faculty of Medicine</u>	<u>4,577</u>	<u>5,596</u>	<u>6,604</u>	<u>7,437</u>	<u>8,033</u>	<u>9,413</u>	<u>106</u>
M.B.B.S.	3,789	4,635	5,516	6,317	6,892	8,197	116
M.D/M.S.	771	940	1,049	1,115	1,121	1,190	54
Doctorate	17	21	39	5	20	26	53
<u>Faculty of Engineering Technology</u>	<u>10,007</u>	<u>10,347</u>	<u>13,269</u>	<u>14,662</u>	<u>16,108</u>	<u>15,808</u>	<u>58</u>
B.V/B.Sc. (Engg.), B.Sc. (Tech.) etc.	9,466	9,739	12,710	14,001	15,422	15,225	61
M.D/M.Sc. (Engg.), M.Sc. (Tech.) etc.	515	576	520	628	620	508	-1
Doctorate	26	32	39	33	66	75	188
<u>Total</u>	<u>62,288</u>	<u>70,003</u>	<u>77,969</u>	<u>89,943</u>	<u>1,02,571</u>	<u>1,22,118</u>	<u>96</u>

SOURCE: University Grants Commission, Annual Report, 1971-72 and previous issues

Highlights 1. While the later data are not yet published, the current figure

of the total outturn of science graduates and post-graduates may be in the neighbourhood of 2,00,000. At least in absolute terms, this figure compares favourably with the corresponding figure for most of the European countries. But in relation to the population of India, the present outturn of science graduates and post-graduates should be regarded as too small.

2. However, the matter that should cause us the utmost concern is the poor quality of these graduates and post-graduates.
3. Out of about 1,22,000 science graduates and post-graduates turned out in 1968-69, as many as about 87,000 or about seventy per cent came from the general faculty of science and only about 35,000 from other faculties with a pronounced applied bias. There is an urgent need to execute a big shift from the general faculty of science to other applied faculties to ensure that these graduates and post-graduates prove useful to the economy.
4. The relative neglect of the agriculture sciences in an agrarian country like India should be regraded as most deplorable.

LIST OF MEMBERS OF THE TECHNICAL SUB-GROUP ON EDUCATION:

1. Dr. Prem Kirpal,
63 F, Sujan Singh Park,
New Delhi.
2. Dr. (Mrs) Kunthala Jayaraman,
Deptt. of Biological Sciences,
Madurai University, Madurai.
3. Prof. Y.Saran,
Principal,
Technical Teachers Training Institute,
Bhopal - 462002.
4. Dr. (Mrs.) Madhuri R.Shah,
Vice-Chancellor,
Shreemati Nathibai Damodar Thackersey
Women's University,
1, Nathibai Thackersey Road,
Bombay - 400020.
5. Prof. G.R.Damodaran,
Principal,
PSG College of Technology,
Peolamedu, Coimbatore-641004.
6. Prof. Rais Ahmed,
Director,
National Council of Educational
Research & Training (NCERT),
Shri Aurobindo Marg,
New Delhi - 110016.
7. Dr.Malcolm S.Adishesiah,
Vice-Chancellor,
Madras University,
Madras.
8. Prof. Rasheeduddin Khan, M.P.,
Dean,
Jawaharlal Nehru University,
New Mehrauli Road,
New Delhi - 110057.
9. Prof. Gurubaksh Singh,
Vice-Chancellor,
University of Hyderabad,
Golden Threshold,
Nampally Station Road,
Hyderabad-500001. A.P.
10. Dr.Nandini Joshi,
D-145, Defence Colony,
New Delhi.

11. Dr. D.P.Nayar,
Adviser,
National Staff College,
N.C.E.R.T.,
Shri Aurobindo Marg,
New Delhi - 110016.
12. Prof. M.V. Mathur,
Director General,
National Council of Applied Economic Research,
Parsila Bhavan,
11, Indraprastha Estate,
New Delhi - 110001.
13. Prof. B.M.Udgaonkar
Tata Institute of Fundamental Research,
Homi Bhabha Road,
Bombay-400005.
14. Dr.S.N.Saraf,
Chief (Education),
Planning Commission,
Yojana Bhavan,
New Delhi.
15. Mr.M.N.Kapoor,
Principal,
Modern School,
Barakhamba Road,
New Delhi - 110001.
16. Dr. S.C.Seth,
Member-Secretary,
NCST Panel on Futurology. Convenor