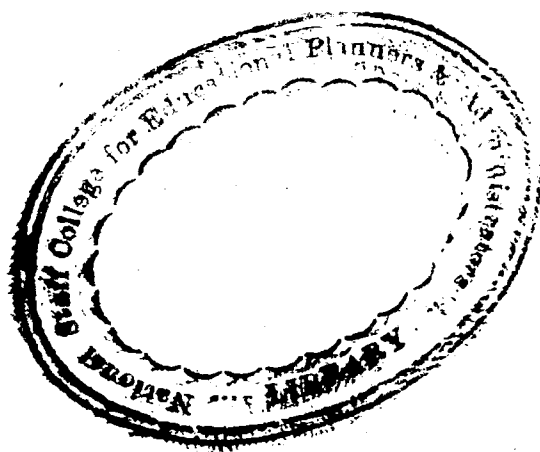


# EDUCATIONAL STATISTICS

Theoretical and practical approach with special reference to India

M. M. Kapoor

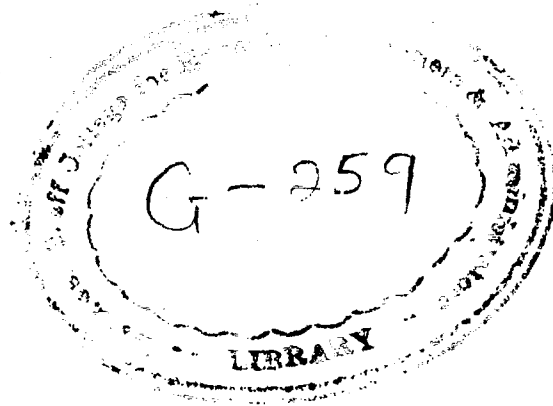


STATISTICAL UNIT  
MINISTRY OF EDUCATION  
GOVERNMENT OF JAMMU & KASHMIR  
JAMMU/SRINAGAR.

Research-Report submitted to  
the Central Statistical Organisation for  
Specialisation Course in Educational Statistics:1969-70

E D U C A T I O N A L     S T A T I S T I C S

\* Theoretical and practical approach  
with special reference to India



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## I N T R O D U C T I O N

### Plan of Study

The present study was undertaken to fulfil the requirements of the 'Specialisation Course in Educational Statistics' organised by the Central Statistical Organisation of Cabinet Secretariat during 1969-70. This course was for three months and was conducted at following various centres from 6th April to 4th July, 1970:

i/ Seven weeks at the Ministry of Education & Youth Services

During this period I was made conversant with the terminology used in the forms for collection; study and scrutiny of Form A, A-2, A-4, B and B-1; methods of reconciliation of discrepancies and tabulation of data for publication. Detailed discussions were also held on methodologies of projections and the analytical studies of wastage and stagnation.

ii/ One week at University Grants Commission

It included study of both the types of Forms B-4 - their contents, scrutiny and methods of tabulation for publication.

iii/ One week at Institute of Applied Manpower Research

This period was wholly confined to the methodologies adopted in educational statistics.

iv/ Three days at Asian Institute of Educational Planning and Administration

Study in the Institute was devoted to the statistical methods needed for educational planning.

v/ Two weeks at National Council of Educational Research and Training.

Within this period visits to all its Departments were organised to study and discuss the various surveys and projects undertaken by each of them.

vi/ One week at Education Division of Planning Commission

This period was utilised to understand the process and methods of educational planning in India.

vii/ Three days at Manpower Research Division of Central Statistical Organisation

The programme of study concluded with the final discussions on the different agencies collecting educational statistics in India and the gaps and suggestions thereof.

### Previous work on this Subject

It is only fair to mention that very few other people before this have worked in this area and that too only in concrete situations. Methodological aspect has been elaborately dealt with by international agencies like U.N.E.S.C.O. and O.E.C.D. but that is in a very scattered form. On official educational statistics in India, there are only two authentic publications - one in shape of 'Manual' by Ministry of Education and the other in shape of 'Working Paper' by the Institute of Applied Manpower Research.

The present study is, therefore, a systematic attempt designed to provide for the first time some help in a consolidated form to the educational statistician/<sup>or</sup> equivalent technician who is faced with the task of collection, tabulation and analysis of educational statistics in general and its application to educational planning in specific.

### Plan of Chapters

The study has been divided into three sections with selected references in the end of each chapter.

i/ Section I: With five chapters, deals with the methodological aspects of educational statistics viz. its nature, scope, etc.

ii/Section II: With also five chapters deals with educational statistics and planning viz. statistics needed for educational planning; enrolment, teachers, classrooms and cost and outlay provisions.

iii/Section III: With six chapters has been specifically devoted to the study of official educational statistics viz. its historical perspective, sources, flow of data, coverage, publication, and major gaps and suggestions.

By no means I claim this study to be exhaustive and original. Notwithstanding my best efforts to cover a very wide ground, it is possible that some areas might have escaped. Furthermore, statistical development being a continuing process, there cannot be any finality to a treatment of this nature; while existing statistical gaps are being filled in, the need for fresh and more elaborate study will be progressively arising. The present study represents only the first step in this direction.

I should avail of this opportunity to express my thanks to all the organisations and individuals who extended their valuable guidance and co-operation without which it would have not been possible to complete this work. Thanks are also due to the administrative machinery of Education Department of J & K State for contributing to the success of <sup>my</sup> efforts by getting this Report printed.

July 20, 1970

Srinagar

*Mans Mohan Kapoor*

-----  
This report expresses the opinions of the author and not necessarily of the Department where he is employed.  
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C O N T E N T S

A c k n o w l e d g e m e n t s : 2

I n t r o d u c t i o n : 3

SECTION I

METHODOLOGICAL APPROACH TO EDUCATIONAL STATISTICS : 10-45

CHAPTER : I

Nature, Scope and Uses : 10

CHAPTER : II

Coverage : 13

Statistics of educational institutions : 13

Statistics of literacy : 18

Statistics of educational attainments  
of population : 18

Statistics of educational finance : 19

CHAPTER : III

Collection : 21

Sources of educational statistics : 21

Methods of collection : 21

Basic approaches for collection : 22

Aggregate lists : 22

Individual data system : 23

The design of annual questionnaire : 23

Period of Reference : 26

CHAPTER : IV

Presentation : 28

Analytical tables : 28

Graphic representation : 29

Diagrams and charts : 30

CHAPTER : V

Analysis : 35

Rates, ratios and index numbers : 35

Wastage and other rates : 41

SECTION II

EDUCATIONAL STATISTICS AND PLANNING

47-78

CHAPTER : VI

Statistics Needed for Educational Planning : 47

Demographic statistics : 47

Manpower statistics : 48

Socio-economic statistics : 48

Educational statistics : 48

CHAPTER : VII

Enrolment Projections : 50

Projections, prediction and forecasting : 50

Factors determining growth of school  
enrolment : 50

Process of projections : 52

Basic methods of projections : 52

Grade-cohort method : 52

Enrolment-ratio method : 56

Projection for different stages of  
education : 60

Area projections : 61

Models for enrolment projections : 61

Conclusion : 63

CHAPTER : VIII

Teacher Projections : 64

Assumptions for projection : 64

Methods of forecasting : 65

Models for projections : 66

CHAPTER : IX

Classroom Projections : 67

Factors affecting projection : 64

Methods of projection : 67

CHAPTER: X	<u>Costs and Outlay Projections: 68</u> Other relative terms and concepts:68 Need for unit costs :68 Components of costs of education :68 Steps in projection :70 Analysis of past educational expenditure:71 Projection for current expenditure:71 Models for projection of current expenditure :72 Projection of capital expenditure :74 Models for projections of capital expenditure :75  <u>SECTION III</u>	
	<u>EDUCATIONAL STATISTICS IN INDIA</u>	80-125
CHAPTER : XI	<u>Historical Perspective:80</u> Upto 1947:80 From 1947 to 1960 :80 From 1960 onwards :81	
CHAPTER : XII ✓	<u>Sources: 87</u> Ministry of Education & Youth Services:87 University Grants Commission:39 National Council of Educational Research and Training:90 Census of India:91 National Sample Surveys :91 Central Statistical Organisation:92 Institute of Applied Manpower Research:92 Planning Commission: 93 Directorate General of Employment and Trainings: 93 Other minor sources :93	
CHAPTER : XIII	<u>Flow of Data :95</u> Ministry of Education & Youth Services:95 University Grants Commission:97 National Council of Educational Research and Training :97 Other Organisations :98	
CHAPTER : XIV	<u>Coverage :99</u> Form A :99 Form A-1 :102 Form A-2 :103 Special information :103 Form B :103 Form B-4 :105	
CHAPTER : XV	<u>Publications: 107</u> Regular publications:107 Ad-hoc publications:107 Ministry of Education & Youth Services :107 University Grant Commission:110 National Council of Educational Research and Training :111 Planning Commission :113 Institute of Applied Manpower Research :114 Asian Institute of Educational Planning and Administration:115 Census of India:116	

National Sample Survey : 116  
Director General of Employment  
and Trainings : 117

CHAPTER : XVI

Major Gaps and Suggestions : 118

Aimless duplication : 118  
Improvement in methods of data  
collection : 119  
Time-lag in collection and  
publications : 119  
Improvement in quality of data: 120  
Simplification of forms used for  
collection : 120  
Standardization of concepts and  
definition : 121

Special studies and projections: 122  
Scope of Coverage : 123

B i b l i o g r a p h y : 125



LIST OF TABLES

TABLE I : Proposed Duration of Compulsory Education in Asian Countries : 13  
TABLE II : Items to be included in a Basic Programme of Educational Statistics : 24  
TABLE III : Enrolment at Different Stages in some selected States in India, 1965-66 : 28  
TABLE IV : African Primary Schooling in Uganda, 1962 : 29  
TABLE V : Size of Primary Classes : 29  
TABLE VI : Enrolment by Age and Grade : 37  
TABLE VII : Movement of Cohort at Primary Stage : 41  
TABLE VIII : School Survival Ratios : 52  
TABLE IX : Crude Promotion Rates  
TABLE X : An Example of Projected Enrolment Computation : 58  
TABLE XI : Total School Enrolment Projections - 1975 : 59  
TABLE XII : Components of Costs on Education : 69

LIST OF DIAGRAMS

DIAGRAM I : Number at Different Ages receiving Education : 31  
DIAGRAM II : Number at Each Level of Education : 31  
DIAGRAM III : An Example of Educational Pyramid : 34  
DIAGRAM IV : Enrolment Flow : 32  
DIAGRAM V : Flow of Pupils From One Level to Another : 33  
DIAGRAM VI : Effect on Stock Position of Increasing Entry in Grade I : 33  
Diagram VII : Enrolment in Higher Education in India, 1950-51 to 1965-66 : 34  
DIAGRAM VIII : Data Flow Chart of Ministry of Education : 95  
DIAGRAM IX : Flow Chart of University Grants Commissions : 97  
DIAGRAM X : Flow Chart of N.C.E.R.T. : 97

M E T H O D O L O G I C A L    A P P R O A C H

T O

E D U C A T I O N A L    S T A T I S T I C S

- I. Nature, Scope and Uses
- II. Coverage
- III. Collection
- IV. Presentation
- V. Analysis

## CHAPTER

### NATURE, SCOPE AND USES OF EDUCATIONAL STATISTICS

The field of educational statistics covers all types of numerical or quantitative data relating to educational institutions, processes and results. In practice, three major areas may be distinguished :-

- a/ census statistics concerning the educational characteristics of population;
- b/ current administrative statistics relating to educational institutions and finance; and
- c/ ad-hoc statistics collected in connection with studies of educational problems.

The first area overlaps the field of demographic statistics and is mainly concerned with the enumeration and measurement of population with respect to literacy & illiteracy, mental ability and educational attainment of the individual and the type of educational institution, if any, the individual is attending at the times of census. The enumeration of the entire population of a country with respect of these questions usually takes place at a general population census.

The second area is the chief preoccupation of the statistical bureaux in official and non-official agencies concerned with education. This area includes current quantitative data on schools, teachers and pupils at all levels and for all types of education, receipts and expenditure of government and other public bodies for educational purposes, number of students who pass examinations, receive promotion, certificates and diplomas (or fail to do so).

The last major area covers all kinds of data collected in connection with ~~ad-hoc~~ investigations of educational problems which are susceptible to statistical analysis. These may be mainly concerned with the number and capacity of school buildings and classrooms; the scholastic achievement, physical measurements and mental health of pupils; the social origin of school pupils and university students, the costs of education; absenteeism and wastage. These investigations may or may not be repeated at certain intervals and the source of data, coverage of population, methods of compilation and analysis etc. will vary in each case according to the nature of the problems.

#### Uses of educational statistics

Statistics are not an end in themselves. They are tools for use in making decisions. "Good statistics are expensive to collect and analyse; bad statistics are not worth the money spent on them." Not to have a clear idea of the purposes to which statistics are to be put will mean that they will be inefficiently collected and analysed.

presented, and thus the scarce resources of developing countries are wasted.

We may not at the outset discard two extreme positions regarding the usefulness of statistics on education. One such position - on the conservative side - holds that all kind of educational statistics which have ever been collected must have been useful for some purpose, hence they should continue to be collected indefinitely. Particularly in regard to current official statistics on education, there may be the real or imaginary danger of losing the continuity of statistical series established over a long period of time. Yet the continued usefulness of long established statistical series certainly needs to be examined from time to time, in order to make room for other type of data for which the need may become more apparent or urgent as time goes by.

The other extreme position - on the radical side - holds that statistics are only useful if they serve an immediate need in connection with some problem under study or investigation. Thus, all compilation would be on an ad-hoc basis and there would be no need whatever for established statistical series. It would surely be unfortunate if one could not count on some continuity in the compilation of certain basic statistics relating to schools, pupils, teachers and expenditure on education, which could provide necessary information on past and present trends in the educational development of a country.

There is a middle ground between these two extreme positions and it would be useful - in fact essential - to consider, in the light of the national experience and requirements, what types of educational statistics should be collected and compiled, which of them on regular continuing basis and which of them from time to time as need arises.

The uses and the functions of educational statistics can be grouped under following heads :-

a/ Statistics and Administration:

Administrators and planners are the two groups of people who use educational statistics as tools for making decisions. Education is a large scale operation that may account for 10 to 25 percent of government expenditure in developing countries. It must, therefore, be subject to detailed accounting as a part of the annual budgeting control of government and the provision of estimates. Detailed financial statistics are required for this purpose. Education is further a decentralized activity with a large local and voluntary element. The maintenance of national standards and of sound practices relies upon the provision of reports, including statistics from below, complementary in many cases to the provision of financial assistance from above.

b/ Statistics and Evaluation of Educational system:

Educational statistics provide an overall statistical picture of the extent and working of the educational system. They present a concrete summary picture of the educational conditions at a given time,

terms. In addition, they also show the relationships between different aspects of the educational situation at a given time, thus bringing to light any anomalous condition which requires special attention. When presented in shape of time series they trace the lines of educational development in terms of changes which have occurred and the directions and rates of such changes. And, on the basis of past trends and present conditions, they suggest the probable direction and rates of changes in the future development of education. Taken in conjunction with statistics from other fields, such as demographic and economic statistics, they provide a basis for measuring the level and of social development in a given country or community.

c/ Educational Statistics and Planning :

In the light of national or local requirements and aspiration they serve as the foundation and framework for educational planning and policy making. Once educational plans and policies are determined they make it possible to measure periodically the realization of plans and policies in precise terms.

d/ Publicity

Less important than planning, publicity is nonetheless very useful. Although statistics should not be collected solely for this purpose, modern publicity requirements make it an important consideration when statistics are being collected and used. Not only governments themselves usually publish educational statistics, there are also requests made of governments for statistical information, including the requests by international agencies particularly UNESCO, for statistical information to document the world position and make comparisons between national systems and the many requests, for example, from universities and other research bodies and from business interests, which the Ministry of Education normally endeavours to meet, sometimes on the basis of a reciprocal information service.

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References

1. U.N.E.S.C.O; Manual of Educational Statistics, 1961, Paris, Chapter I. p.10.
2. United Nations Statistical Office, Handbook of Population Census Methods, Rev.1 (2 Vols), New York, 1958, 1959 (Studies in Methods; Series F, No. 5, Rev.1 )
3. UNESCO, World Survey of Education, Handbook of Educational Organisations and Statistics, Paris, 1955, Chapter III. The Statistical Reporting of Educational System. p.50.

CHAPTER II

COVERAGE

As far the coverage of educational statistics is concerned, it may be divided into following major categories :-

- a/ Statistics of educational institutions;
- b/ Statistics of literacy;
- c/ Statistics on the educational attainment of the population; and
- d/ Statistics of educational finance.

a/ Statistics of educational institutions

The basic unit for these statistics is an institution which imparts education at some level or other. To determine the level and type of institutions, the educational system may be broadly divided into following major categories :-

- i/ pre-primary education      ii/ primary education
- iii/ secondary education or education at second level :
  - iii' a/ general education
  - b/ vocational education
  - c/ teacher training
- iv/ higher education or education at third level
  - a/ general education
  - b/ professional/vocational education
  - c/ teacher training
- v/ education not classified by level

i/ Pre-primary Education : Pre-primary education is meant for those children who are not grown up enough to attend regular primary schools. This is generally limited to children from three or four to five or six years of age. This level of education is also known as childhood education, infant education, nursery education, kinder-garten education etc. The emphasis on these schools is more on the healthy development of the child physically, mentally and socially rather than on the acquisition of specific knowledge and skill such as reading, writing and arithmetic.

ii/ Primary Education ( Education at Ist level ) : This is the basic level of education provided in all the countries. Many of the countries have made it compulsory. The period of compulsion ranges from four to eight or nine years as will be evident from the example of some of the following Asian countries:-

T A B L E I  
Proposed Duration of Compulsory Education in Asian Countries

<u>Country</u>	<u>Age limit</u>	<u>Duration</u>
1. Afganistan	7	6
2. Burma	-	-
3. Combodia	6	6
4. Ceylon	5-14	9
5. China (Taiwan)	6-12	6
6. China (Mainland)	-	-
7. India	6-14	8
8. Indonasia	6-12	6
9. Iran	7-13	6
10. Iraq	6-12	6
11. Israel	5-14	9
12. Japan	6-15	9
13. Korea	6-12	6
14. Laos	6-9	3
15. Lebanon	-	-
16. Malaysia	-	-
17. Mongolia	8-15	7
18. Phillipines	-	-
19. Thailand	7-14	4-7
20. Vietnam	6-14	3

Source : Statistical Year Book, 1964, p.p. 88-89 UNESCO, Paris.

Generally, primary education starts at six years of age, though in some countries it may start as early as five years or as late as seven or eight years. Education at this level is concerned with the child's acquisition of the knowledge of three R's ( reading, writing and arithmetic ) and emphasis is given to the physical, mental, social and emotional development of the child.

iii/ Secondary Education ( Education at the second level ): It usually starts after the completion of primary education, but there are certain countries where middle level education intervenes between the two. In such cases middle level education should be divided rationally between the primary and secondary levels. Very often the age of entry ranges from ten to fourteen years and the duration of the secondary education is about six years.

Generally, secondary education is sub-divided into lower and high stages. At the lower stage, there is no specialisation and the courses offered are some for all the pupils, but at higher stage, a certain amount of specialisation and diversification is offered according to their tastes and aptitudes. The UNESCO has laid down the following recommendations regarding the classification of education at the second level :

- a/ General education which does not aim at preparing the pupils directly for a given trade or occupation.
- b/ Vocational education, which aims at preparing the pupils directly for a trade or occupation other than teaching.
- c/ Teacher training which aims at preparing the pupils directly for teaching.

iv/ Higher Education ( Education at third level )

All education after secondary level is treated as higher education. Specialised courses/etc. as also course in humanities, science, law, commerce etc. come under this category. Different systems are in vogue and the total duration of higher education differs from country to country. Institutions at this level : may be either degree granting or non-degree granting. Education at this level is also sub-divided into general, vocational or technical, and teacher training according to the nature of the course offered.

v/ Education not classified by level :-

These are certain types of educational institutions which are not usually classified by level, since by their nature they either cover more than one level or are not directly related to any particular level of education. Examples will be given here of provisions for :-

- a/ special education ,
- b/ adult education,
- c/ education by correspondance, radio and television.

a/ Special education :- This is the type of education given to those pupils " who divide so far physically, mentally, emotionally or specially from the relatively homogeneous groups of so-called 'natural' pupils that the standard curriculum is not suitable for their educational needs ". Provision for special education are made in special schools, special classes attached to regular schools, or special institutions which may be called by other names than schools. The education thus provided is usually at the primary level, but may also include studies at the secondary level.

b/ Adult Education :- This type of education is mainly provided for the adult population who have either not been to school before or are not currently receiving full time education. Hence the level of instructions may vary from primary to post-secondary.

c/ Education by correspondance, radio & television :- This type of education exists in many countries as a complement to all the other types of organised education is characterized by the fact that the teacher and his pupils do not find themselves in physical presence of each other.

From the point of view of the contents, these statistics fall under following main categories :-

- i/ Statistics of schools
- ii/ Statistics of pupils
- iii/ Statistics of teachers
- iv/ Statistics of other staff

1. Statistics of schools :- These are the places where educational programme is carried on. For definition purposes, we must first of all understand the distinction between :-
  - school as an administrative unit ( school establishment )
  - school as a physical unit ( school building ) ; and
  - school as an institutional unit ( school composed of group of pupils ).

School as an administrative unit has been defined as " An individual school establishment will be reckoned every school building ( i.e. building containing classrooms ) which stands by itself and in the vicinity of any other school building. Two or more school buildings which stand close together will be reckoned as a single school establishment ".

Similarly, school as a physical unit has been defined by United States office of education as " a division of the school system consisting of a group of pupils composed of one or more grade-groups, organised as one unit with one or more teachers to give instructions of a defined type, and housed in a school plant of one or more buildings. More than one school may be housed in one school plant, as in the case when the elementary and secondary programme are housed in the same school plant"

From above it is clear that both the statistics of school establishments and of school buildings have their own usefulness but the main interest will be in the reporting of schools/an instructional units. For this purpose Ministry of Education of India's definition of an educational institution is most suitable :-

" An educational institution is a group of pupils ( students) of one or more grades to receive instruction under one teacher or under more than one teacher including an immediate head".

It may also be mentioned here that the school as a statistical unit is of little use for international comparisons since there is no consistency in the size of the unit. It may vary from a one-room, single teacher school in a rural community to an institution comprising many buildings and housing thousands of pupils in large city. However, since the count of schools is always of national interest, statistics of schools should be comprehensive one. It should be shown by type of management and for each level (or stream where appropriate) showing:

- i/ number
- ii/ size and location ; and
- iii/ equipment

2. Statistics of pupils:- At some point a person becomes recognised as a pupil or student usually through the act of registration or enrolment, in a school or other type of institution. So it is not difficult to obtain a count of all pupils in a school at a given time. Three main problems arise in this connection :-

- i/ who are to be treated as students ?
- ii/ what should be the date of reference ?
- iii/ what should be the method of counting ?

UNESCO has recommended the following definition of the pupil:-

"A pupil (student) is a person enrolled in a school for



The alternative use of terms 'pupil' and 'student' has been introduced because of their customary usage by different countries i.e. the term 'pupil' is used in connection with lower levels of education while the term 'student' refers to enrolment in universities and other institutions for higher education. But at international level both the terms can be used interchangeably without reservation especially when more than one level of education is involved.

After accepting the definitions of pupil (student) as mentioned above, the problem of counting full-time and part-time pupils or students arises. The definition of part time and full time pupils may vary from country to country to the situation obtaining in that country, but following may be taken as acceptable definition as suggested by UNESCO :

" A full time pupil(student) is one who is enrolled for full time education for a substantial period of time."

" A part time pupil (student) is one who is not a full time pupil (student)."

Next, we are faced with the problem of determination of the criterion to count the total number of students in the educational system. The counting of pupils within a school may be done by grade or by class. The grade or year of study is a unit in the vertical organisation of a school. It is a step on the 'educational ladder'. The class is a unit on the horizontal organisation of a school. It is the instructional unit which relates the pupil to the teacher on the one hand and to the classroom on the other hand. In a very small school, such as one teacher or two teacher school in a rural community, there may be pupils of several grades grouped in the same class. In large school there may be several classes of pupils belonging to the same grade. In order to keep a clear distinction between the two basic concepts of grade and class, the following definitions are recommended for international reporting by UNESCO :

" A grade is a step of instruction usually covered in the course of a school year".

" A class is a group of pupils(students) who are usually instructed together during a school term by a teacher or by several teachers ",

The gradewise number of pupils helps us in studying important problems regarding output, stagnation, wastage etc. While the classwise enrolment is necessary to meet various statutory and other provisions made in the educational system of the country e.g. a country may lay down that a class should not consist of more than a particular number of pupils.

Statistics of number of students give rise to the following problems also :-

- should the total number of students be taken as those who have been enrolled; or
- those who are attending the schools; or
- those who have appeared in various school examinations

According to the purpose in view we have to choose one of these criteria. If we are interested in finding out the places that would be required in case of compulsory education, we should probably be interested in knowing the total enrolment. But if we are interested in the output of the educational system, we would be more interested in finding out the number of those attending the school regularly or those who take various school examinations. Whatsoever method is applied, it should be seen that no student is counted more than once nor is he excluded altogether.

The date of reference for the collection of these statistics will naturally depend on the purpose in view. If the purpose is to know the number of places to be provided, some date in the beginning of the academic session will be the most suitable one. But if the emphasis is on the output of the educational system, probably a suitable date of reference will be towards the end of the academic year and close of the final examination. UNESCO

recommends that a date near the close of the academic year may be preferable.

After the deciding the problems encountered above, we should collect the following information regarding students (pupils):-

- i/ their number by sex and age;
- ii/ in each grade for first and second level schools;
- iii/ in each type of school and at each level
- iv/ subjects studied - in part in second level schools and more fully in third level institutions;
- v/ number of repeaters;
- vi/ transfers and deaths in first and second schools; and
- vii/ successful leavers.

3 Statistics of teachers :- The main problem encountered in counting the number of teachers is regarding inclusion or exclusion of non-teaching personnel engaged by school system or institution concerned. The definition recommended for international reporting by UNESCO is the following :-

- \* A teacher is a person directly engaged in instructing a group of pupils (students). Heads of educational institutions, supervisory and other personnel should be counted as teachers only when they have regular teaching work".

It is fact that count of all personnel employed by the educational system may be necessary from time to time for budgetary and planning purposes. But the chief item of interest in current educational statistics is the number of teachers, not including other instructional personnel such as principals librarians, psychologists etc. If, however, a principal or school librarian has at the same time regularly teaching functions, then he should be counted as teacher, perhaps as a part-time teacher. In this connection. the Ministry of Education of India's definition is more liberal 'the head of the institution will, however, be treated as a teacher even if he is not participating in teaching. Research guiding staff, demonstrators, tutors and directors of physical education, physical training instructors will also be shown as teachers'. This deviation from international standard definition seems to be these possibly to suit Indian conditions.

The other main problem which occurs usually is that of dealing with full time and part time teachers. The normal work load of a teacher is often specified in the school laws and regulations of a country. Teachers who teach less than the required number of hours per week may be reported as part time teachers. It is preferable to give separate figures for whole time and part time teachers with details about the required number of hours of work, so that, if necessary, conversion and other manipulation can be made without any difficulty.

The date of reference for taking the number of teachers should be the same as the one for pupils, since the pupil-teacher ratio which is very frequently utilised for planning purposes, can be determined correctly only if the count of teachers and pupils is taken on the same date .

Statistics of teachers should show :-

- i/ their number by sex
- ii/ general qualifications
- iii/ whether part time or not
- iv/ in each type of school
- v/ at each level of education
- vi/ information on subjects taught at second and high levels
- vii/ general characteristics - some indication of each teachers position immediately prior to teaching
- viii/ details of resignations and deaths
- ix/ age wise distribution
- x/ salary wise distribution

4. Statistics of other staff :- It includes non teaching personnel engaged by educational system whose complete enumeration is essential from time to time specially for budgetary and planning purposes. Such staff employed by school system may include the following :-

- i/ Administrative personnel e.g. superintendents of schools, or chief education officers and their deputies, assistants and inspectors etc.
- ii/ Instructional personnel only those who do not take part in teaching work e.g. principals, supervisors, school librarians, guidance personnel, psychologists etc.
- iii/ Health personnel e.g. school physicians, dentists, nurses and other professional and technical persons dealing with the physical and mental health of the pupils etc.
- iv/ Auxiliary personnel e.g. secretaries, clerks, custodians, watchmen and other types of persons concerned with administration transportation, food and recreational services etc.

We must collect information regarding their

- a/ number by sex
- b/ type; and
- c/ cost of their maintenance

### B. STATISTICS OF LITERACY

In backward countries this type of statistics is of great use where educational facilities are meagre and a maximum education indicator such as the extent of literacy can be expected to show how quickly conditions are improving. Literacy can nevertheless only be approximately measured and the basis can vary between one census and another and certainly between one country and another.

Literacy has been defined by UNESCO as follows :-

" A person is literate who can, with understanding, both read and write a short simple statement on his everyday life".

" A person is illiterate who cannot with understanding both read and write a short simple statement on his everyday life",

Census statistics give figures pertaining to literacy and the educational level of the population. These figures are collected at the time of the census. Since census operations are carried out on a large scale, it is difficult to collect detailed statistics on educational activities of the country. Only those educational statistics can be collected during the census which may be regarded as broad indicators of certain educational characteristics of the population.

For an illustration, we may take the 1961 Census of India. The individual slip which was used for the collection of information about each individual member of the country consisted of 13 questions. One of these related to 'literacy and education'.

" Q. 6 Literacy and Education

1. Illiterate or literate : For a person

- 1. who can neither read nor write or can merely read out but cannot write in any language
- 2. who can both read and write "

Where the question of literacy is not included in a national population census or if a national population census is for some reason not feasible then a sample survey may be carried out on this subject. This method can also be used to supplement the data already collected through census.

Statistics of literacy should cover the following aspects:-

- i/ literates and illiterate, sex-wise
- ii/ separately for urban and rural population;
- iii/ for different social and religious groups;
- iv/ by years of school completed etc.

### C. STATISTICS ON THE EDUCATIONAL ATTAINMENT OF THE POPULATION

The ability to read and write may be considered as the maximum level of educational attainment of an individual with the development of education in all countries and its extension to an ever increasing segment of the population, it becomes important to measure the highest level of education attained by each person, and the average level of education attained by the total population of a given country or by a given population group. Here the definition of

'literacy' is not enough. UNESCO has recommended the following definition for this purpose :-

" The educational attainment of a person is the highest grade or level of education completed by the person in the educational system of his own or some other State ".

The emphasis in the definition is on the words 'highest' and 'completed'. This type of statistics can also be collected through census or survey which should depict the information.

- i/ sex and age wise
- ii/ separately for urban and rural areas; and
- iii/ by level of education; etc.

D. STATISTICS OF EDUCATIONAL FINANCE:- Coming to the statistics on educational finance, UNESCO has laid down the following definitions:-

'Receipts refer to cash received by or made available to or for schools including appropriations, sub-ventions, fees, cash values of property received as gifts etc."

'Expenditure refers to financial charges incurred by or/behalf of schools for goods and services".

' Recurring expenditure includes all expenditures except those for capital outlay and debt services."

' Capital expenditure refers to expenditure for land, buildings, equipments etc."

' Debt services refer to the payment of interest and the repayment of principal loans".

The major difficulty under this head arises in case of that expenditure which is not incurred directly in respect of a particular institution or institutions. The expenditure incurred on inspection and supervision belongs to this category. Generally, there is a bulk provision in the budget for the construction of buildings or for other capital items. It, therefore, becomes very difficult to find out what amount has been spent on the buildings for a particular school or what is its share of expenditure as far inspection and supervisions is concerned. In such cases, the accounting system of the country has to be studied and then a decision can be taken regarding the allocation of such expenses to different institutions or to different levels and types of education. In India, expenditure of this type has been defined as 'indirect expenditure' as opposed to 'direct expenditure' which is incurred directly for running an educational institution.

Those elements of educational costs which can easily be identified with specific activities i.e. teachers salaries are called 'direct expenditure' and those elements which cannot be easily or accurately identified with specific activities e.g. maintenance expenses are called 'indirect expenses'.

For the data required for international reporting, we may refer to Unesco questionnaires for the "World Survey of Education" Vol. III which requires statistics of the educational finance in the following form :-

I. Education receipts by sources :-

- i/ Central or federal government
- ii/ Provincial, State or similar government
- iii/ Country, city, district or other local authorities
- iv/ Tuition fees
- v/ Other gifts from parents
- vi/ Gifts, endowments etc.
- vii/ Other sources ( specify )

II. Educational expenditure by purposes

A. Recurring expenditure

- i/ For administration or general control
- ii/ For instructions
  - Salaries to teachers and other directly supportive professional staff;
  - other instructional expenditure
- iii/ Other current expenditure

B. Capital expenditure by purposes ( not including debt services )

- iv/ Educational facilities ( school buildings, classroom and laboratory

C. Debt services

III. Recurring expenditure on education, by level and type of education

- a. Central administration (not distributed by level and type of education)
- b. Instructional expenditure (distributed by level and type of education) :
  - i/ Education preceding the first level (pre-school education).
  - ii/ Education at the first level ( Primary education)
  - iii/ Education at the second level (secondary education):
    - a/ general b/ vocational c/ teachers' training
  - iv/ Education at the third level (higher education)
  - v/ Special education
  - vi/ Adult education
  - vii/ Other types of education
- c. Other recurring expenditure.

References

1. UNESCO, Statistics of Education in Developing Countries, 1968, Paris, Chapter EI, P.9.
2. UNESCO, Manual of Educational Statistics, 1961, Paris, Chapter V, P.78.
3. Office of Education. The Common Core of State Educational Information, Washington, D.C., 1953, P.3 (State Educational Records and Reports Series, Handbook I)
4. Ministry of Education, Government of India, 'Manual of Educational Statistics- India- 1964, New Delhi, P.14
5. Census of India- 1961
6. For a general discussion of the use, of a sample survey when a census is not feasible, see United Nations Handbook of Population Census Methods, Vol.I, Chapter VIII.
7. UNESCO, Questionnaire on Statistics of Educational Institutions and Statistics of Educational Finance, (St/Q/37), 1959, Paris.

... COLLECTION

To collect basic educational statistics there are mainly six ways which cannot be regarded as mutually exclusive. A well organised programme of educational statistics will utilise all the six. They are :-

- i/, Regular censuses of pupils in all educational institutions.
- ii/ Regular sample surveys of pupils in all educational institutions or in a sample of educational institutions.
- iii/ ~~Ad-hoc~~ surveys at irregular intervals.
- iv/ Popular censuses
- v/ Sample surveys drawn from the total population probably in conjunction with population census.
- vi/ Routine reporting of data obtained as a by-product of educational administration.

It may be mentioned that not all educational data need to be collected annually, and not all need to be collected from the total population. For most of the flow data, yearly intervals are appropriate, corresponding to the normal length of time spent by pupils in each grade. However, much can be collected less frequently and from sample surveys. Frequent data collection is not necessary where the attributes of the population being surveyed change only slowly. Conversely, some data may be collected more often than annually, for example, information about attendance of courses of less than a year's duration.

Sources:

Basic sources of educational statistics are the records of :-

- i/ schools and universities
- ii/ local and regional education offices
- iii/ departments within the Ministry of Education; and
- iv/ other Government Departments e.g. the departments responsible for census and for the registration of births and deaths and the Public Works Department.

In addition, the statistician may undertake special inquiries, for example, at schools or at parents' houses.

Methods

There are following three methods through which education statistics can be collected :-

- a/ Personal inquiry
- b/ Postal census
- c/ Sample inquiry

∴ a/ Personal inquiry :- This method can be followed to obtain such information as is available from universities, other departments in the Ministry and other Government Departments. In case of local officers and local school managements, the personal approach is most effective. A discussion with those concerned will help the educational statistician to discover what is available or could be made available under certain conditions and to secure the cooperation of voluntary or independent organisations, without which educational statistics will remain seriously defective. "In the early days, at least, statistician must also be a salesman". This method of personal inquiry cannot be utilised in case of a postal census as it is also not feasible with more than a few schools at a time

b/ Postal census :- Under this method a questionnaire is sent annually or occasionally more frequently to the heads of the all institutions in the Educational system, either directly or through local officers. This method has become the usual method of collecting educational statistics because it presents a number of conveniences to the statistician. In case of local offices this method should also be supplemented by the personal approach.

C. Sample inquiries :- This method is new and increasingly important source of information in developing countries and may take the form of a postal questionnaire to a selected sample of schools, or houses etc. or by arranging for trained enumerators to visit these schools or houses etc. The main limitation of this method is that its use calls for resources not always available at present to the educational statistician of a developing country.

Following considerations must be taken into account before any method is followed :-

- i/ It should suit the requirements of the information
- ii/ to the convenience of the informant
- iii/ to the resources available to the statistician but nevertheless to the ease of the statistician.
- iv/ Personal knowledge of the sources of the records and the people using them will help the statistician to frame his inquiries realistically.

Basic approaches for collection:-

Whatever of the six above mentioned ways is adopted for obtaining data, there are two basic approaches to the collection and processing of the statistics.

- a/ Aggregate lists
- b/ Individual Data System ( I.D. System ).

a/ Aggregate lists :- A certain amount of aggregation and preliminary processing of data can be done by the basic reporting unit - usually the educational institutions. Thus, for example, the school reports the total number of pupils in each class, the total number of teachers in the school etc. This is one of the traditional methods of educational data collection. Except in rather complex forms, this method is inadequate for the collection of flow data.

In order that satisfactory statistics can be collected from the schools a few basic records must be properly maintained:

- i/ The school list :- The statistician must first make available a list of all the schools that he wishes to document. This is necessary to ensure that all schools are sent the necessary inquiry forms from the statistician and as a check on the response rate. It can also be used as a "frame" from which to draw a selection of schools when a sample inquiry is contemplated. The information, suitably transferred to a school map is also of use to the planners. The list must record as a minimum for each school its full address and the name of the headmaster. For use as a sampling frame further particulars ( level and type of school, number of pupils with sex and of teachers ) would be desirable.

In the list, the schools should be separately coded, that is given a number or letter or both for quick and informative identification. The level of education provided by the school might be coded in a simple fashion and added to the district code to give an informative registration number to each school. Thus a primary school in the District "S"..... might be registered S/P.

- ii/ School records :- The basic school records are the school register and the class register. The quality of data collected depends upon the care and accuracy with which these records are maintained in the school. In principle, they constitute a continuous record of the population at school. Such records become really unreliable where school conditions are unsatisfactory, teachers are not adequately trained and the headmasters lack the time to produce good school records. School registers consist



of a list of pupils having enrolled with particulars for each is the main record while the class registers provide data regarding pupil-enrolment, pupil's attendance and the pupil's school history.

These registers should be properly designed at the outset as statistical as well as administrative documents. They should be durable, laid out for the convenience of the teacher and for ease of statistical summary and printed in a standardized form.

b/ The Individual Data System (I.D. System):- In the case of individual reporting instead of the educational institutions submitting aggregate data for the entire institution, the institution submits the information on each component of the aggregate (these components can be pupils, teachers, buildings etc.) On entering the educational system the pupil or his parent completes a questionnaire with required information on sex, age and such background information as may be needed. It might include psychological facts about the child of interest to the educator. The information is entered on a separate card for each pupil in every school and kept in a central register.

These cards are then kept up-to-date by incorporating the latest information of pupil's school life or important changes in his home circumstances, such as the death of father etc. This reporting need not be at shorter intervals than every year provided that the educational institution records the events as they occur.

So, the reporting can be the result of answers to the questionnaires filled out by the individual himself, or by teachers or other responsible authorities. The information thus obtained is processed by the statistical authorities, who can aggregate it in a number of different ways according to specific needs. This method of data collection and processing is very valuable for compiling 'flow' tabulation and is usually called 'An Individual Data System (I.D.S.)'. In it problems of flow statistics can be dealt with almost in routine manners, any cohort or other group of pupils could be examined in relation to its present place in the educational system and to the previous years. Forecasting models of the most complex kind could then be built.

So, the main advantage of I.D. System is that once the constant characteristics of an individual have been recorded they need never be reported again. It also permits the follow-up and recording of the educational experience of each pupil and for teacher. Other substantial returns of this method are:-

- i/ this system provides considerable improved data;
- ii/ this improved quantity and quality of data makes for more varied and interesting set of analysis possible;
- iii/ it may make it possible to reduce the burden of reporting and aggregating data by individual institutions and headmasters.

In most of the countries, many of the systems of individualized data collection currently in use are restricted to one branch of education and the even one type of institution. While this may be desirable for purposes of pilot experiments, it severely limits the usefulness of such data for planning purposes. Most of the transactions of pupils which are really important to educational planners are those between types and levels of education. Moreover, the initial costs of establishing an I.D. System are likely to be high, thus limiting its use to mainly developed nations.

#### The Annual Questionnaire Design:-

For educational statistics the primary units are the educational institutions existing in the country and the main method for obtaining the information is the questionnaire issued annually or at frequent regular intervals by the Ministry of Education to the heads of institutions. The questionnaire here should be in the form of a standard questionnaire



proforma which should be properly drawn out to possess following qualities :-

- e/ The form should be clear i.e. easy to read, clear to its instructions, uncumbered with unnecessary detail, and specific both in regard to the kind of information requested and the date to which it refers.
- v/ Entremes of size should also be avoided. If too small, it may easily become crumpled or get lost. If too large it may become unmanageable and also forbidding to the eye.
- c/ Instead of being a set of questions, it should be a set of summary tables of a simple kind and should conform to the conditions of a good table. Space should be provided for figures to be entered clearly and easily.
- d/ There should be separate forms for each type of institution at each level and these may be distinguished by colour to avoid confusion in distribution and subsequent sorting.
- e/ To avoid a mass of letter-press on the tables, simplified instructions should be printed on the reverse side, or more fully in an accompanying leaflet.
- f/ It is also useful to offset the impersonal character of such<sup>a</sup> document by a covering letter and framing the instructions in a suitable language.
- g/ The form should also be printed.
- h/ If a new form is proposed to be introduced it is essential that it should be first given a trial by a pilot test on a selected group of institutions, before it is sent for final printing.

The proforma may better be split into several parts and only those items should be included in the pro-forma sent to different organisations which are relevant to them and on which they can supply necessary information.

It may be worthwhile to list the items that may be included in a basic programme of educational statistics as far as it relates to formal institutionalised instruction. The following list enumerates most of the important items. This list has to be modified according to the educational system and the peculiar needs of particular countries.

T A B L E II

Items to be included in a Basic Programme of Educational Statistics

- 1. Institutions
  - a/ By levels of education and specialisation ( general, technical and teacher training )
  - b/ By management
  - c/ By location - rural or urban
  - d/ By area and population served
  - e/ By distance
  - f/ By sex characteristics - for boys or for girls or coeducational
  - g/ By courses of study offered
    - i/ name of the course
    - ii/ minimum admission qualification
    - iii/ duration of the course
    - iv/ degree or diploma awarded
    - v/ seats offered
  - h/ By enrolment
- II BUILDINGS
  - †. Details
    - a/ Total area
    - b/ Built-in-area
 

	<u>Permanent</u>	<u>semi-permanent</u>	<u>temporary</u>
i/ for lecture rooms and halls			
ii/ for laboratories and educational purposes			
iii/ for library			
iv/ for common rooms			
v/ for other purposes			
    - c/ Area of playgrounds
    - d/ Area of auditorium
    - e/ Area of gymnasium

- f/ Area of swimming pool
- g/ Hostel area

2. Utilisation

- a/ Number of shifts held in the same building. ( with details about type, level, sex, enrolment etc. )
- b/ Total number of working days in the year
  - Ist shift                      2nd shift                      3rd shift
- c/ Average number of hours utilised per working day for schooling ( including curricular and other activities ).
  - Ist shift                      2nd shift                      3rd shift
- d/ whether utilised for other purposes. If yes;
  - i/ total number of days thus utilised in the year
  - ii/ total number of hours thus utilised

III STUDENTS ( grade-wise and course-wise )

- a/ Enrolment on a particular date
  - i/ full-time pupils
  - ii/ part-time pupils
- b/ Distribution of students by age and sex
- c/ Number of students offering different optionals
- d/ Number of those benefitting from scholarship, freeships, free meals etc.
- e/ Distribution of students by parental occupation, education and income.
- f/ Average daily attendance
- g/ Number of leavers without completing the course ( or grade ) during the academic year. ( difference between those duly enrolled in the beginning of the session and those on rolls on the 1st working day of the session ).

IV. EMPLOYEES

- a/ Teaching staff ( separate for different levels )
  - i/ sanctioned strength by qualification and salary scales
    - whole time
    - part time
  - ii/ number by age, sex, qualification, salary as on a specific date
  - iii/ number of teachers for optional/ special subjects
  - iv/ number of part time teachers
  - v/ distribution of teachers by grades, subjects and hours taught per week.
- b/ Supervisors and inspectors
- c/ other staff
  - i/ administrative and maintenance staff
  - ii/ others

V. EXPENDITURE BY PURPOSE

1. Recurrent

- a/ Salaries of
  - i/ teachers and other directly supportive administrative staff.
  - ii/ supervisors and inspectors
  - iii/ other staff
- b/ Maintenance of equipment, appliances
- c/ Health, free ( or subsidised ) meals and other services
- d/ scholarships and other financial aid given to students
- e/ other items

2. Non-recurring

- a/ Buildings, furniture and fixtures
- b/ Hostels
- c/ Staff quarters
  - i/ teaching staff
  - ii/ others
- d/ Equipment and appliances
- e/ other items

3. Debt - services

- a/ Payment towards principal
- b/ Interest

VI. EDUCATIONAL RECEIPTS BY SOURCES

- a/ Receipts from central or federal government
- b/ Provincial, State or similar government
- c/ Country, city, district or other local authorities
- d/ Tuition and other fees
- e/ Community contributions
- f/ other sources ( specify details if possible )

VII. EXAMINATIONS ( grade and course wise )

- a/ Number applied for examinations
- b/ Number appeared
- c/ Number passed in
  - i/ first attempt ( or minimum )
  - ii/ second attempt
  - iii/ more than two attempts

VIII. FOLLOW-UP OF THOSE WHO PASS SECONDARY EXAMINATION

- a/ Total number of those passing the secondary examination.
- b/ Follow-up
  - i/ total number of those joining the institutions of
    - higher learning in
      - general education
      - technical education
      - teacher training
    - vactional type ( polytechnic and other institutions turning out technicians of intermediate level ).
  - ii/ total number of those getting employed
  - iii/ others

IX. OUT OF SCHOOL EDUCATION (Adult education/correspondence courses)

- a/ Number of grades ( or courses )
- b/ Number of classes
- c/ Duration of courses in each grade
- d/ Number of hours of study ( per day / per week )  
( in case of Adult Education only )
- e/ Grade-wise enrolment on a specific date
- f/ Number of those successfully completing the course
- g/ Expenditure for the period

Recurring

- a/ Salary teaching staff, supervisors, others
- b/ Rent of building etc.
- c/ Maintenance of building and equipment
- d/ Lighting charges
- e/ Stationery charges
- f/ Supply of books and reading materials
- g/ Expenditure on follow-up programme
- h/ others

Non-recurring

- a/ Expenditure on building
- b/ Expenditure on equipment
- c/ Expenditure on other items

Problems of period of reference

From the point of view of period of reference, educational statistics may be divided into two broad categories:-

- i/ those referring to a point of time ; and
- ii/ those referring to a period of time.

Under first category come statistics pertaining to enrolment, number of teachers etc. While the figures pertaining to receipts and expenditure, examinations, drop-outs, etc. are included in the second category.

The next question arises as to what should be the date of reference for giving enrolment figures. Should it be in the beginning



CHAPTER V  
PRESENTATION

Statistics pertaining to each individual are necessary for our study, but it is not the individual figures in which we are really interested. We want to simplify the figures collected and present them in a clearer form. This gives a clear picture of the situation and it is easier to analyse them further. Data may be presented in the following forms :-

- a/ Analytical tables
- b/ Graphic presentations i/ Graphs; ii/ diagrams, charts and pictures

a. Analytical Tables:

After the basic material is sorted and classified, the process of statistical analysis begins by using tables drawing upon a suitable selection of material or upon a suitable summary of the material, one moves away from reference tables to analytical tables.

With too much detail the eye is confused, comparisons are made difficult and judgement is hampered. Analytical tables are designed to bring out particular features of the material. Usual types of these tables are :-

- a/ those showing geographical distribution
- b/ those comparing one year with another and thus showing a time series.
- c/ two way tables
- d/ frequently tables

i/ Geographical distribution tables :

Following example will make clear the tables of this form :-

T A B L E III

Enrolment at different stages in some selected States in India, 1965-66

<u>Name of the State</u>	<u>Enrolment at different stages of education</u>				
	<u>Primary class I-V</u>	<u>Middle class VI-VIII</u>	<u>Secondary including teachers training class IX-above</u>	<u>University</u>	<u>Total</u>
Andhra Pradesh	36,77,081	6,61,746	3,53,317	56,361	47,48,505
Assam	14,52,677	3,22,068	2,10,294	40,560	20,25,599
Bihar	38,03,089	6,60,599	4,56,090	1,08,813	50,25,591
M. P.	30,00,000	5,50,000	2,55,840	33,488	38,39,328
Orrisa	17,67,711	2,34,900	1,15,108	18,760	21,36,479
Punjab	23,10,900	5,48,500	2,81,399	54,459	31,95,298
U. P.	80,16,553	14,05,016	5,45,438	3,22,888	10289,895

SOURCE : SELECTED EDUCATIONAL STATISTICS 1965-66, MINISTRY OF EDUCATION, GOVERNMENT OF INDIA, NEW DELHI, 1966

Another example of this nature has been taken from Uganda :-

TABLE IV: AFRICAN PRIMARY SCHOOLING IN UGANDA, 1962

Reported enrolment in aided schools as a percentage of boys and girls aged 7 to 13 : by district

Description	Estimated number of children aged 7 to 13 January, 62		Reported enrolment in grant-aided primary schools, 62		Enrolment in aided schools as percentage of children aged 7 to 13	
	Males	Females	Males	Females	Males	Females
Districts	'000	'000	'000	'000	%	%
Uganda	132	125	58.0	45.0	44	36
<b>Western:</b>						
Agisai	29	26	20.3	9.0	70	35
Akedi	28	24	15.5	8.2	56	34
Busoga	43	43	22.0	12.5	51	29
Buso	28	28	17.9	8.9	64	31
Total	128	121	75.7	38.6	59	32
<b>Eastern:</b>						
Karamoja	16	14	3.2	0.6	20	4
Kigezi	29	26	17.6	8.1	61	31
Koli	24	21	19.8	7.7	82	37
White Nile	37	31	24.3	8.1	66	26
Total	106	92	64.9	24.5	61	27

Sources : Ministry of Education and Statistics Branch, Ministry of Economic Affairs, Uganda.

- ii/ Time series tables : In these tables the date to which the statistics refer and their definition is to be clearly specified.
- iii/ Two-way tables: Such tables are of great use to educational statisticians. Mostly these are used to present enrolment by age and grade - the grades are shown vertically (columns) and the ages horizontally (rows). In each square (cell) is the number of a particular age in a particular grade.
- iv/ Frequency tables: These tables show how often a particular characteristic occurs. Following simple illustration gives an idea about it :

TABLE: V                      Size of Primary class

Size of class	Number of pupils (in thousand)	Pupils in (2) as percentage of all pupils
1-15	4.0	1
16-20	11.7	3
21-25	25.6	6
26-30	52.8	14
31-35	98.0	24
36-40	140.2	35
41-50	67.6	17
51 and over	0.5	0.1

Graphic presentation:

Usual methods of graphic presentation may be divided in two groups:

- i/ Presentation with the help of graphs; and
  - ii/ Presentation with the help of diagrams, charts and pictures.
- i/ Graphs : In graphic presentation points are plotted on a graph paper on a suitable scale. The graph form lends itself particularly to comparing a set of trends, for example, a comparison over a period of years of the numbers sitting and the numbers receiving

examinations in different schools by means of two ~~graphs~~ on the same ~~the~~ sheet. Care must be taken not to overload the graph since the result may be confusing.

The following important points should be kept in view while drawing a graph :

- A suitable heading should be given.
- The characteristics represented by X & Y axes as also the scales should be clearly mentioned.
- If zero point has been omitted this fact should be clearly indicated by means of a broken line.
- For easy reference the source of data may be mentioned at the bottom

ii

ii/ Diagrams & Charts

Diagrams take the process of classifying, simplifying and summarizing statistical data one stage further. By this, the quantities may be more easily grasped by the eye than in a table. It may be noted that diagrams may supplement tables but seldom replace them. The diagrammatic presentation may take form of pictographs, population density map, pic-charts, bar-charts, histogram etc.

Some important forms in which data can be presented diagrammatically are as follows :

The educational pyramid

If numbers enrolled at each level are drawn as areas against a vertical age scale, a pyramid results giving the distinctive profile of the educational system.

In developing countries, where children may be late in enrolling, the pyramid shape is distorted at the lower ages. This distortion usually indicates the stage of development in the educational system, the objective being to achieve the full pyramid profile. Where there is a falling birth rate this profile may not emerge although this is unlikely to be the case in a developing country. These educational pyramids can be drawn as shown in Diagram I and III. (Page 31, 32)

Stock and flow statistics

The simple educational pyramid can serve to illustrate a fundamental distinction in educational statistics; that between stock and flow. The stock position shows the level of educational facilities reached at specific date, as per example, the enrolment of pupils at various levels on 31st March or the numbers and types of teachers in past at the commencement of the school year. The planner is also interested in the recruitment of teachers during any year, that is flow of new teachers into profession or the flow of pupils into the school system (entrants to individual grades) and out of the school system (leavers) or within school system (promotion from one grade to another or from one level to another).

The flow can be measured directly as when the supply of teachers is measured by totalling the recruitment during the period and deducting the losses by way of death, resignation or change to other work. Flow can also be inferred by comparing the stock levels at two precisely similar dates. For pupils, stock measurement at successive points in time is more usual. If in diagram IV and V, the educational pyramids for three years (t, t+1, t+2) are compared, it will be seen that these are flows.

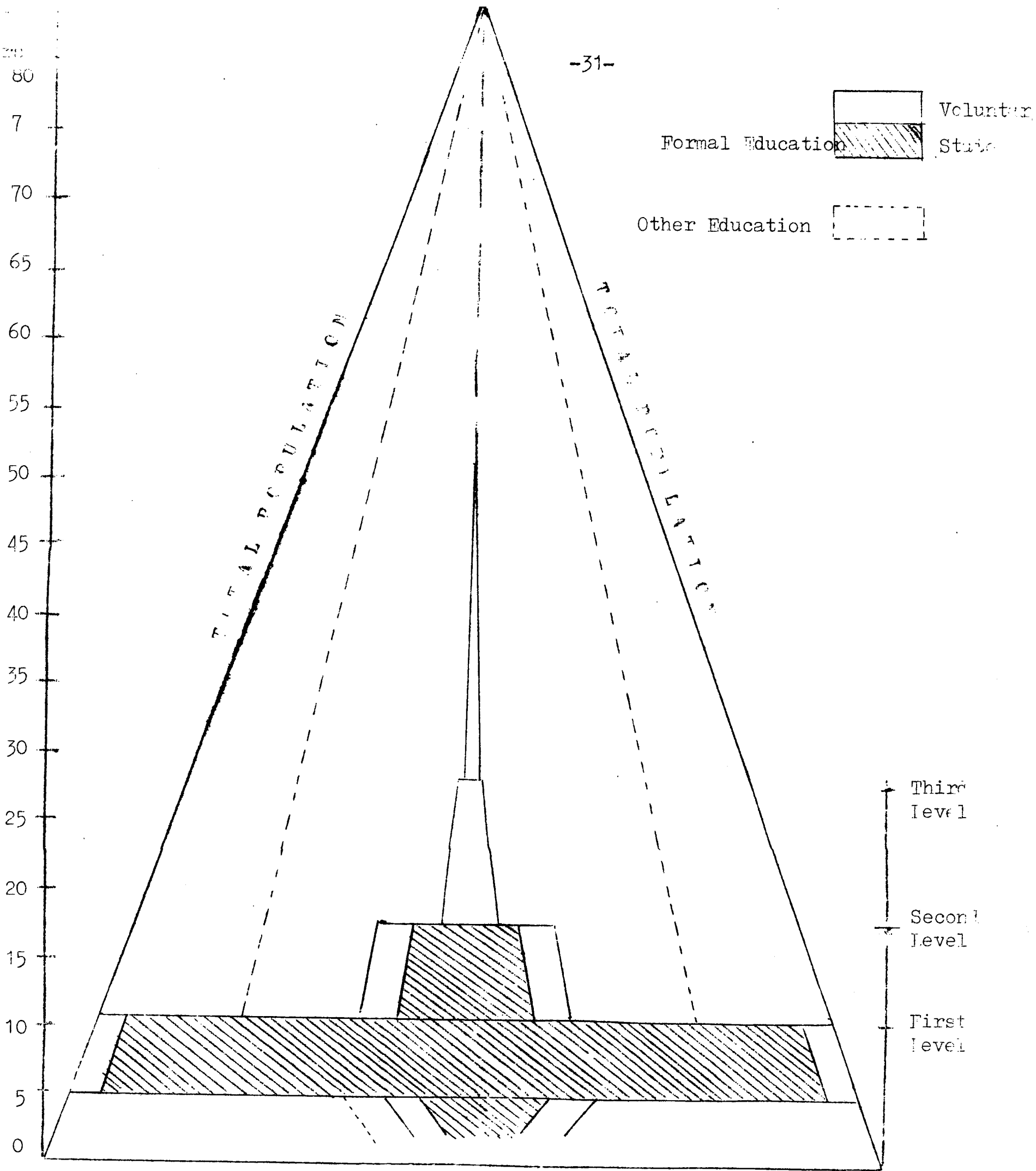


DIAGRAM: I. NUMBERS AT DIFFERENT AGES RECEIVING EDUCATION

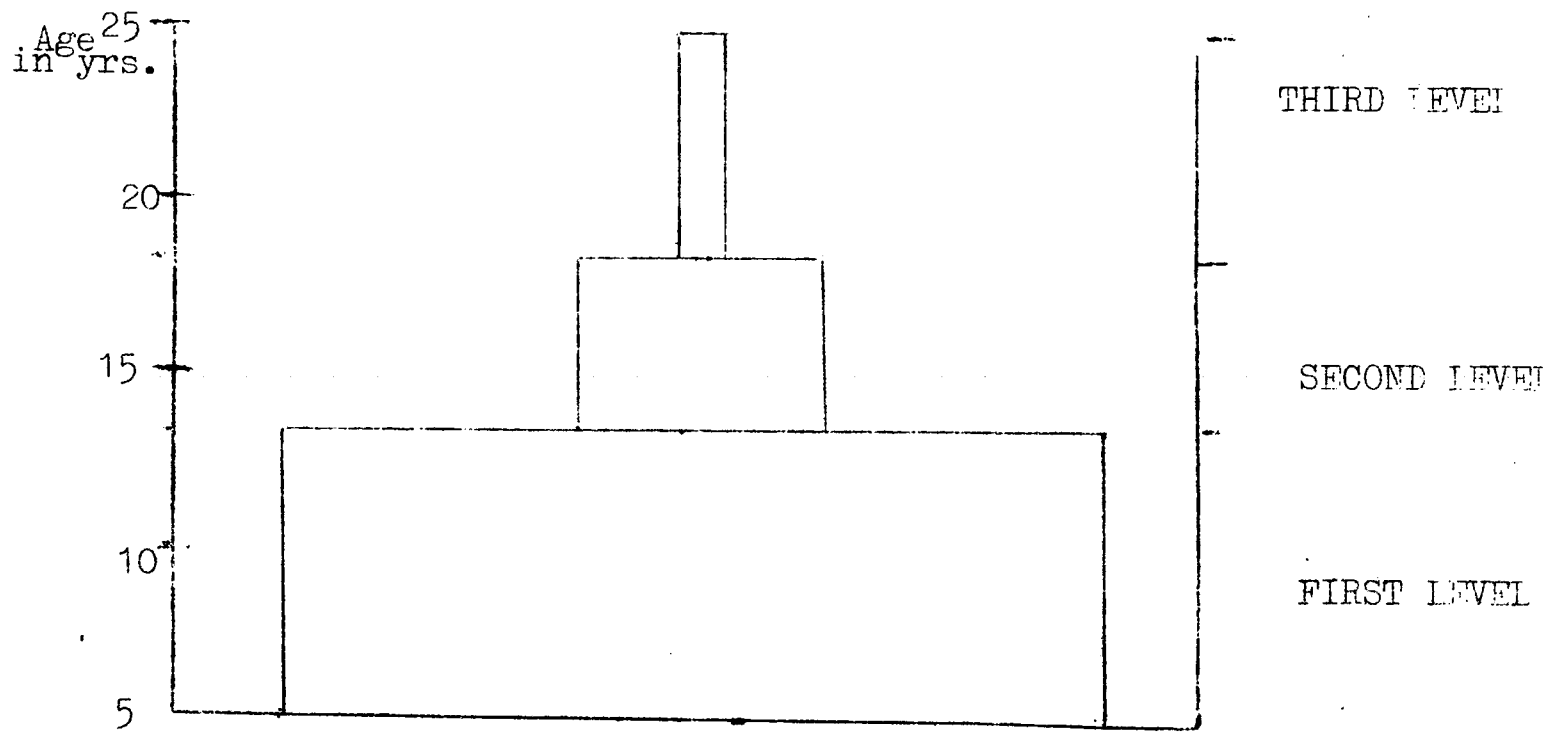


DIAGRAM: II. NUMBERS AT EACH LEVEL OF EDUCATION



DIAGRAM: III. EDUCATIONAL PYRAMID

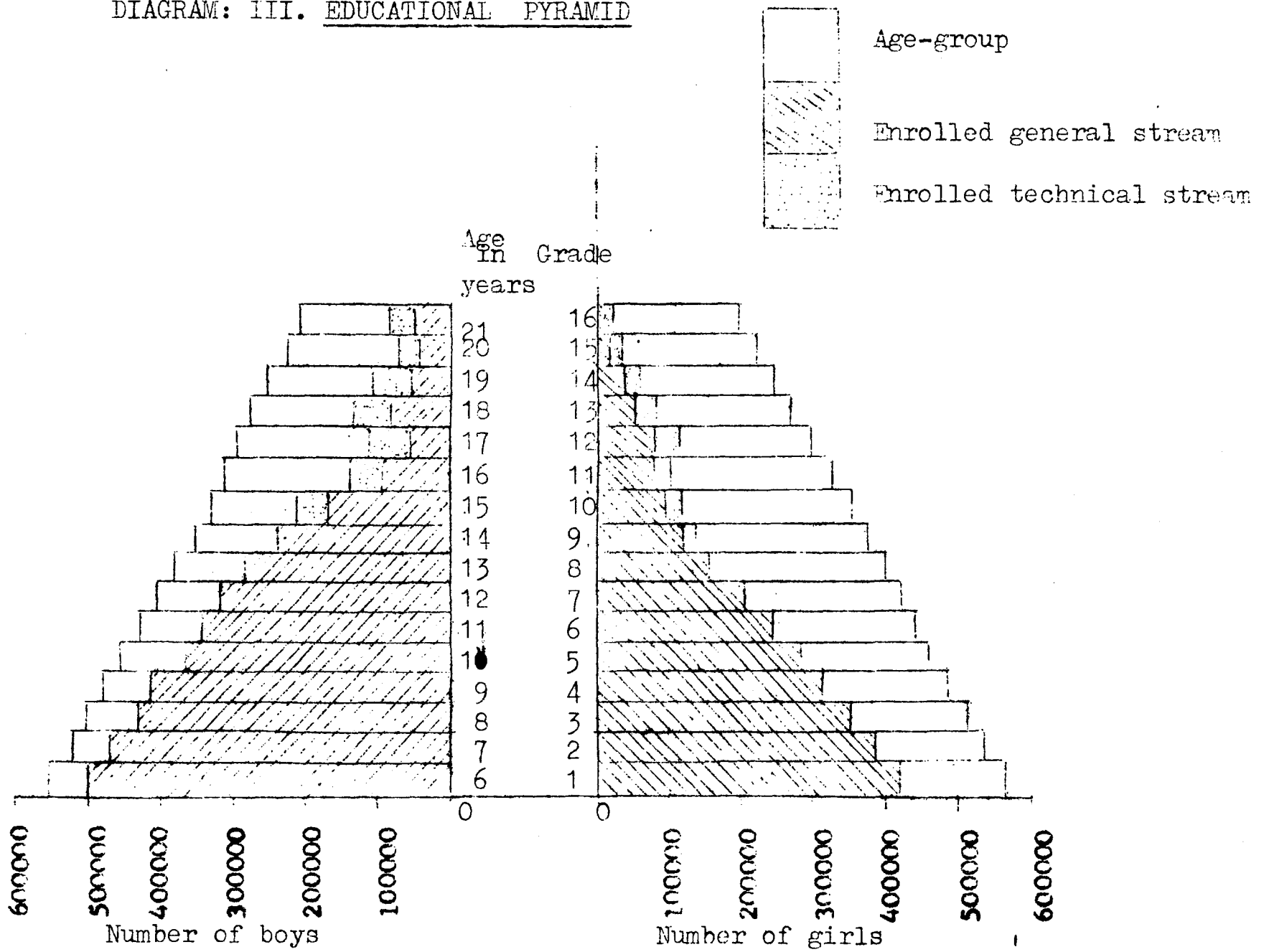
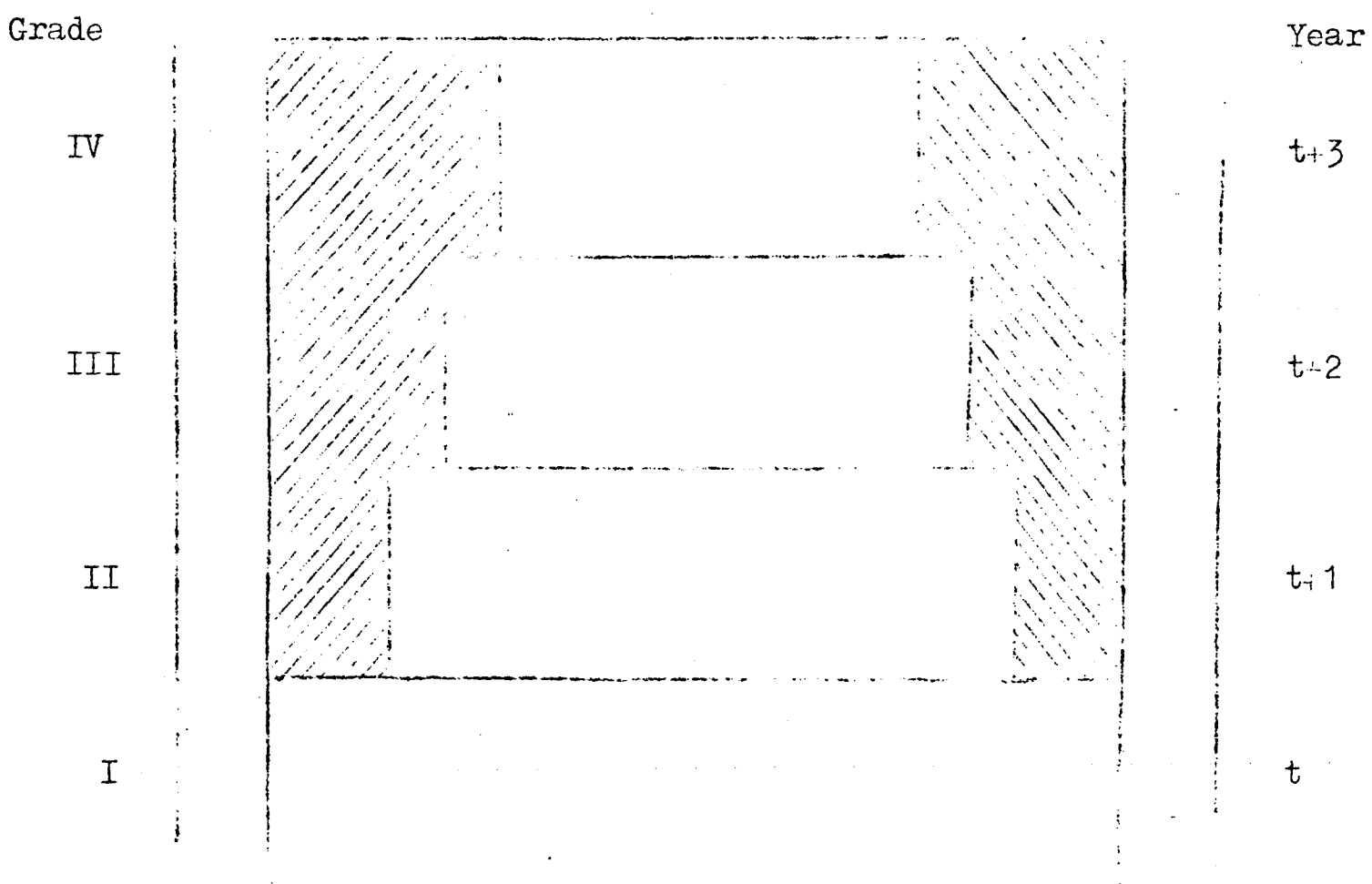


DIAGRAM: IV. ENROLMENT FLOW \*



\* The shaded area represents wastage.

DIAGRAM: V. FLOW OF PUPILS FROM ONE LEVEL TO ANOTHER

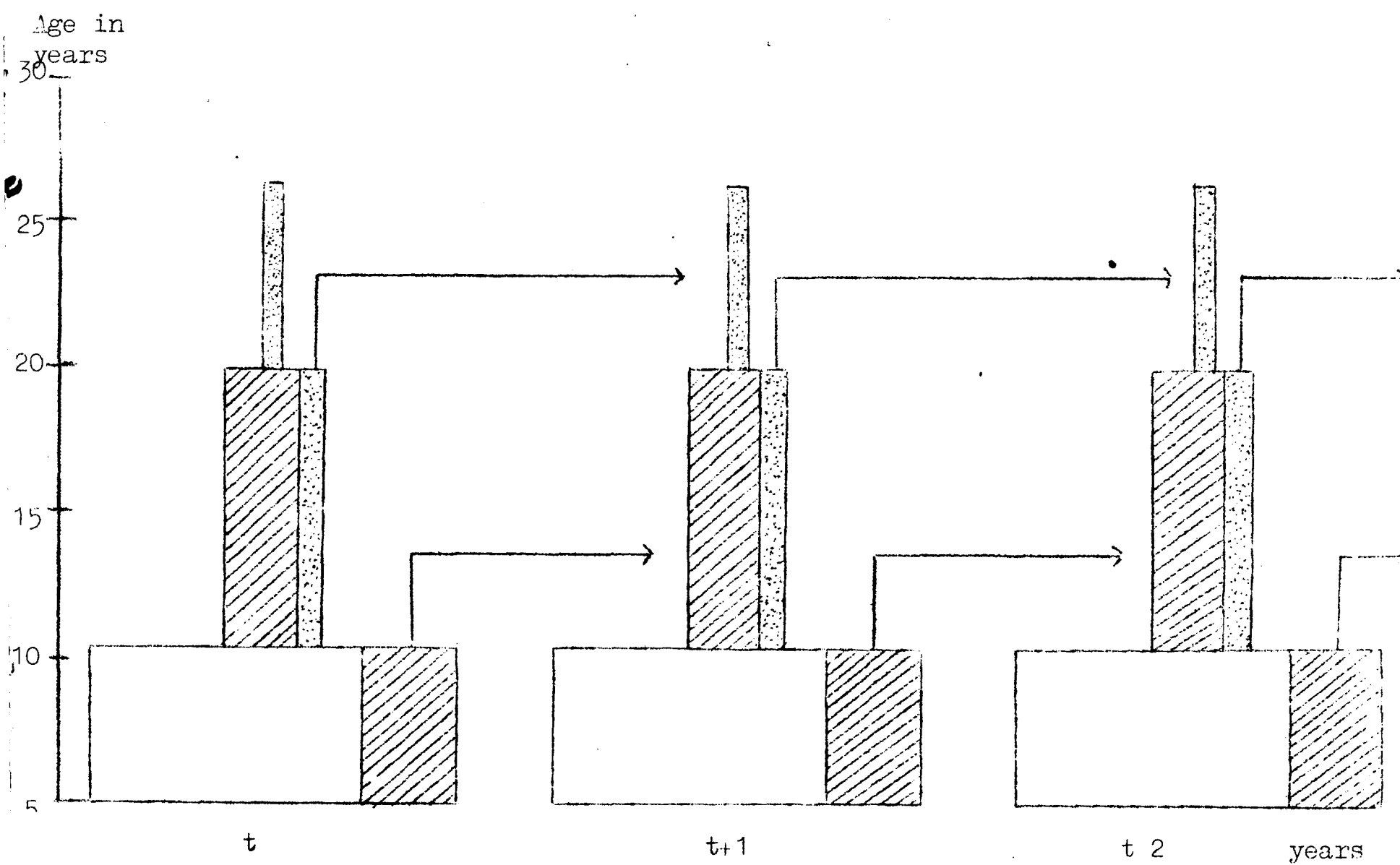
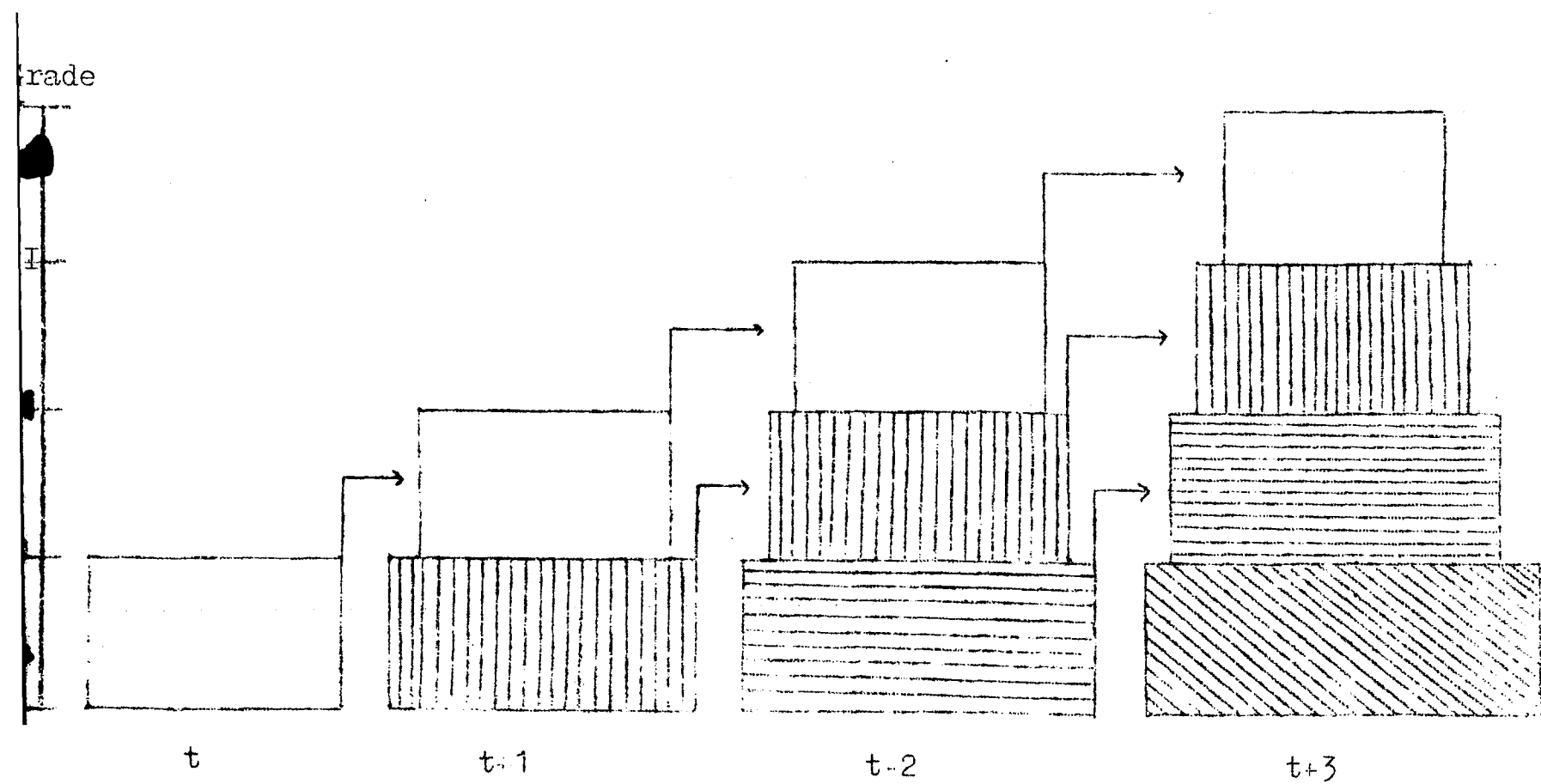


DIAGRAM: VI. EFFECT ON STOCK POSITION OF INCREASING ENTRY IN GRADE I \*



\* No wastage is assumed

Input and output of educational system

The flow diagrams help in understanding the output of the educational system in relation to its input, as regards each level, and for the educational system as a whole. For each level, the input is the number enrolled in grade or class I and the output is the number of successful leavers from the final grade or class of the course either by completing the course or by successfully passing the examination that terminates it (graduates). If no losses have occurred from one grade to another the pyramid becomes a rectangle. The difference between this rectangle and the pyramid recorded shows the wastage that has occurred (Diagram IV ~~VI~~ (23)).

The flows between one level of education and another measure less the efficiency of the educational system and more educational policy, on the parts of the parents in regard to individual pupils, and the State in regard to the numbers who should continue their education.

iii/ Sometimes pictures and maps are used to present statistical data. Pictographs and Statistical Maps This is done with a view to have a better visual effect. Pictures of relevant articles are selected to represent a certain amount of variable under reference and then data relating to different regions are depicted with the help of such pictures. According to the Education Commission of India, the total enrolment in higher education in India was as follows :-

T A B L E VI

Enrolment in Higher Education in India, 1950-51 to 1965-66

<u>Year</u>	<u>Enrolment</u>
1950-51	3 lakhs
1955-56	4 lakhs
1960-61	6 lakhs
1965-66	11 lakhs

Source : Report of education Commission, 1964-65, Govt. of India, Ministry of Education, p. 300.


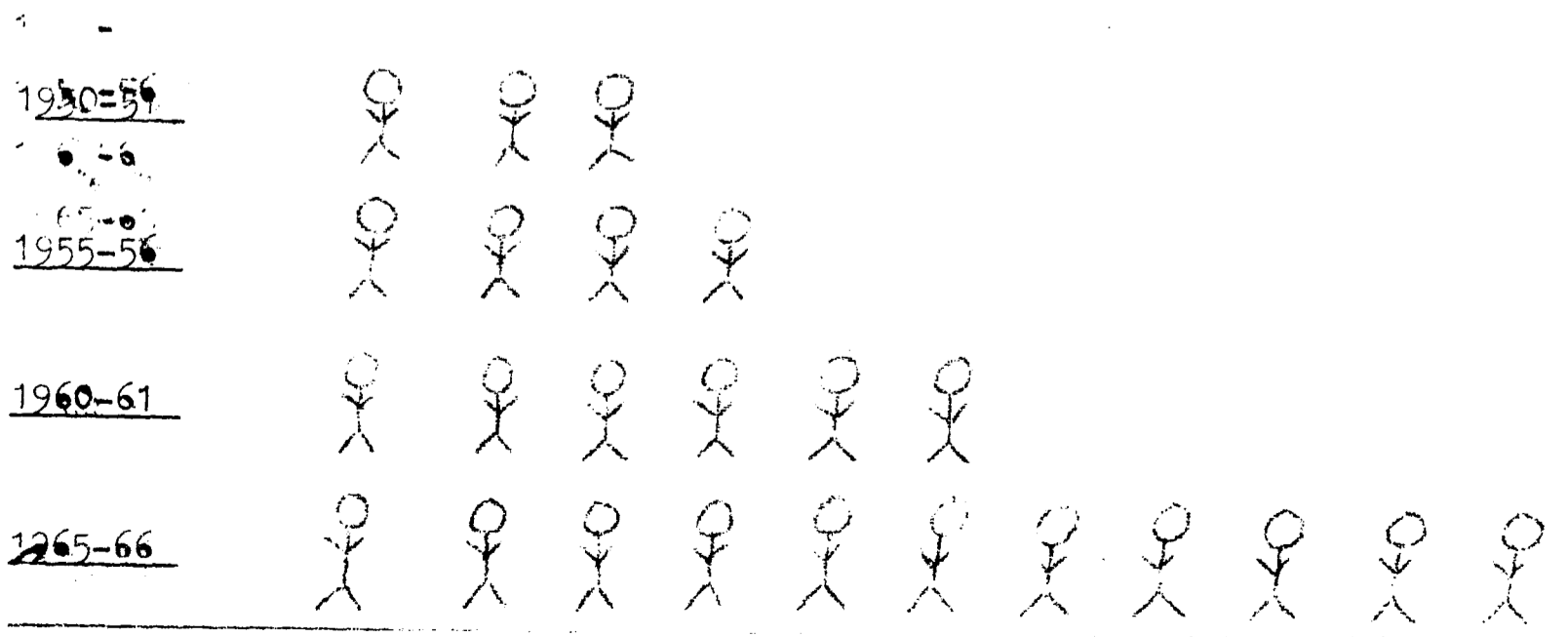
If we now select the symbol  to represent an enrolment of 1 lakh we get the following pictograph to show the progress of enrolment.

Diagram VII

Enrolment in Higher Education in India, 1950-51 to 1965-66



References:

1. F.E. Croxton and D.J. Cowden, Applied General Statistics, 1950
2. W.A. Wallis and H.V. Roberts, Statistics, A New Approach, 1957, London.
3. J.D. Chesswas, Educational Planning of Development in Uganda, I.I.E.P., African Research Monograph 7, 1966

CHAPTER V.

ANALYSIS

The users of statistics are generally interested in getting simplified results rather than in the entire complicated process of statistical operations. It requires the statistical analysis of the data collected and compiled and involves the calculation of averages, dispersion, comparisons, different rates and ratios etc. So this study can be discussed in two parts :-

- a/ Rates, Ratios and Index numbers.
- b/ wastage and other rates.

a/ Rates, Ratios and Index numbers:- A large part of statistical analysis consists in making comparisons. Some comparisons are made by expressing one value as the proportion of another and a great deal of the analysis required in educational statistics depends upon such simple comparisons in the form of rates and ratios.

Following rates and ratios are common to be utilised by the educational statistician to evaluate "stock" and "flow" position of educational system:

Stock ratios

- a/ Sex ratios
- b/ Staffing ratios
- c/ Stock of educated persons
- d/ Index numbers
- e/ Enrolment ratios

Flow Rates

- a/ Entry rates
- b/ Promotion rates
- c/ Dropout rates
- d/ Absentee rates
- e/ Enrolment rates
- f/ Repeater rates
- g/ Wastage rates

i/ Sex ratios:

The following information shows enrolment in successive years in class VIII at primary level :-

Year	Boys	Girls	Sex ratios $\frac{(\text{Col.2}}{\text{Col.3}} \times 100)$
<u>1.</u>	<u>2.</u>	<u>3.</u>	<u>4.</u>
1965	25185	11598	217
1966	25286	12034	210
1967	25689	12178	211
1968	25491	12642	205
1969	16948	13454	200
1970	27452	14034	196

How are the girls progressing compared with the boys ?. One way of answering this question is to express the number of boys enrolled for every 100 girls. If there is equality in enrolment then the sex ratio equals 100. So in column 4 the sex ratios show a considerable preponderance of boys that nevertheless fell during this period just 'over' to just 'under' twice as many girls.

ii/ Staffing ratios:

A useful way of expressing the average work load of teachers, in a particular grade or at a particular level, is to calculate the average number of pupils to each teacher of these grades or in this level. A particular staffing ratio, say 30:1, could be set up as a desirable standard at which educational system should aim. It is one of the simplest indicators to provide

percentage since it suggests the average size of class for the teachers concerned. It is also of use in planning for calculating the demand for teachers when the estimated pupil enrolment is known. The formula for this is :-

$$SR_y^{t.g.} = \frac{E_Y(t-g)}{T_Y(t-g)}$$

where SR = staffing ratio for a particular year, grade and type of education;  
 E = total enrolment in that grade, type of education and year  
 T = total number of teachers for that grade, type of education and year.

iii/ Stock of educational persons:

For the purposes of educational and manpower planning the stock of educational persons is usefully measured as the number of persons per 10,000 population.

iv/ Index numbers:

A useful employment of percentage is to express a series of values as a percentage of one particular value, usually time series with a particular year as base ( that is to say equal 100 ). The enrolment statistics given in the table above ( under sex ratios ) would appear with 1965 = 100, as

Year	Boys	Girls
1965	100	100
1966	100	102
1967	102	105
1968	103	109
1969	107	116
1970	109	121

( Base 1965=100 )

The greater proportional increase in the enrolment of girls is clearly shown.

The series of Index Numbers makes possible comparison between one year and another without the use of plus and minus signs.

If two series are calculated as Index Numbers, for example, school buildings completed and teacher supply, it is also possible to make the comparison independent of the unit concerned, or should the quantities in the two series vary considerably in size, as in the example to show annual changes rather more clearly. The base year in the following series in 1965 = 100.

Year	Teachers	Buildings
1965	100	100
1966	105	96
1967	106	97
1968	107	100
1969	109	106
1970	110	107

(Base year=1965=100)

While selecting the base year, one should be very careful of the importance of his choice and the situation he wished to illustrate. If, instead of 1965, 1966 is used as the base year in the above series the Index Numbers will appear to give a quite different impression.

Year	Teachers	Buildings
1965	95	104
1966	100	100
1967	101	100
1968	102	104
1969	104	110
1970	105	111

(Base year 1966=100)

The interpretation of the two series is :-

i/ since 1965, the teacher supply has increased more than school supply:

ii/ since 1966, teacher supply has increased less than school supply.

v/ Enrolment Ratios and Rates:

Enrolment ratios and rates measure the extent to which the educational system is meeting the needs of the child population. They can be viewed either as a stock measurement- enrolment ratio shows how much education is being provided at a date to which the enrolment refers, or as a flow measurement - enrolment rate shows what proportion of the available children is flowing into the educational system. In the latter use, it will be found that entry rates are even more useful.

a/ Gross enrolment rate (or ratio)

It is ~~the~~ <sup>the</sup> percentage of all ages enrolled in all kinds of schools and is used as a simple general indicator of the amount of education being provided. One figure for all levels of education has in fact little meaning to say for example that 28% of all children are enrolled in schools when in fact this figure is made up of 60% of the appropriate ages enrolled in primary schools, 5% in secondary schools and 2% in higher education ( which could produce 28% of all ages ) is much less information than giving the percentage at each level.

b/ Gross enrolment rate by level of education

To calculate gross enrolment rates by level, it is necessary to have statistics of enrolment by age, to define the appropriate age for the particular level, and to have statistics of the general population at those ages. In developed countries where primary education is legally compulsory at fixed ages, say 6 to 12, there is no problem, the gross enrolment rate at 100% or very nearly so and this has little value as a measure. It is different in developing countries where education may not be compulsory and where due to repeating or other reasons there is a wide age spread, the gross enrolment rate by level has some meaning.

c/ Age specific enrolment rates

The table VI, gives an analysis of enrolment by age and grade. Enrolment for each age, N, is expressed as a percentage of the total numbers in the same age group, P, to give the enrolment rate, n, specific to each age

TABLE: VI  
Enrolment by Age and Grade

Grade \ Age	5	6	7	8	9	10	11	12	13	14	15	Total	Avg. age yrs.
I	10	60	8	3	1	-	-	-	-	-	-	82	6.0
II	-	5	50	8	4	1	1	-	-	-	-	69	7.3
III	-	-	5	40	9	6	1	-	-	-	-	61	8.3
IV	-	-	-	2	35	8	5	1	-	-	-	51	9.4
V	-	-	-	-	1	28	7	1	-	-	-	37	10.2
VI	-	-	-	-	-	1	25	3	1	1	-	31	11.2
VII	-	-	-	-	-	-	1	15	4	2	2	24	12.5
Total <sup>N</sup>	10	55	63	53	50	44	40	20	5	3	2	355	8.5
% Comp- osition	2.8	18.4	17.7	14.9	14.1	12.4	11.3	5.6	1.4	0.8	0.6	100	
Total <sup>P</sup>	109	106	103	101	100	99	98	97	96	95	94	1098	
N% P	I	9.2	61.3	61.2	52.5	50.0	44.4	40.8	20.6	5.2	3.2	2.1	

If these were represented in a histogram it could amount to the more sophisticated ~~form~~ **form** of the educational pyramid.

The crude calculation of the gross enrolment rate is to divide the enrolment at all ages by the population at these ages :

$$\frac{355}{1098} \times 100 = 32 \%$$

It is nevertheless seen from the table that the four extreme rates ( for ages 5,13,14 and 15 ) are all below 10% and thus depress the gross enrolment rate although they together account for only 5-6% of the total enrolment ( see percentage composition row in the table ). It is evident that the age specific enrolment rates ( the educational pyramid ) provide the better description of the stock of education.

d/ Alternatives to the gross enrolment rate

If a simple figure to indicate the extent of enrolment is nevertheless required, a number of alternatives to the crude calculations of a gross enrolment rate can be considered :-

- i/ to neglect the extreme values ;
  - ii/ an average school age enrolment rate ; and
  - iii/ a standard school age enrolment rate
- i/ Neglecting the extreme values : By neglecting the enrolment of those aged 5,13,14 and 15 in the example, the average of the rest may be considered to be more representative. In the above example, the total is 350.5 and out of it the total of extreme values is 9.2+5.2+3.2+2.1= 19.7. By deducting the values of extreme values from the total and deviding it by the average of the rest i.e. 11-4=7 we get  $350.5-19.7 = 330.8 \div 7 = 47.3$ .
- ii/ Average school age enrolment rate: Neglecting the enrolment of some pupils may not be serious where those included represent the substantial majority of the enrolment. Otherwise, a gross enrolment rate should be considered that allows for every pupil. This is the purpose of the average school age enrolment rate. The age span taken against which to measure total enrolment is that between the average age in Grade I and the average in Grade VII . From the end coloum in the table, this age span is seen to be 6 to 12 and the resulting gross enrolment rate :

$$\begin{aligned} \text{Total enrolment (I-VIII classes)(N)} &= 355 \\ \text{Population in the age group 6-12 years} &= 704 \\ \text{Enrolment ratio} &= \frac{355}{704} \times 100 = 50\% \end{aligned}$$

iii) Standard school age enrolment rate:- The third alternative is to examine the position of a standard age group. A suitable group could be that which the government has in mind eventually for primary education. On this basis the standard school age enrolment rate can be calculated to show how far the governments objectives are being met. It is also helpful to give the proportion of all enrolment represented by these in the standard school age-group. To give an example, if the objective of government policy is primary education for all aged 6 to 12, the information in the table shows :-

- i/ those enrolled aged 6-12 to be  $\frac{355}{704}$  or 94% of all pupils enrolled; and
- ii/ their standard school age enrolment rate ( the average of the age specific rates ) to be

$$\frac{330.8}{7} = 47.3 \%$$

A related measure is to show how far the policy for each pupil of successive years in successive grades is being achieved, the number of 6 year olds, in the example, that are in Grade I, 7 year old in Grade II and so on. These are the numbers within the diagonal lines in the table and their age specific enrolment

for  $\frac{255}{355}$  or 71 % of all pupils and their gross enrolment rate is 35.6 per cent.

e/ Estimating gross enrolment rate : In the absence of satisfactory information on ages, the following calculations will provide an approximate rate. The average age of each grade would be assessed either directly by the teacher or headmaster, or from general knowledge for example by assuming that Grade I has an average of 6, Grade II of 7, and so on. The age of the most numerous grade is then selected and the total age span also noted. The estimated gross enrolment rate is then

$$\frac{N}{P_a} \times \frac{100}{A}$$

where

- N = total enrolment
- a = most numerous age
- Pa = the total population at this age
- A = age span

On the assumption that successive grades in the table have successive average ages, the use of this formula gives the following results which may be compared with the actual figures above :

- for an 11 year span 30%
- for a 7 year span 48%

Gross enrolment rates should be shown as rounded whole numbers where they are only approximate and close comparisons, for example between year and another should not be pressed.

vi/ Entry rates: Of greater interest than the total enrolment at any particular time, is the movement into the educational system and the movement within it. The movement into the educational system is measured by entry rates.

**Entry** rates measure the flow into each level of education at the primary level from children arriving at school age, and at higher levels from successful leavers at the preceding level. They are defined as the initial enrolment or enrolment in the first grade in primary or secondary schools expressed as a percentage of those available for entry.

As a measure of the extent to which effective provision is being made for education, particularly at second and third levels, entry rates are of considerable value. They are also basic information for the purpose of forecasting.

Entry rates can be studied at three levels of education :

- a/ entry rate for first level of education
- b/ entry rate for second level of education
- c/ entry rate for third level of education

a/ For first level of education :- Where education is compulsory after a certain age (say 6) the entry rate is the same as the age specific rate for the six years olds since those entering are all aged 6 and the available population are all those aged 6. In both the instances the rate is 100 per cent. Where those who enter are of mixed ages, and where there is also repetition, the two rates diverge. Whereas the enrolment rate shows all those of a particular age who are enrolled in whatever grade, the entry rate shows all those enrolled in the first grade at whatever age, as a percentage of all those available at whatever age for entry. Defining 'those available' in this connection leads to difficulty in a developing country.

The entry rate can be considered as the average of the age specific enrolment rates of those in Grade I. Using the same figures as in the table we have the following :

	Age: 5	6	7	8	9	Total
Enrolment in Grade I (E)	10	60	8	3	1	82
P	109	106	103	101	100	
<u>E</u>						



$$\text{Average} = \frac{77.6}{5} \times \frac{100}{1} = 15.5 \%$$

Using the short method the most numerous age is 6 to give

$$\frac{82}{100} \times \frac{100}{5} = 15.5\%$$

In this calculation weight has been given to extreme values. Since the major entry is at age 6 the calculation could be limited to the enrolment at this age to give an entry rate of 57%, on the part of 73% of all entrants.

Neither approach is completely satisfactory. The second will probably be found to be more useful. As government policy is realised, this particular entry rate will come to be that of a growing proportion of all new entrants so that the two percentages will give a good indication of trends.

which is a For second level education: More satisfactory rates can be calculated for the flow into education at this stage / point of extreme interest to the educator especially in developing countries. On the flow into secondary education depends the future of the educational system itself ( the supply of teachers ) as well as the manning of the economy generally. Entry rates at the primary stage are largely a matter of the provision of places. At the second level entry is limited by the considerable cost of the provision of places on the one hand, on the other, the quality of those available, that is, the numbers in the previous school year of successful leavers from primary education.

The number of successful leavers is known from examination or other records and the number subsequently enrolling in the secondary schools can be expressed as a percentage of the successful leavers. It is assumed that there is no delay in leaving one school year and entering the secondary school at the next school year. If regional entry rates are calculated adjustments will have to be made for pupils transferring to or from another region

As with other flow rates, entry rates are often more informative when set results from working of a number of factors and the flow can be considered at a number of points during the period of change from one level to another. From among those enrolled in the final primary grade, where success at examinations determines the next stage, some will be candidates for these examinations of whom only a proportion will be successful. Thus a number of rates emerge :-

- a/ percentage of those enrolled in the final year who complete the course;
- b/ percentage of those completing the course who take the examinations;
- c/ the percentage of those taking the examination who are successful
- d/ the percentage of those successful in the examination who enrol in secondary schools, which is the entry rate for second level education.

approaches  
Where ( ) 100% it is possible to proceed by first calculating the percentage of those enrolled in the final year who take the examination. For some purposes the "successful leaver" may be expressed as percentage of those enrolled, the rate of successful candidates to all taking the examinations being used separately in discussing the examination results as such.

For third level education: At this level the number available for entry are those successful leavers who have passed leaving examination at the minimum level required by the institution of higher education. Since these qualifications may be obtained after the pupils have left the secondary school and since some successful leavers may delay their entry into higher education for one or more years, the number available in any one year will consist of :

- a/ those qualified at the end of the school year;
- b/ minus those who postponed applying for higher education for one, two or three years etc. ,
- c/ plus those from previous scholastic years who postponed applying

Items (b) and (c) balance off against each other to some extent. If the assumption is made, where there is no detailed information about intensions, for example of successful leavers that similar numbers decide to defer their entry each year, these items balance more or less completely out. It then remains to obtain (d). This information is given by the examination results of the institutions of further education and similar assumption may be made about the deferment of actual application by those successful at these examinations.

Additional rates which will be found of interest are :

- a/ The application rate :- The proportion of school leavers at the appropriate level of qualification to apply for higher education.
- b/ Degree of competition The proportion of each group of applicants admitted.  
The number of those entering third level education may be considered separately as initial entrants to
  - i/ teacher training colleges ,
  - ii/ to further education ; and
  - iii/ to universities

For describing third level education as a whole these separate totals can be aggregated after making allowances for double counting. There is a danger of double counting where those entering, say, a particular university may include some who have already entered higher education elsewhere.

vii/ Wastage and other rates

Entry rates measure the rates of flow into levels of education, other rates are required to measure the flow between grades-this is the problem of wastage.

- a/ Crude promotion rates :- Without repeating and wastage of any kind the numbers enrolled in a particular year (Y) in a particular grade (g) i.e.  $(N_y^g)$  will be the same as those enrolled in the following grade in the following year  $(N_{y+1}^{g+1})$ . If the number promoted at the end of the first year is represented by (S) then :

$$S_y^g = N_y^g = N_{y+1}^{g+1}$$

will be

and the crude promotion rate (s) defined as the number promoted as a percentage of the number enrolled :

$$\text{Crude } s_y^g = \frac{N_{y+1}^{g+1}}{N_y^g} = 100 \%$$

In fact, in developing countries these rates, based on the straight comparison of successive enrolments, show a position similar to the following. The figures in circles are the percentage comparisons between the enrolment figures booked by the arrows; they are crude promotion rates for successive grades in successive years. The diagrams thus represent the different cohorts of pupils:

T A B L E : VII

Grade	1962	%	1963	%	1964	%	1965	%	1966
I	50	→76	54	→78	58	→75	61	→81	63
II	34	→79	38	→80	42	→81	46	→83	49
III	24	→88	27	→89	30	→90	34	→91	38
IV	18	→95	21	→95	24	→95	27	→95	31
V	15	→95	17	→95	20	→95	23	→95	26

Movement of Cohort at Primary Stage.

b/ Crude wastage rates:

The number of those who fail to be promoted provides a crude measure of the amount of wastage. The crude wastage rate is thus the residual of the crude promotion rate, that is 100-(s) per cent. Distinction can be made between the grade-to-grade wastage rate and the cohort or gross wastage rate. The gross wastage rate refers to the loss occurring between the first and final grades as a cohort passes through a particular level of education. In the above example, enrolment in grade V in 1966 ( N<sub>66</sub><sup>5</sup> ) is 26, and in grade I in 1962 ( N<sub>62</sub><sup>1</sup> ) is 50, so that the crude gross wastage rate for this cohort is the difference expressed as a percentage of the initial enrolment or

$$\frac{N_{62}^1 - N_{66}^5}{N_{62}^1} \times \frac{100}{1} = \frac{24}{50} \times 100 = 48\%$$

A series of such rates gives a rough idea of the extent to which wastage is diminishing. It is a crude measure since no allowance is made for the extent of repeating; if this is large, the crude wastage rate can be very misleading. In this event drop-out must be distinguished from repeating.

Some times gross wastage can be usefully looked at from the angle of the average years of study required to produce a successful leaver, if there were no wastage and all candidates were successful at examination this average number of years would be the length of the course. The extent to which this number is exceeded in practice measures the general wastage. A cohort of children passing through the course is taken and the number enrolled in each successive year added to obtain the total number of years spent by all pupils in the cohort during the course. If this figure is compared with the total number of those who successfully complete the course (G), either by passing an examination or being promoted to a further grade, an indicator is obtained in the form of the average number of school years required for that cohort to achieve a single successful leaver:

$$\text{average} = \frac{N_0^1 + N_1^2 + N_2^3 + \dots \dots \dots \text{etc.}}{G}$$

If the calculation is made for successive cohorts a series such as the following is obtained:-

<u>Average number of years per successful leaver</u>			
<u>Cohort 1957</u>	<u>Cohort 1958</u>	<u>Cohort 1959</u>	<u>Cohort 1960</u>
5.1	4.8	4.6	4.2

This suggests increasing efficiency of the educational system and is useful for planning.

c/ Repeater Rate: As a first approximation, the repeater rate can be defined as the number who repeat a grade ( R<sup>G</sup> ) in the succeeding year ( Y+1 ) as a percentage of the original enrolment ( N<sub>y</sub><sup>G</sup> )

$$r_{y+1}^G = \frac{R_{y+1}^G}{N_y^G} \times 100$$

d/ Drop-out rate: If the number promoted and the number who repeat are known, the number dropping out ( D ) can also be known;

Since  $N_y^G = R_{y+1}^G + S_y^G + D_y^G$   
 and  $D_y^G = N_y^G - R_{y+1}^G - S_y^G$

If the annual questionnaire provides only enrolment for each grade and the number repeating, the number promoted ( S<sub>y</sub><sup>G</sup> ) can be number-derived from the fact that the initial enrolment ( N<sub>y</sub><sup>G</sup> ) is equal to the number of those who are promoted plus the number who repeat plus the number who drop out.

repeating the same grade. Thus

$$N_{y+1}^{g+1} = S_y^g + R_{y+1}^{g+1}$$

or

$$S_y^g = N_{y+1}^{g+1} - R_{y+1}^{g+1}$$

so that the number dropping out in the previous grade can be found by

$$D_y^g = N_y^g - R_{y+1}^g (N_{y+1}^{g+1} - R_{y+1}^{g+1})$$

which is better expressed as:

$$D_y^g = N_y^g - N_{y+1}^{g+1} + R_{y+1}^g + R_{y+1}^{g+1}$$

The drop-out rate between one grade and the next is given by the drop-out as a percentage of the initial enrolment :

$$d_y^g = \frac{D_y^g}{N_y^g} \times 100$$

where drop-out = 0 the rate is 0 percent. A high drop-out means a high percentage.

An adjustment for transfers between one school and another is further necessary where drop-out rates for individual schools or for regions are being calculated. In the national rate, transfers from one school to another balance out, but an individual school or region may receive more scholars than it loses, or lose more than it receives, giving it a net balance or net loss of transfers (Q). Transfer balances must be deducted or transfer losses added to initial enrolment before the drop-out is calculated. The drop-out is then given by

$$D_y^g = N_y^g - N_{y+1}^{g+1} - R_{y+1}^g + R_{y+1}^{g+1} \pm Q_y^g$$

strictly speaking an adjustment for deaths is also necessary, the number ( $M_y^g$ ) being also deducted from enrolment before drop-out is calculated. The omission of this adjustment is not very serious since the effect may be small compared with the factors concerned and calculation of the drop-out unadjusted for deaths should not be held up if mortality statistics are not forthcoming.

Timing and the calculations of drop-out:

Ideally, the calculation should take place on the first day of the school year, taking into account all transfers (and deaths) occurring during the previous twelve months. In practice, the enrolment is not recorded for the statistician until the date of the annual questionnaire, and the figures will, as a result already have allowed for transfers and deaths since the beginning of the new school year. The enrolment figures for the previous year will have also been distorted for the same reason. The simplest course, when comparing the two enrolment figures to calculate the drop-out, is to assume that the distortion is proportionally the same each year and to neglect it. The alternative would be either to adjust all enrolment figures back to the first day of the school year, or to use a transfer (and mortality) figures related strictly to the twelve months preceding the date of the annual questionnaire. This could be troublesome, and the result would include as drop-out pupils who may be temporarily absent at the beginning of the school year.

e/ Promotion rate further considered:- With information on repeating, it is possible to move away from the crude promotion rate, in view of the fact that number promoted from:

$$N_y^g = N_{y+1}^{g+1} - R_{y+1}^{g+1}$$

A better version of the promotion rate is thus:

$$S_y^g = \frac{N_{y+1}^{g+1} - R_{y+1}^{g+1}}{N_y^g}$$

Although this rate could be used for most purposes, it could be refined further; particularly for use in forecasting. Thus, as it stands for a particular school or region, it assumes that any net loss by way of transfers will be reckoned as pupils who are not promoted, which is not necessarily true. To remedy this, enrolment could first be adjusted by transfers, and, where possible, deaths.

It may also be considered that dropout is a kind of mortality: pupils are lost, in this way, to the school population. If the initial enrolment in a grade can be considered as a population that losses (or gains) by way of transfers, deaths, and drop-outs during its life of one school year, at the end a number available for promotion will remain. These will either be promoted or repeat, and a strict definition of promotion rate (and equally of repeater rate) would be the number promoted (or repeating) as a percentage of those available for promotions, that is in individual schools or regions.

$$s_y^g = \frac{S_y^g}{N_y^g \pm Q_y^g - M_y^g - D_y^g - R_{y+1}^g}$$

f/ Absenteeism and attendance rates: - The drop-cut rate shows, in effect, absenteeism in its extreme form. A measure of general absenteeism is also necessary if the evaluation of the educational system especially in regard to regional differences is to be complete. This measure is derived from attendance statistics. The drop-cut rate is measured by reference to a particular date. Attendance has to be measured as an activity extending through the school year.

The monthly return shows the number attending each session, with weekly and monthly totals, and the number of pupils enrolled. From this information certain rates can be calculated:-

- i/ the sessional attendance rate:- The average monthly attendance of all pupils at each session gives a general idea of the extent to which class facilities are being used;
- ii/ pupil attendance rate:- The average monthly attendance by each pupil as a percentage of the total possible to give a general idea of how much education pupils are receiving;
- iii/ absenteeism rates are the reciprocal of pupil attendance rates, in averaging pupil absences, they indicate directly the extent of this problem.

All these rates when presented as a monthly or even a weekly time series can be very illuminating.

A more exhaustive examination of the problem of absenteeism requires an analysis of the dispersion of pupil attendance rates around the average and this would entail grouping these rates into a frequency distribution for subsequent calculation of the inter-quartile range and other measures. Thus, detailed work practically, should be limited to a selected area or range of pupils or a special inquiry which may also include pupil's home backgrounds and information about causes of absenteeism. It would be necessary to carry out the survey for a sufficient length of time to cover the seasonal as well as the monthly or daily variations in attendance.

Note:(to Chapter V )

Following is a standard system of notation, for use in educational statistics based upon UNESCO publication 'Statistics in Developing Countries' which may be recommended for national use.

P = Number in the age group  
N = Enrolment number  
n = Enrolment rate  
E = Entry number  
e = Entry rate  
G = Successful leaves  
R = Repeating number  
r = Repeating rate  
Q = Net transfers  
M = Death numbers  
m = Death rate  
D = Drop-out numbers  
d = Drop-out rate  
S = Number promoted  
s = Promotion rate  
g = Grade (super-script)  
y = Year. (sub-script)

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References

1. W.L.Kendall, Statistics of Education in Developing Countries, Statistical Reports and Studies, U.N.E.S.C.O., 1968.
2. N. Bodark, " Problems of Measuring Educational Yield in order to Assess Educational Productivity". Discussion paper. I.I.E.P., U.N.E.S.C.O., Paris, 1965.
3. Croxton and Cowden, Applied General Statistics, (2nd Ed). Prentice Hall, New Delhi.
4. A.K.Kamat, Mathematical schemes for describing progress of Education in course of Education, Sankhya, series.B, 30, Calcutta, 1968.
5. J.D.Chesswas, Methodologies of Educational Planning for Developing countries (two volumes), U.N.E.S.C.O., Paris, 1969.

E D U C A T I O N A L      S T A T I S T I C S  
A N D  
P L A N N I N G

VI. Statistics needed for Educational Planning	47
VII. Enrolment Projections	50
VIII. Teacher Projections	64
IX. Classroom Projections	67
X. Costs and Outlay Projections	63

## STATISTICS NEEDED FOR EDUCATIONAL PLANNING

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The main purpose of educational planning is to provide gradually, within resources available, adequate educational facilities to meet the needs - economic, cultural and social, of the country. The importance of comprehensive statistics for efficient educational planning and their timely availability hardly needs to be emphasized.

It is, however, difficult to generalise about data " needed " for the educational planning if only because of wide variations in different countries in the degree of development of educational facilities and shifting of emphasis from one aspect of education to another as development progress. When deciding about data to collect, it would be short sighted to collect only data needed for immediate future. Educational planning and development are continuous processes and study and entrapolation of past trends are an essential part of the planning process. At the same time line has to be drawn between what is essential and what is desirable because the collection and processing of statistics consumes time and money and trained statistician are usually short in supply. The choice of the basic information and the use made of it, is therefore finally a matter of judgement in each particular case, taking into consideration the scope and the specific objectives of the planning activity in question.

Type of data needed:

Regarding the different types of statistics included, there is a principal distinction between those belonging to

- a/ Educational Statistics e.g. educational institutions, teachers, classes, pupils, school buildings, educational testing and vocational guidance, cost of education.
- b/ Other fields of statistics e.g. demographic statistics, labour force statistics, economic and financial statistics

However, for description purposes, we may classify the data needed under following four main heads :-

- a/ Demographic Statistics
- b/ Manpower Statistics
- c/ Socio-economic Statistics
- d/ Educational Statistics

a/ Demographic Statistics

- i/ Population by sex, age, region and economic levels
- ii/ Birth, death and migration rates
- iii/ Population projections by administrative divisions, sex, age, region and economic levels.



b/ Manpower Statistics

- i/ Population of working age by different age-groups
- ii/ Labour force by industry and educational levels
- iii/ Replacement rate by industries and educational levels
- iv/ Projections of labour force

c/ Socio-Economic Statistics

- i/ Rate of development and indices of economic growth
- ii/ Economic plans for different sectors
- iii/ Capital-labour ratio for different industries
- iv/ Total public expenditure by sectors and purpose
- v/ Total revenue by source

d/ Educational Statistics

- i/ Institutions by level and type of education, management, location, sex characteristics, courses offered and enrolment;
- ii/ Enrolment by grades and courses, sex and age of students;
- iii/ Employees :
  - Teaching staff, by age, sex, qualification and salary
  - Replacement rate of teachers
  - Supervisory and inspectorial staff
  - Other staff
- iv/ Buildings :
  - Details about built-in-area
  - Area under different uses
  - Hostel area
  - Utilisation of classrooms, laboratories and other areas
  - Utilisation of equipment
- v/ Examinations :
  - Percentage of passes by grades and courses
  - Stagnation and wastage at different stages
- vi/ Expenditure by purpose :
  - Recurring
  - Non-recurring
  - Debt services
- vii/ Educational receipts by sources
- viii/ Out of school education - adult education, correspondence courses, in-service and on the job training etc.
- ix/ Statistics on improvement of education.

The above inventory lists out the items on which statistics are needed by an educational planner. What should be the details and break-up will depend upon a particular situation. If there are regional variations, one has to get statistics about different regions-tribal areas as against other areas, industrial as compared to rural areas etc. short term and long term plans, similarly, call for different details. Short term plans can be prepared with greater accuracy and precision, while long term plans are more subject to guess work and uncertainties. Hence, for short term educational plans/will be based on reasonable and general assumptions as to the future educational, socio-economic and political trends of the country.

As far as specialised education dealing with a particular type of level on a particular region of the country is concerned one requires a deeper and more intensive study of that particular aspect for which an educational plan is being prepared. Depending on the situation in which

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ucational plan

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an educational planner is placed, he has to decide his own detailed programme but certainly, as a first step, he should provide himself with as much statistics on the items listed above as are easily available and then try to assess his future requirements and proceed accordingly.

References:-----

1. K. G. Brolin, Statistics Needed for Educational Planning, Chapter X in "Economics & Social Aspects of Educational Planning", UNESCO, 1963, Paris, pp 228.
2. John D. Chesswar, 'The Basic Data Needed for Educational Planning', Chapter in World Year Book of Education (Educational Planning), 1967, Evan Brothers.
3. Dr. G. P. Khare, Statistical Needs of Educational Planners, Chapter 7, 'Introduction to Educational Planning', Asian Institute of Educational Planning and Administration, 1968, New Delhi, pp.69.
4. Q. U. Khan, 'Statistics for Educational Planning', Manpower Journal, Vol-IV, No. 3, Oct.-Dec. 1968, I.A.M.R. New Delhi, pp 41.
5. Education Division, Planning Commission, 'Selected Educational and Related Statistics at a Glance' (Plan and Non-Plan), 1969, New Delhi.

## CHAPTER VII

### E N R O L M E N T

#### Projection, prediction and forecasting

The term best suited to describe the forecasting of future enrolments is "projection". It is now commonly used by the United Nations Population Division. The term "prediction" should be as far as possible avoided because it presumes too much: it implies that a statement made on future enrolment does not admit of possible variations of the actual number that will be found at that future date. The term "forecasting" on the other hand appears to be less precise than the term projection as regards the assumptions on which a statement made on future enrolment has been based. Nevertheless it seems worthwhile, as a matter of communication, to establish connotation in which the words "estimates" and "projection" may be used. The person who makes such projections may be referred to as "forecaster".

#### Factors determining the growth of school enrolment:

There are two major factors which basically determine the size of the future school-going population :-

Demographic: The expected growth of population or more precisely of the school age population;

Educational: The anticipated expansion of the school system which may result from other developments than the mere growth of the population.

In other words we can say that it is the absorption by the school system of children who at one time would not have attended school. This happens in various circumstances;

- i/ Implementation of a system of compulsory education; *and*
- ii/ Another instance of this kind occurs where the age range is an open-ended one i.e. where there is tendency for the age range of children actually attending school to expand.

Process of: The process of projection may be divided in two parts :-

- a/ Studying the past trend; and
- b/ to make projection for future.

#### a/ Studying the past trend

The projections are the result of observation of the factors that in the past have contributed to changes in enrolment, such as:-

- i/ increase or decrease in the population groups of school age;
- ii/ changes in the rate of enrolment or attendance of certain age-groups both outside and within the ages of compulsory education;
- iii/ the pattern of enrolment of boys against girls,
- iv/ the pattern of classification by grades;
- v/ and the reasons for its change;
- vi/ the proportion of pupils that reach stated levels

The behaviour of contributory factors can be studied for past years by suitable method of analysing total enrolment. If the observation can be made for a sufficiently long period, they will reveal trends of increase or decline. It becomes possible then to express the expectations as to how and at what rate these trends continue to operate on stated assumption that can be assigned numerical values so, there, are two steps under it.

i/ Making these assumptions involves in the first instance making a decision. It will be a difficult one but it is always a necessary step in projection work. The more we know about the trends in the past from an analysis of available information, and the closer the projection work is geared to the general administration of the education system, the easier this work will be.

ii/ The next step is that of assigning numerical value to the expectations of change based on stated assumptions so that they can be entered as factors in the computation of future enrolment.

b/ Making projection for future:

Enrolment projections may be :-

- i/ Short-term
- ii/ Medium-term ; and
- iii/ Long-term

The desirable period of time for which such estimates should be made depends in part on the use to be made of the estimates:

- If enrolment estimates are needed for the sole purpose of preparing an annual budget of expenditure for the school system it is probably enough to make annual estimates of enrolment one or two years advance.
- If a school building programme is under consideration which would be spread over a period of few years, then estimates of school enrolment must be prepared for several years ahead.
- If the question under consideration has to do with the training of teachers and related professional workers, then the period of time covered by estimates must be at least as long as it takes to complete the training of one group of such workers.
- If, however, it is question of re-organisation of entire system of education, involving every level and type of education, it would seem advisable to draw up estimates of future enrolment for at least 10 to 15 years - about the length of time it takes for a pupil to progress through the school system.

be

The length of time to covered by enrolment estimates is also related to the amount and recency of basic data available to the estimator. If the available data is reliable and comprehensive it would not be difficult to attempt relatively long period estimates. As against this if the basic data are incomplete or out of date, we must of course resort to making various adjustments and assumptions, whose validity may become questionable even over a relatively short period of time.

One important safeguard of a long term estimation of future enrolment should be a built-in-feature of frequent revisions so as to reduce margin of error by modifying the original assumption in the light of later observations.

Basic methods of projections:

There are following two basic approaches for enrolment projections :-

- a/ Grade-Cohort method; and
- b/ Enrolment ratio method.

a/ Grade-Cohort Method:

This method is primarily based on the level of current school enrolment and estimated ratios, intake, retention and output of the school system. This method is possible only when we have fairly complete and detailed school enrolment data by sex and grade, for a sufficient number of years. The number of years covered by these data should be at least equal to the number of grades, at each level of education, preferably several years more. If, in addition, we have data on promotions, drop-outs and repeaters for each grade, also for a sufficient number of years it would greatly facilitate our work by use of this method.

This method has two approaches :-

- i/ School survival ratio-approach;
- ii/ ~~Crude~~ promotion rate - approach

ii) School-survival ratio approach:

The first approach will be clear by the following schedule of operations :-

T A B L E : VIII

SCHOOL SURVIVAL RATIOS

Schedule :

I.	CI	CII	CIII	CIV	CV	CVI	CVII	CVIII
in	Y <sub>0</sub>	Y <sub>+1</sub>	Y <sub>+2</sub>	Y <sub>+3</sub>	Y <sub>+4</sub>	Y <sub>+5</sub>	Y <sub>+6</sub>	Y <sub>+7</sub>

II. Base Years

Simplified classification in:

CI	CII	CIII	CIV	CV	CVI	CVII	CVIII
1958	1959	1960	1961	1962	1963	1964	1965
1959	1960	1961	1962	1963	1964	1965	1966
1960	1961	1962	1963	1964	1965	1966	1967
1961	1962	1963	1964	1965	1966	1967	1968
1962	1963	1964	1965	1966	1967	1968	1969

III. Survival to by ratios:

CII	CIII	CIV	CV	CVI	CVII	CVIII
II. I.58	III.60 I.58	IV.61 I.58	V.62 I.58	VI.63 I.58	VII.64 I.58	VIII.65 I.58
II.60 I.59	III.61 I.59	IV.62 I.59	V.63 I.59	VI.64 I.59	VII.65 I.59	VIII.66 I.59
II.61 I.60	III.62 I.60	IV.63 I.60	V.64 I.60	VI.65 I.60	VII.66 I.60	VIII.67 I.60

IV. Rolls  
(denominators)

<u>CI</u> Y <sub>0</sub>	<u>CII</u> Y <sub>+1</sub>	<u>CIII</u> Y <sub>+2</sub>	<u>CIV</u> Y <sub>+3</sub>	<u>CV</u> Y <sub>+4</sub>	<u>CVI</u> Y <sub>+5</sub>	<u>CVII</u> Y <sub>+6</sub>	<u>CVIII</u> Y <sub>+7</sub>
2130	1223	948	724	519	329	287	243
2185	1303	958	669	549	361	329	276
2223	1285	1015	809	581	421	359	309
2373	1393	1082	871	664	458	405	331
2620	1515	1188	957	722	526	444	392

V. Survival Ratios : ( Multiplied by 100 )

<u>CI to CII</u>	<u>CIII</u>	<u>CIV</u>	<u>CV</u>	<u>CVI</u>	<u>CVII</u>	<u>CVIII</u>
1958 57.4	44.3	34.0	24.4	15.4	13.5	11.4
1959 59.6	43.9	35.2	25.1	16.5	15.0	12.6
1960 57.8	45.6	36.3	26.1	18.9	16.1	13.9
1961 58.7	45.6	36.7	28.0	19.3	17.1	13.9
1962 57.8	45.4	36.5	27.6	20.1	16.9	15.0

Steps:

- Ist phase : sets out accordingly a detailed schedule of working. In the following steps this step has been simplified by taking only primary stage i.e. from Class I to Class VIII from year Y<sub>0</sub> to Y<sub>7</sub>.
- IIInd phase : notes the reference years of survival within a series of base years.
- IIIrd phase: shows the ratios specific for these years where Class I enrolment is used as denominator and the forms to which pupils progress as numerator.
- IVth phase : substitutes the actual enrolment records of the <sup>base</sup> years.
- V phase : tabulates the survival ratios.

A more complex pattern results when proportions of pupils repeat a given class. More elaborate study in this phenomena has been made by Mr. B. A. Lin in his " Estimating future school enrolment in developing countries " published by Unesco, Paris in 1966.

After having above calculations, the survival ratios are used for projection purposes. Survival ratios can be projected for future either by plotting on the graph or with the help of method of least squares. The estimate of the future trend rests upon the assumptions of linear development. This process is sometimes called " extrapolation".

This method of class survival ratios is of material assistance in giving a picture of probable staffing and equipment needs of schools.

ii/ Crude Promotion rates approach

It is just other form of the Ist approach where class Ist enrolment is not/<sup>taken</sup> as denominator for all successive classes but ratios only between two successive classes are taken into account. In such cases enrolment for grade first is to be projected for future either with the help of method of least squares or by plotting on the graph. In the following example, enrolment for 1966 could be projected forward by applying the estimated rates



TABLE IX (c)

Grade	1962	%	63	%	64	%	65	%	66	%	67	%	68	%	69	%	70	%	71
I	50		54		58		61		63		(65)		(66)		(67)		(68)		(69)
			76		78		79		81		82		84		85		86		87
II	34		38		42		46		49		52		55		56		58		59
			79		80		81		83		84		85		86		87		89
III	24		27		30		34		38		41		44		47		49		52
			88		89		90		91		92		93		95		95		95
IV	18		21		24		27		31		35		38		42		45		47
			95		95		95		95		95		95		95		95		95
V	15		17		20		23		26		29		33		39		40		45
Total enrolment		141	157	174	191	207	222	236	248	260	270								

The first method has the advantages that only the most recent information is used and that good statistics for two years only are required, a consideration which may be of weight when past statistics are of a dubious character and their quality has only recently been improved. The results shown by this method in Table (B) are with the estimated entry in brackets.



The disadvantages of this method are first, that the rates refer to the experience of different cohorts, the promotions rate from Grade I to Grade II in the example reflecting the experience of those who entered in 1966, the rate from Grade II to Grade III reflecting the experience of those who entered in 1965 and so on backwards through the years. Secondly, there is the assumption, which is also shared by the second method, that the promotion rates will not improve during the period under forecast. It may be possible where the enrolment is fairly stable, but in rapidly developing countries where the education system is developing at a light rate—there one cohort's experience may not be precisely substituted for that of another.

The second method attempts greater consistency by drawing upon the promotion rates of a single cohort, to give the results given in the example in Table (B).

The disadvantages of this method are first, that it draws upon statistical data that are up to five year old and secondly that it does not allow for any possible improvement in promotion rates, both important weaknesses in the method when applied to a rapidly expanding educational system.

The third method seeks to remedy these weaknesses where suitable statistics are available, making possible the calculations of promotion rates for at least three years—but preferably for at least five years — the rates for each grade so calculated, can be plotted on a graph and by means of a straight line projection, the estimated value of these rates found for the ensuing five years. The results given by this method are shown in the example in Table (C).

Care has to be exercised in making forecasts of this kind particularly where the recorded promotion rates are high since, the closer the promotion rates are to 100 percent, the less a straight line describes the trend. Thus a straight line projection of the three rates 94 percent, 95 percent and 96 percent would show rates above 100 percent in four years' and five years' time and the trend at 95 percent or at the best recorded level above 90, whichever is higher.

B. The enrolment Ratio method:

This method based essentially on the projection into the future of past and current ratios of school enrolment or of school attendance, requires estimates of population by age and sex, and either school attendance data or school enrolment data also by sex and age. Enrolment data by level of school are always necessary; additional information on the distribution of the grade is also desirable.

The term 'enrolment ratio' is defined as 'the proportion of the children in a given age group enrolled at school.' This may

$$Re = \frac{E}{P}$$

where Re = enrolment ratio  
 E = No of children enrolled  
 P = Total number of children in the age group or group concerned.

In projection work the problem is to determine E for some future year as number of year, so, the formula is written as :-

$$E = Re \times P$$

It is clear that E can be determined once "Re" and "P" are known. Indeed, the fundamental problem of enrolment projection work is to assign values to "Re" and "P" for future years.

An illustration of basic operation:

The basic process involved in the projection work under this method may be illustrated here by an example. Let us assume that in the past five years the number of five year old children that entered the infant departments of schools expressed as a proportion of their age group was as follows :-

<u>*Year</u>	<u>Proportion of 5 year old enrolled</u>
-4	.75
-3	.77
-2	.78
-1	.81
-0	.83

\* (The notation of years as "0" for the latest year of known information and as "-1" etc. for the previous years removed by one, two etc. Years from the latest will be found convenient as a means of distinguishing "base-year" from projection years.)

It will be seen from this series that the rates of increase in the proportion of five year olds attending school was for the years under consideration approximately 2% per annum. Now let us assume that the number of all children of age 5 in the next five years ( which can be assessed on the basis of the present number of children aged 0,1---4 ) will be as follows:-

<u>Year</u>	<u>Total number of children aged five</u>
+ 1	10,000
+ 2	9,500
+ 3	9,700
+ 4	9,400
+ 5	9,000

A decision has now to be made on the probable trend of the enrolment proportions in the next five years. The past five years suggested a rate of increase of 2% of the age-group. The forecaster may, therefore decide to assume continuation of the increase at a flat rate of 2 % as is done in the table shown below :-

T A B L E :  X   
AN EXAMPLE OF PROJECTED ENROLMENT COMPUTATION

Year	Multiplied by projected proportion of age group enrolled	Estimated population of age five	Estimated projections (2) + (3)	Projection(4) rounded to the nearest 25.
<u>1</u>	<u>(2)(1)</u>	<u>(3)(11)</u>	<u>(4)</u>	<u>(5)</u>
0	.83			
+ 1	= .85	10,000	8,500	8,500
+ 2	= .87	9,500	8,265	8,275
+ 3	= .89	9,700	8,633	8,625
+ 4	= .91	9,400	8,554	8,550
+ 5	= .93	9,000	8,370	8,375

Notes:- (i) Ratios observed in the last years extrapolated after decision on assumed rate of increase (2% per annum).

(ii) Age estimates intercensal or derived from births in corresponding years adjusted for mortality at age 0 through 4 and for migration.

In practice the decision to assume the continuation of an increase of 2% would involve consideration of the other factor that the rate of increase during past years. For example, there is of course an upper limit reached when 100% - or perhaps more realistically, 95% of the whole age group are enrolled. The rate of increase may slow down as enrolment approached the upper limit. On the other hand it may become more rapid when the age-group involved shows some decline and enough school places would be available without overcrowding of classes.

Practically the above method has two different approaches :-

Ist Approach: This approach may be called as "gross-enrolment-ratio method." Here we do not project for single age year, but for a particular age group e.g. 6 to 11 years, 11-14 years, 14-17 years etc. Suppose there were 44,633 students in class I-V in 1963 in India and the estimates of population in this age group i.e. 6-11 years were 61,072 so enrolment ratio will be :

$$Re = \frac{E}{P} \times 100 = \frac{44633}{61072} \times 100 = 73\%$$

Similarly, we may take enrolment ratio at 'five-year' or more intervals and find out the rate of increase per year in the two intervals, thus, can project the enrolment ratio in future years also. This ratio may be multiplied with the estimated population in the relative age-group in the years under projection. The rate of increase per year in the enrolment ratio can be obtained with the help of the following formula :

Taking enrolment figures, if "r" be the percent rate of increase in "t" years and E be the enrolments at the base year and the t th year :

$$r = \frac{Et - Eo}{Eo} \times 100$$

In order to calculate the annual rate "R" we should divide "r" by "t", so that

$$R = \frac{r}{t} = \frac{Et - Eo}{Eo \times t} \times 100$$

The main disadvantage of this approach is that it is a crude approach because it is based upon the assumption that all the student population in classes say I to V are in the age group of 6 to 11 years. Specially, it is not the case with the developing countries where about 40% of the pupils are from outside their age group. This method also takes into account the constant rate of increase but this can be remedied by making certain adjustments on the basis of past experience.

2nd Approach: We may also call this approach as "age specific enrolment ratio method". This approach is similar to the first approach but here we take into account every age year for projection purposes. For example, enrolment ratios accordingly for all ages of 15 and higher, are as follows :

Year	( Ratios multiplied by hundred )	
	1965	1970
Age 15	57.1	62.6
16	31.4	34.9
17	13.3	12.9
18 +	3.6	3.1

On the basis of the above data we can project the enrolment for each age year in future according to the method given already in the basic approach to this method.

This approach can lead towards refined results even from the first approach but the data collected for it should bear a good degree of accuracy.

Linking of survival ratio with enrolment ratio projections:

The minimum of educational statistics, it was said above, is a cross tabulation of the pupils by ages and by classification. Such a table ( with enrolment by age in the lines and enrolment by class in the columns ) will have two sets of tables. Both sets of tables when added give the same grand total of enrolment.

The projection of enrolment by the method of enrolment ratios referring to total population specific for age, produces the age total columns in such a cross tabulation. The projection by the supplementary method of school and class survival ratios produces the class totals in the bottom line of such a cross tabulation. If these latter are cross added, the sum must be the same grand total as that given by the age totals as given in the following table :

T A B L E : XI

Total school enrolment Projection<sup>a</sup> - 1975

Age	Class VI	C VII	C VIII	C IX	Age totals by enrolment ratio method
12					1,500
13					30,800
14					48,100
15					36,900
16					21,200
17					6,600
18 +					1,500

Class total by survival ratio method	<u>47,700</u>	<u>47,300</u>	<u>38,200</u>	<u>13,400</u>	<u>1,46,600</u>
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VI, VII, VIII and IX have been chosen in such a way that total enrolment (as sum of the products of each ratio and the corresponding number of class V pupils projected for 1974, 1973, 1972 and 1971 respectively) coincided with the grand total obtained from the enrolment ratio method.

The total enrolment in all classes obtained by using survival ratios may be higher or lower than the total number of enrolments by age obtained by applying enrolment ratios to age groups. The class totals will have to be lowered or raised accordingly, until they reach the grand total enrolment figure. This "smoothing" operation is controlled not only by the grand total but by the general pattern of classification by age and its expected changes.

When this has been done, the corrected projection of class enrolment can be divided by the projected class V enrolment in the corresponding years. The resulting fraction shall represent the corrected survival ratios.

#### Projection for different stages of education:

For projection purposes the stages of education may be divided as follows :-

1. Primary stage ( I-VIII classes )
2. Secondary stage ( IX-XI classes )
3. University stage
4. Teachers' training institutions
5. Professional education

#### Primary and Secondary stage Projection

For these stages any of above methods is good. For grade-cohort method it is essential to estimate the size of future cohorts in the beginning grade. This may be done by observing the rate of growth of past cohorts and estimating future cohorts by assuming a hypothetical rate or annual amount of increase:

- a/ Where estimates of population in appropriate age-groups are available, the beginning cohort may be estimated by means of an intake ratio based on past observations, assumed either to increase or to remain unchanged;
- b/ beginning cohorts for higher levels of schools may be estimated from observed intake ratios based on the relationship between the last grade of the lower school and the first grade of the higher school.

#### University stage projections

The following different methods can be used for this stage :-

- a/ Closed or open access to the Universities  
It is only a relatively free system of university education that the need for projection of future enrolment arises. In a more or less closed system (where access to university education is limited to a fixed number of available places) it is, strictly speaking, not the future enrolment itself that is being forecasted but the probable number of potential students claiming admissions. Sometimes projections are limited to manpower needs. If this distinction

appreciated.

b/ Enrolment ratio by age projection

In a number of countries e.g. Australia, the projection method has been based in the first instance on the predictable increase in the age groups to which majority of university students belong. Age ranges, such as 18-21 or 17-22 have been employed for this purpose.

c/ Projections linked to secondary school survival ratios.

This method avoids the concept of 'university age population' because with a high proportion of part-time students, a large number of students enrolled at university are actually outside such a restricted age-range. Under this method projections are based on survivals from the highest secondary class to the freshman year <sup>at</sup> the university in ~~and~~ survival at University in subsequent years to graduate and post-graduate status.

Enrolment projection for teachers' training institutions:

The best method for this is to project the past trend into the future but allowance is to be made for some further assumptions. To estimate the average enrolment needed in teachers training schools, we should take into account the increasing enrolment of pupils and the stress on further reduction of the pupils per teacher ratio.

Enrolment projection for professional institutions

For enrolment projections/<sup>upto</sup> school level of vocational education, we should try to find out the proportion of enrolment in these schools to total secondary schools enrolment and on the basis of that ratio projections may be made. For higher level of professional education enrolment projection, future manpower needs in addition to trend projections are required to be taken into account.

Area Projections:

The methods of school enrolment projection that have been discussed above so far referred to national forecasts. Projections for a defined region or smaller area within a country are in certain respects more difficult to make, their necessary assumptions less secure, and their results subject to a greater margin of error.

So, the best method for area projection is the "area ratio method" by which we mean the employment of the ratio of area-school-enrolment to national-school-enrolment. There will be as many ratios of this kind as there are areas. If these ratios are observed over a fair number of base years, they may be found to increase or decrease. By definition, the sum of all area ratios equals unity, just as all area enrolments add up to national enrolment.

Once ascertained for the base years, the rate of change in the area enrolment ratios can be extrapolated in the same direction for a number of years ahead.

Models for enrolment projections

Here we shall consider certain models relating to flows of students in the educational system. Some of these are based on the relationship of population in a given age group to the enrolment in a given class, and others are stochastic type

models involving transitional probabilities of movement of students from one category to another.

The following is a basic identity relating enrolment to the in-put (i.e. new entrants) and cut<sup>-put</sup> (i.e. graduates) in an educational system. For a given grade :-

Formula ( A-1 )

$$E_y + N_y + R_y + V_y = G_y + D_y + R_{y+1} + M_y$$

Where

- E<sub>y</sub> = enrolment in year Y
- N = number of students promoted from previous grade
- R = number of repeaters
- V = number of new students re-entering educational system
- G = number of graduates
- D = number of drop-outs
- M = number of student deaths.

The simplest model for enrolment is one which expresses it as a function of population. For the year Y.

Formula (A-2) :

$$E_y = f(P_y)$$

where P<sub>y</sub> = population in year Y.

For a given grade "g" and age "a", the enrolment is usually expressed as a fixed fraction of the population of age a, i.e.

Formula ( A-3 )

$$E_y^g = e_y^g \cdot P_y^a$$

Where

e = enrolment ratio

For grade I, the model (A-3) is adequate. For other grades, one can express enrolment as a fraction of the enrolment in the previous grade in the previous year, so that :

Formula ( A-4 ):

$$E_y^g = (1 - O_{y-1}^{g-1}) E_{y-1}^{g-1}$$

where  $O_{y-1}^{g-1}$  is the proportion of enrolment leaving school system (out-put rate).

If there are different types (t) of courses, one can express the enrolment in grade I for the type 't' course as  $E_y^{t.g}$

A more general model can be written for enrolment in grade 'g' for any course and for age "a" as

Formula ( A- 5 )

$$E_y^{a.g} = e_y^{a.g} B_y^a + S_{y-1}^{a-1} r_{y-1}^{a.g} E_{y-1}^{a.g} + S_{y-1}^{a-1} + p_{y-1}^{g-1} E_{y-1}^{a-1} + I_y^{a.g} + N_y^a$$

Where

- e = rate of first enrolment
- B = population not previously enrolled
- r = repetition rate
- p = promotion rate
- σ = survival rate- demographic

- I = net immigrants from other states.  
N = new comers who were in school once but remained out of school for 1 or more years  
→ = going to

Conclusion: As one reviews the descriptive demonstration of methods of school enrolment projection, one fact becomes clear. Refinement in method ultimately depend on what statistical information can be exploited for the purpose. If the records are of a high standard there will be high validity of projection. Validity may be considered high if the permissible projection error is not more than 1% of total enrolment in short-run projections under some conditions (compulsory education) or at the most five percent in other conditions.

Condition under which projections have to be made are not always so favourable. But one need not despair in less favourable condition. It is true that the projections will be of less degree of validity but they will nevertheless serve a useful purpose. Continuous review and revision of earlier projections in the light of further observations and analysis of the relevant facts is an important means of maintaining if not improving the degree of validity.

References

1. E. G. Jacoby, 'Methods of School Enrolment Projection', Educational Studies and Documents No. 32, U.N.E.S.C.O., 1958, Paris.
2. I. L. Kendel, Raising the School leaving Age, Studies on Compulsory Education No. 1, U.N.E.S.C.O., 1951, pp.71.
3. Harold E. Dorn, 'Pitfalls in Populations forecasts and Projections', Journal of the American Statistical Association, Sep. 1950, ( Washington, D.C., pp 326 )
4. UNITED NATIONS, Population Branch, Methods for Population Projections by sex and age, Population Studies No. 25, 1956, New York, pp.69.



CHAPTER VIII

TEACHERS

Teachers form one of the most important and most numerous group of workers ( about 1% ). In education, which is most important industry involving about one person in every four, it is most important category of workers.

In projecting the requirements of teaching manpower according to sex, length of experience, education and training and other related characteristics, the following information is-required :

- a/ Detailed information about the distribution of stock of teaching manpower in the base year according to age, rural-urban location , length of on the job experience, etc;
- b/ information about the distribution of enrolment in the base year according to sex, region, rural-urban location , etc;
- c/ Prospective growth in population in the school going age groups according to sex and region;
- d/ Assumptions about the increase in the provision of facilities for the school going population;
- e/ Assumptions about the changes in teacher-pupil ratios according to different stages of education; and<sup>u</sup>
- f/ Assumptions about the prospective rates of wastage in the working stock of teachers on account of withdrawal from working life due to marriage, retirement, death and other reasons.

J.P.Naik in his lecture on "Teachers-Current Manpower Problems" in IAMR on February 25, 1970 has referred to the other problems involved in projection of teachers requirements :-

- a/ we must have data about trained and qualified teachers who are unemployed. This is not always easy to find.
- b/ We must have data about the attrition rates from year to year on retirement, death, resignation, etc. These vary from year to year, from area to area and from one category of teachers to another.
- c/ We must have data about annual output of different categories of teachers. This can be had from the Departmental Statistics.
- d/ At the secondary and university stage, we need to estimate the subject-wise requirements of teachers.
- e/ Separate estimates are needed for such categories as women teachers, teachers for handicapped children, teachers from the tribal or harijan groups etc;
- f/ Past experiences in estimating are also required to study causes leading to wrong estimates.

Method of forecasting:

When enrolments for different years have been estimated, it remains to calculate the number of teachers, the number of schools and the expenses involved. So far as the teachers are concerned, the estimate is based upon pupil-teacher ratio. The ratio is obtained by dividing the total enrolment by the total number of teachers :

$$f = \frac{E_y}{T_y}$$

where f= teacher-pupil ratio  
T= number of teachers in a particular year and grade  
E= enrolment in particular grade and year

Sometimes we speak of teacher-pupil ratio which is the reverse of pupil-teacher ratio. Suppose teacher-pupil ratio is 1:40 while the pupil-teacher ratio will be 40:1.

To begin with, the base year ratio is computed and on the basis of the resources available, this pupil-teacher ratio is altered in future years. Some compromise becomes necessary in this respect. If the present pupil-teacher ratio is 35:1 evidently it will not be proper to raise it to 40:1 or any other such figure if the quality of education is not to be allowed to deteriorate. But at the same time, if the enrolment is to be increased considerably and if the salary of teachers is also to be improved, there will be heavy burden on the finances of the State, if no adjustment is made in the pupil teacher ratio. According to the situation obtaining in a country, it has to be decided how the teacher-pupil ratio should be varied. Either we should be satisfied with the better paid teachers and larger classes or we should reconcile ourselves with the low-paid teachers and smaller classes. On the basis of teacher-pupil ratio it is not very difficult to estimate the number of teachers that would be required for primary education. To start from the base year again, if we subtract the number of teachers in position in base year from the total required in any future year, we get additional teachers required.

Another factor which should be taken into account is the replacement of teachers. Many teachers retire from service or die or they leave the teaching profession. If we get the total number of persons who give up the teaching profession, we get replacement percentage "t" with the help of the following percentage :-

$$t = \frac{L}{T} \times 100$$

where L = number of teachers leaving teaching profession during the year.

Models for projection

The number of teachers needed for teaching in a grade and type of education is determined by :

Formula (B-1)

$$T_y(t.g) = \frac{E_y(t.g.)}{f_y(t.g.)}$$

where T = number of teachers needed for teaching  
 f = pupil-teacher ratio  
 E = enrolment in a particular year 'Y' in a grade 'g' and type of education 't'.

The number of additional teachers required is given by:

Formula (B-2)

$$T_y(t.g.) = \frac{E_y(t.g.)}{f_y(t.g.)} - \frac{(1-Z_{y-1}(t.g.)) E_{y-1}(t.g.)}{f_{y-1}(t.g.)}$$

where Z = proportion of teachers leaving school system for various reasons ( e.g. retirement, death, change of profession).

In a more elaborate model, separate rates of retirement, death etc. could be used. The more general model will be ( for grade 'g' and course 't' ).

Formula(B-3)

$$T_y(t.g) = \frac{E_y(t.g.)}{f} + ( b_{y-1}^{(t.g.)} + d_{y-1}^{(t.g.)} - s_{y-1} ) \frac{E_{y-1}(t.g.)}{f_{y-1}^{(t.g.)}}$$

where s = survival rate  
 b = retirement rate  
 d = rate of transfer from teaching to other profession.

In another approach, the average number of periods per week, per student and per teacher are used for estimating the number of teachers required. If 'Sh' is the average number of student taking each period then ,

Formula (B-4)

$$Sh = \frac{h_s E}{h_c T}$$

where h<sub>s</sub> = average number of periods per week per student  
 h<sub>c</sub> = average number of periods per week taught by a teacher  
 E = number of students  
 T = number of teachers

certain target values of Sh, h<sub>s</sub>, and h<sub>c</sub> are fixed, and T is estimated from Formula B-4 once the projected value of E is known.

References

- 1.H.N.Pandit, National Teaching Manpower for school stage Education: Past trends, Present position and future growth, Indian Educational Review, Vol.4, No.2, July, 1969, NCERT, New Delhi.
- 2.J.P.Naik, Teachers' Current Manpower Problems, Lecture delivered in Institute of Applied Manpower Research, Feb25, 70, New Delhi.
- 3.Y.G.Brolin, Statistics needed for educational planning, Chapter X in "Economics & social aspects of Educational Planning" UNESCO, 1963, Paris, page.228.
- 4.UNESCO: An Asian Model for Educational Development, Perspectives for 1965-80, 1966, Paris.

CHAPTER IX

CLASSROOMS

The projection of the number of institutions, new buildings or classrooms that would be needed for future will depend upon many factors, such as :-

- a/ Enrolment → size of institutions
- b/ Population → distribution of population
- c/ Location → walking distance

The above three approaches can be also taken together or individually but supplemented by other two factors. Not only will new buildings be needed, but the old ones which are not in good conditions will also have to be replaced.

One very important factor which will have to be taken into account while estimating primary school buildings is the frequency distribution of villages according to the size of the population. If a village has the population of 2000 or more, it is likely to have about 250 children in the age group 6-11 and assuming a rate of 2.5% population growth, about 50 children are likely to attain the age of six every year. Hence, in such a village, a primary school of 6 grades enrolling about 240 students can be expected to run without any difficulty about adequacy of numbers. But it may be difficult to find enough students to justify a primary school in a village with population much less than 2000. Such villages should be grouped together in a convenient way, but if the distance between them are great or if the terrain is mountainous, some device will have to be thought of to provide adequate primary school facilities in smaller villages. Of course the dividing point of 2000 persons is only a rough indicator. Suitable modification in this respect may be made depending on the population pattern of a country. While taking enrolment as basis for projecting number of institutions, the computation should be made on the basis of the maximum and not the actual enrolment of the school. Method here adopted is just as projection of number of teachers required based upon pupil-teacher ratio. Average number of students per institution

$$S_y^{(t.g.)} = \frac{E_y^{(t.g.)}}{T_y^{(t.g.)}}$$

where E = enrolment in a particular year in a specific type of education in a particular grade,

T = total number of institutions of that type of education in that year and grade.

On the basis of this future projection can be made.

CHAPTER X

COSTS AND OUTLAY

Before undergoing in details, a clear distinction should be made between "Cost" ( in the economic sense ) and " Outlay" or "Expenditure" ( in the accounting terms ). The former corresponds to what should normally be the value of goods or services and the later what is actually spent. The concept of cost is careful for long term planning while expenditure is valid for allocation analysis.

Other terms and concepts:

Following are the other important terms which are used in this connection from time to time :-

- i/ Unit outlay :- Expenditure on a given unit i.e. per teacher, school, pupil, square foot, etc. over a given time period viz. usually one year.
- ii/ Unit outlay analysis :- The examination of past developments in expenditure on a given unit or units.
- iii/ Unit outlay budgeting :- The use of unit outlay analysis as an aid in reaching current decisions on allocation of resources.
- iv/ Unit outlay Forecasting :- The use of unit outlay analysis to estimate future outlay requirements.

Need of Unit Costs:

Knowledge about various types of costs for different disciplines and different levels of education is needed :-

- i/ for working out financial allocations and costing of educational programmes;
- ii/ for studying the level of efficiency at which the educational plan is run;
- iii/ to ensure optimum utilisation and to improve the efficiency of resources invested in education through their analysis and consideration of various alternative combinations of their components; and
- iv/ to measure the costs of inputs in the education industry in determining the returns to education and productivity of the process

Here we shall limit our study only to the use of unit costs for "working out financial allocations and costing of educational programmes".

Components of cost of education:

Mr. D. L. Sharma in his paper on "Unit Costs of Education, Our Knowledge, Gaps and Our Needs " has given the following table to illustrate the components of cost, on education :-

COMPONENTS OF COSTS ON EDUCATION

Total Costs

Institutional Costs

Students Costs

Opportunity costs

Tution and other fees    Books and Stationery    Boarding and lodging    School uniform    Other Miscell. expenses

NonRecurring

Recurring

Cost of land farm    Cost of construction of school building    Cost of equipment and plant    Cost of furniture    Cost of Staff quarters    Cost of construction of hostel    Cost of library    Cost of laboratory

Cost in an institution

Costs on an group of students

Direction and inspection    Pensions to teaching and non-teaching staff    Conduct of Public Examinations    Maintenance of University/Board of Examinations    Various Ministries and other agencies

Salaries to teaching staff    Salaries to non-teaching staff    Scholarships stipends and other financial concessions    Amount foregone on account of free studententshins    Midday meals, school uniform etc.    Conduct of examinations    Rents,rates and interest    Hostel    Contengencie:

Repairs to building and furniture, etc.    Maintenance of workshon, farm, garden,etc.    Cultural and extra-curricular activities    Purchase of library books, journals, etc.    Other Miscellaneous items

Projection of future educational costs :

Before undertaking the projection of future educational costs it is clearly desirable to make preliminary analysis of past educational expenditure. Future expansion of the educational system is never a completely new start but always a continuation of an existing system with old ( sometimes centuries old ) traditions. These traditions- what a community considers as "normal" and economically and politically "feasible" - will certainly play an important role in the allocation of future educational funds.

So, the projection of future education-costs will entail following two steps :-

- a/ the analysis of educational expenditure
- b/ the projection of future educational expenditure

a/ Analysis of past educational expenditure:-

The first step of analysis which might be taken in the relationship between the main components of total cost, for example between personnel and other current expenditure, or between the various components of expenditure on educational materials. If the analysis shows that there is a systematic relationship between some of the cost components, this could greatly facilitate the task of making projection of educational expenditure. Instead of spending much time and effort on cumbersome calculations of relatively important cost factors, it will be necessary only to concentrate on one or two important cost factors and assume that the others will develop proportionately. It may, for example, will be possible, at least in short run, to assume a systematic relationship between teachers' salaries and total current expenditure.

The next step of the analysis is to try to explain the determinants of cost changes over as many years as possible. For this purpose we may assume that educational expenditure in a year is determined by three factors :-

- i/ Quantity
- ii/ Price
- iii/ A residual factor which may be closely related to educational Quality

i/ Quantity: The major measure of the quantity of educational effort is the number of pupils or students enrolled. Other important indicators of quantity of education are the number of teachers and the number of school buildings, classrooms etc. Systematic changes in the expenditure per unit on these items should be identified from past statistics or from future intention and should be taken into account when making projections.

ii/ Price: Changes in the price structure also affect estimates of educational expenditure through their effect on the relative levels on teachers salaries and on the price of the materials purchased for educational sector. So, the changes in the general price index may be taken into account.

iii/ Qualitative and other residual components of expenditure changes: There are so many factors which lead to changes in the educational expenditure e.g.

- a/ Expenditure on personnel:-
- i/ changes in the sex-composition of teaching staff ;
  - ii/ changes in the proportion of qualified and unqualified teachers ;
  - iii/ changes in the age-composition of teaching staff ; and
  - iv/ shortage of teachers of particular specifications may result in differential salaries.
- b/ Other expenditure:
- i/ changes in the age of school buildings which will affect maintenance expenditure;
  - ii/ an increasing proportion of expenditure is often devoted to ancillary activities i.e. sports, recreations, meals etc. ;
  - iii/ changing teaching methods which are likely to affect the type and quality of books, instruments, equipment etc., and
  - iv/ changes in the legal or other standards for maximum or minimum size of classes may have considerable effects upon classroom cost-per-student.

**B. Projection of Future educational expenditure:**

A preliminary analysis along the lines indicated above will permit the calculation of a wide range of technical coefficient which may be used as a basis for calculating the cost of planned educational developments. Following are the some of the such technical coefficients :-

- i/ estimated salary per teacher during the planning period according to age, sex, status and specialisation, in each main branch of education;
- ii/ estimated cost per unit of each of the major items of equipment required by the educational system e.g. television and radio sets, desks and work benches etc.;
- iii/ estimated expenditure-per-pupil of other miscellaneous items of equipment; and
- iv/ estimates of cost providing a new student place in each of the main branches of education.

**Selection of Method:-**

A number of different methods may be used for projecting future educational expenditures on the basis of the analysis described in the previous paragraphs. The choice between methods will depend very largely upon the statistical data which can be collected. For projection purposes expenditure may be divided in two parts :-

- a/ Current expenditure; and
- b/ Capital expenditure

**Projection of current expenditure :-**

- **Approach:-** The simplest and the quickest method of projecting future current expenditure is by estimating the average expenditure per pupil for one or a number of years and multiplying this by the expected number of pupils in each year of the planning period. This method has the attraction of simplicity and it requires little time and statistical information. Its weaknesses are, however, such that it should only be used where time or the available statistics prohibit the use of more sophisticated methods. It has been seen that educational expenditure is not directly related to the number of pupils but rather to the real resource inputs into education.

**2nd Approach:-** The most important component of current expenditure is the remuneration of personnel, so a projection based not on the



increase in their remuneration is likely to provide a much better and almost equally straight forward method of approach. In its simplest application, the total current expenditure in the base period is multiplied by the increase in the number of teachers and the expected rise in the teachers' salaries over the period under projection. This of course assumes that the share of personnel expenditure in the total current expenditure remains constant over the period under projection.

**3rd Approach :-** More sophisticated method of projection will make full use of the analysis outlined in the preceding sections. The analysis will have indicated the principle components of educational expenditure and cost in each branch of education, and the projection of future expenditure can be used on this knowledge. If, for instance, it were found that the level of personnel expenditure was determined mainly by the number of teachers, the level of salaries, the age and the sex of teachers and their qualifications, a projection could be based on the planned increase in the number of teachers the expected rise in their salaries and the change in their qualifications and age structure. Similar independent projection may be made of a number of other important cost components such as major items of equipment, maintenance and repairs of buildings, electricity consumption etc.

It may be recalled, however, that the number of individual items consumed in the educational process is rather substantial and detailed projection for each item are likely to prove rather complicated. However, the process of making projection can be very much simplified if the preliminary analysis has revealed a systematic relationship between a number of different cost items.

**4th Approach:-** It is supplementary method to 3rd approach. Here the items of current expenditure other than personnel remunerations are treated on a per-student-basis. Assumption can be made about an increasing per-student expenditure on these items to allow for improved quality of education insofar as it is represented by more and more expensive equipment.

Models for projections of recurrent expenditure:-

Recurring costs may be explained as follows :-

Formula (D-1)

$$V_y(t.g.) = V_a(t.g.) + V_b(t.g.) + V_c(t.g.) + V_d(t.g.) + V_e(t.g.) + V_f(t.g.) + V_g(t.g.) + V_h(t.g.) + V_i(t.g.)$$

where Y = year,

g = grade,

t = type of education

- V = per-pupil recurring cost
- Va = per-pupil teacher salary cost
- Vb = per-pupil personnel cost, other than teacher salary cost
- Vc = per-pupil cost of general administration
- Vd = per-pupil cost of maintenance and operations of educational establishments.
- Ve = per-pupil cost of books
- Vf = per-pupil welfare cost ( school meals )
- Vg = per-pupil auxiliary cost ( transportations etc )
- Vh = per-pupil scholarship and stipend cost
- Vi = per-pupil cost of instructional materials other than books

The per-pupil cost for the items shown in the formula are, of course, type and grade specific. As such they are actually averages of the gross costs divided by the enrolment. Thus, for example, 'Va' is equal to the total teacher salary cost for a type grade divided by the enrolment in the type-grade, and so forth.

To deal with some of the items used in Formula D-1 individually in order to obtain the average per-pupil values for a type-grade, following formulae may be used :-

$$\text{Formula (D-2)} = \frac{V_a(t.g.)}{y} = \frac{F(t.g.)}{f_y(t.g.)}$$

where F = average-teacher-salary,  $f_y$  = pupil-teacher ratio.

$$\text{Formula (D-3)} = \frac{V_e(t.g.)}{y} = V_e(t.g.) \cdot U_y(t.g.)$$

Where  $V_e$  = per-pupil cost of books for pupils receiving books

U = proportion of pupils receiving books

$$\text{Formula (D-4)} = \frac{V_f(t.g.)}{y} = V_f(t.g.) \cdot \hat{U}_y(t.g.)$$

where  $V_f$  = per-pupil welfare cost for pupils receiving welfare

$\hat{U}$  = proportion of pupils receiving welfare

$$\text{Formula (D-5)} = \frac{V_g(t.g.)}{y} = V_g(t.g.) \cdot \hat{G}_y(t.g.)$$

where  $V_g$  = per-pupil auxiliary cost for pupils receiving auxiliary services

$\hat{G}$  = proportion of pupils receiving auxiliary services

$$\text{Formula (D-6)} = \frac{V_h(t.g.)}{y} = V_h(t.g.) \cdot \hat{H}_y(t.g.)$$

where  $V_h$  = per-pupil scholarship and stipend cost for pupils receiving scholarships and stipends

$\hat{H}$  = proportion of pupils receiving scholarships and stipends.

Formula (D-7):

In cases where other cost items are important or where accounting system lead to classification of items different from those shown in Formula D-1, they can be used in the same manner. Total recurring cost are merely :-

$$TV_y(t.g.) = V_y(t.g.) \cdot E_y(t.g.)$$

where TV = total recurring costs  $E$  = enrolment

Formula D-1 and D-7 with proper notation of the relevant items are applicable to all forms of education i.e. school and adult. In obtaining total recurring costs, either for a type grade or for a combination of some or all type-grades, cost items which may not be obtainable by type-grade, such as central administrations, must be added to the relevant recurring cost table.

For the formulations of a model of educational plan in Asia 1965-80, UNESCO has used the following version of the above formula (D-1) for calculation of recurring costs :-

$$\text{Formula (8)} \quad V_y^{(t.g)} = \frac{F_y^{(t.g)}}{f_y^{(t.g)} K_y^{(t.g)}} + V_e^{(t.g)} + U_y^{(t.g)} + V_h^{(t.g)} + E_y^{(t.g)}$$

where K = proportion of average, teacher salary to all recurring costs including books, welfare, auxiliary, stipend and central administration.

In this Formula, the per-pupil recurring costs for teachers salaries and for non-teaching personnel, general administrations, maintenance and operations and instructional materials other than books have been combined. In other words the expression :-

$$\frac{F_y^{(t.g)}}{f_y^{(t.g)} K_y^{(t.g)}}$$

used in the above formula is equal to  $V_a + V_b + V_c + V_d + V_i$  in formula P-1.

Total recurring costs, by type and grade were obtained by :-

$$\text{Formula (9)} \quad TV_y^{(t.g)} = V_y^{(t.g)} \cdot E_y^{(t.g)}$$

which is identical to formula D-7. It should be noted that these costs include welfare, auxiliary and the central administration costs not attributable by level and type. The central administration costs which were not attributable by level and type were assumed as a fixed proportion to total recurring costs (excluding stipends). Thus total recurring cost for all types and grades, combined was expressed by :-

Formula (D-10)

$$TV_y = V_y E_y + L_y (V_y E_y - V_h E_y)$$

where L = percentage of central administration costs to all other recurring costs excluding welfare, auxiliary and stipend costs.

#### Projection of Capital expenditure:-

Following are the main approaches which can be followed for the projection of capital expenditure according to the availability of the data :-

**1st Approach:-** The projection of future capital expenditure can best be made upon the estimated cost of providing a new student place which is largely a matter of judgement. The factors which will influence this judgement include expected future price levels in construction industry, changes in the legal requirements of the class room space per pupil, expected changes in the actual amount of classroom space available per pupil, anticipated changes in the amount of auxiliary facilities per pupil (corridors, toilets, libraries, recreation facilities etc.)

When estimates have been made of the expected future cost per student place in each branch of education and type of school, these are multiplied by the required number of new student places in each type of school to arrive at an estimate of required capital expenditure. Here we must take into account

ration the provisions for replacing obsolete buildings and very often to alleviate over crowding.

**2nd Approach:-** Another method of estimating future capital expenditure requirements is based upon estimates of the cost of providing new classrooms, workshops and laboratories, libraries. Although this method bears superficial resemblance to the first approach - that what are actually built are classrooms and not square metres per pupil. But is a open to number of objections as a medium and long term planning tool. Firstly, classroom is not a very homogeneous concept and could refer to anything from a small seminar room to a fairly large lecture hall. Secondly, the cost per class room is likely to vary considerably according to the size of the school, in which the classroom is placed. Thirdly, it requires projection: not only of the average number of pupils per class but of their distribution in different sized classes.

This method is, however, valuable for short-term budget making. It is, of course, virtually impossible in the case of higher education.

**3rd Approach:-** A crude method has also been suggested by Dr. G.P. Khare for Asian countries for estimating capital expenditure by correlating it with the current expenditure and work out the estimates for capital expenditure on the basis of the recurring expenditure which can be estimated with greater accuracy and reliance. The main difficulty in using the ratio between recurring and capital expenditure seems to be the fact that a lot of expenditure has to be incurred on replacing the old buildings.

Models for projection of capital expenditure

Capital costs for this purpose may be divided into three categories:-

- a/ Capital cost for schools;
- b/ For student residences ; and
- c/ For teacher residences.

Each of these may be expressed in unit terms. Thus for schools, the cost in per-pupil-place terms is :-

Formula (11)

$$\begin{aligned}
 U_y &= C_a y \frac{(t.g)}{q_a y} + C_b y \frac{(t.g)}{q_b y} + C_c y \frac{(t.g)}{q_c y} \\
 &+ C_d y \frac{(t.g)}{q_d y} + C_e y \frac{(t.g)}{q_e y} + U_b y \frac{(t.g)}{q_b y} \\
 &+ U_c y \frac{(t.g)}{q_c y} + U_d y \frac{(t.g)}{q_d y} + U_e y \frac{(t.g)}{q_e y}
 \end{aligned}$$

where :-

- U = per-pupil-place capital cost for school
- C<sub>a</sub> = cost of site per unit area for schools ( land and additional costs)
- C<sub>b</sub> = cost per unit-area for building teaching and common facilities
- C<sub>c</sub> = cost per unit-area for building laboratories
- C<sub>d</sub> = cost per unit-area for building auditoria and gymnasia
- C<sub>e</sub> = cost per unit-area for building workshops and other special school facilities
- q<sub>a</sub> = per-pupil-place area requirements for site for school
- q<sub>b</sub> = per-pupil-place area requirements for teaching and common facilities

- qc = per-pupil-place area requirements for laboratories
- qd = per-pupil-place area requirements for gymnasia and auditoria
- qe = per-pupil-place area requirements for workshop and other school facilities
- Ub = cost-per-place for furniture and equipment etc. for teaching and common facilities
- Uc = cost-per-pupil place for furniture and equipment etc. for laboratories
- Ud = cost-per-pupil-place for furniture and equipment etc for auditoria and gymnasia
- Ue = cost-per-pupil-place for furniture and equipment etc for workshop and other school facilities.

Similarly, for student residences, the cost, in per-resident -place terms is :-

Formula (D-12)

$$U_y(t.g) = C_f \left\{ \frac{(t.g)}{y} \right\}^{q_f} + C_g \left\{ \frac{(t.g)}{y} \right\}^{q_g} + C_h \left\{ \frac{(t.g)}{y} \right\}^{q_h} + U_g \left\{ \frac{(t.g)}{y} \right\} + U_h \left\{ \frac{(t.g)}{y} \right\}$$

where :-

- U = per-student-place capital cost for student residences
- Cf = cost of site per-unit-area for student residences ( land and additional costs)
- Cg = cost-per-unit for building student residences bedrooms and dormitoris
- Ch = cost-per-unit-area for building student residence common facilities, including kitchens, dinning rooms and service facilities
- qf = per-resident place area requirements for site for student residences.
- qg = per-student place area requirements for student residence bedrooms and dormitoris
- qh = per-resident-place area requirements for student residence common facilities including kitchens, dinning rooms and service facilities
- Ug = cost-per-resident place for furniture and equipment etc. for student residence bedrooms and dormitoris
- Uh = cost-per-resident place for furniture and equipment etc for student residence common facilities including kitchens, dinning rooms and service facilities.

For teacher residence, the cost in per resident place terms is :-

Formula (D-13)

$$\hat{U}_y(t.g) = C_i \left\{ \frac{(t.g)}{y} \right\}^{q_i} + C_j \left\{ \frac{(t.g)}{y} \right\}^{q_j} + U_j \left\{ \frac{(t.g)}{y} \right\}$$

where :-

- $\hat{U}$  = per-resident-place capital cost for teacher residences
- Ci = cost per-unit-area for teacher residences ( land and additional costs )
- Cj = cost-per-unit-area for building teacher residences
- qi = per-resident-place area requirements for site for teacher residences
- qj = per-student place area requirements for teacher residence buildings
- Uj = cost-per-resident-place for furniture and equipment etc for teacher residences

Total capital costs are, therefore the costs for the above categories thus :-

Formula (R-14)

$$T U_y(t.g) = U_y \left\{ \frac{(t.g)}{Q_y} \right\}^{q_y} + \hat{U}_y \left\{ \frac{(t.g)}{Q_y} \right\}^{q_y} + U_y \left\{ \frac{(t.g)}{Q_y} \right\}^{q_y}$$

where :-

- TU = total capital costs
- Q = number of pupil-places to be built

$\dot{Q}$  = number of resident-places to be built for students  
 $\bar{Q}$  = number of resident places to be built for teachers

The computation of the number of places to be built ( $Q$ ,  $\dot{Q}$ ,  $\bar{Q}$ ) in any year would be simple indeed if it could be assumed that the building period were one year.

UNESCO has applied following formulae for preparation of an Asian Model of Educational Development-prospective plan: 1960-80 for calculation of unit capital costs for schools:-

Formula ( D-15)

$$U_y^{t.g} = U_a^{t.g} + C_y^{t.g} q_y^{t.g} + uk_y^{t.g}$$

where:-

- $U_a$  = cost-per-pupil place for site for schools
- $C$  = cost per unit area (square metres ) for building schools
- $q$  = per-pupil-place area requirements ( square metres) for building schools
- $uk$  = cost-per-pupil place for furniture and equipment etc. for schools

The calculation of unit capital cost for student residence has been obtained by:-

Formula (D-16) 
$$U_y^{t.g} = U_a^{t.g} + C_y^{t.g} q_y^{t.g} + Uk_y^{t.g}$$

Where :-

- $U_a$  = cost-per-residence-place for site for student residences
- $i$  = cost-per-unit area (square meters ) for building student residences
- $\dot{q}$  = per-resident- place area requirements (square meters )for building student residences
- $Uk$  = cost per resident-place for furniture and equipment etc. for student residences.

Here  $\dot{C}$  is equal to  $C_g + C_h$  and  $\dot{q}$  is equal to  $q_g + q_h$  and  $Uk$  equal to  $Ug + Uh$  of the preceding formulae.

Total capital cost were computed by :

$$U_y^{t.g} = U_y^{t.g} \left[ \frac{E_y^{t.g}}{E_{y+1}^{t.g}} - (1-x)y^{t.g} \right] + U_y^{t.g} \frac{E_y^{t.g}}{E_y^{t.g}}$$

Where :  $x$  = proportion of existing pupil-places to be replaced for the following years.  $E$  = Enrolment

$\bar{U}$  = proportion of students in student residences.

$U$  = per student places capital cost for student residences.

It will be seen that the formula (16) incorporates elements of formulae

D.11, D.12 and D.13. Here no provision for the residence for teachers has been made in the Asian Model.

Finally total costs were computed by :-

Formula (D-17 )

$$W_y^{t.g} = V_y^{t.g} + U_y^{t.g}$$

which is identical to formula D.14.

References:

1. A. Adelman, A linear programming model of Educational Planning: A case study of Argentina in I. Adelman and E. Thorbecke (Eds), The theory and design of Economic Development, Johns Hopkins Press, Baltimore, 1966, pp. 385-412.
2. C. S. Jenson, (ed) Perspectives on Economics of Education, Readings in School Finance and Management, Houghton Mifflin, Boston, 1963.
3. J. Burkhead, Public School Finance: Economics and Politics Syracuse

4. J.D. Chesswas, Methodologies of Educational Planning for Developing Countries( Two Volumes ) UNESCO, Paris, 1969.
5. F. Edding, International Development of Educational Expenditure: 1950-65, UNESCO, 1969.
6. W.L.Kendall, Statistics of Education in Developing Countries- Statistical Reports and Studies, UNESCO, Paris, 1968.
7. W. A. Lewis, Economic aspects of quality in Education. Lecture discussion series No. 7, I.I.E.P., UNESCO, Paris, 1966.
8. H. N. Pandit, Economic Approaches to Investment decision making in Education. Indian Educational Review, Vol.5, No.1, NCERT, New Delhi, Jan.1970.
9. U.N.E.S.C.O., An Asian Model of Educational Development: Perspectives for 1965-1980, 1966. Paris.
10. Ibid, Economic and Social Aspects of Education, Paris, 1964
11. J. Vaizey, and J. D. Chesswas, The Costing of Educational Plans, UNESCO, Paris, 1968.
12. J. Versluis, (Ed) Mathematical Models of Educational Planning UNESCO and Netherlands' Economics Institute, Rotterdam, 1966.

E D U C A T I O N A L     S T A T I S T I C S

I N

I N D I A

XI. Historical Perspective	80
XII. Sources	87
XIII. Flow of Data	95
XIV. Coverage	99
XV. Publications	107
XVI. Major Gaps and Suggestions	118



## CHAPTER XI

### HISTORICAL PERSPECTIVE

Ministry of Education is the oldest source of information and by all means the most comprehensive too. It has been collecting and publishing a large volume of educational statistics for more than a hundred years. The first comprehensive account of educational development in India, with necessary statistics was brought out by the Central Government in 1864-65. This was followed by a far more detailed account in 1870-71. The Indian Education Commission of 1881-82 published even more detailed educational statistics for the year 1881-82. Since then educational statistics have been collected and published in the quinquennial reviews of progress of Education in India for 1886, 1892-97, 1897-1902, 1902-07, 1907-12, 1912-17, 1917-22, 1922-27, 1927-32 and 1932-37 and the Decennial Review 1937-47. Since 1943-44, annual statistics also began to be collected and published. These were not so elaborate as quinquennial statistics, but they contained a good deal of very useful data.

As might naturally be anticipated, the forms in which these statistics were collected have been changed on several occasions. Without going into the details of these revisions, it may be stated that the most significant revision was carried out in 1911-12. Elaborate historical study can be made by dividing the period in three parts:

- a/ Upto 1947
- b/ From 1947-1960
- c/ From 1961 onwards.

#### Period upto 1947:

The main difficulty with the statistics of this period is that the area covered by them varies from time to time. The earlier statistics include British Burma upto 1937. Statistics on education in some of the erstwhile princely states were included till 1911-12 and were totally discontinued with effect from 1916-17. Owing to these changes in the area covered, the statistics of this period are not strictly comparable. Nor did they cover the entire country at any time.

#### From 1947-1960:

In the post-independence period, Form A which was introduced in 1949-50, is the most significant landmark and contains the most comprehensive and complete set of statistics ever collected in India. Educational statistics in this form have been collected annually ever since 1949-50 and published, with appropriate commentaries, in "Education in India" Vol. I and Vol. II, which is the most important statistical publication of the Ministry of Education.

With the adoption of Form- A, the distinction between annual and quinquennial educational statistics disappeared.

But the data thus annually collected was far more comprehensive than even quinquennial data collected in the British period. However, the statistics of the British period as well as the Form A of 1949-50 were designed essentially to assess the progress of education in India. With the adoption of the planning technique in 1951, the situation changed completely and the system of educational statistics evolved in the past appeared to suffer from two main defects

- i) the data collected were rather inadequate and lacking in a good deal of significant information; and
- ii) there was generally a time-lag<sup>of</sup> about three to four years between the date to which the statistics related and their publication.

These deficiencies seriously reduced the utility of these statistics for purposes of educational planning and day-to-day administration. The Ministry of education, therefore, made the first exercise in revising the Form A in 1957-58 and a new form was designed which covered much larger ground than the form of 1949-50. The extent of the expansion visualised may be imagined from the fact that the revised form was about double the size of the Form A of 1949-50. This form was discussed with the State Government but it could not be adopted for two main reasons:

- a/ The first was the fear that the adoption of new form would further increase the time-lag in the publication of educational statistics; and
- b/ Secondly, the State Government felt that they would not be able to collect the data in the new form unless the staff of their statistical units was substantially increased. The matter was, therefore, shelved.

From 1961 onwards:

The period from 1961 onwards is the landmark for the progress and development of educational statistics on the modern lines. It was also only during this period that two main <sup>other</sup> agencies at National level started collection of educational statistics in addition to <sup>the</sup> Ministry of Education and those were:

- a/ University Grants Commission; and
- b/ National Council of Educational Research and Training.

The other main features of this period in the Ministry of Education are:

82/-

- a/ Revision of Form-A.
- b/ Four National seminars on Educational Statistics
- c/ All India workshop on Educational Statistics
- d/ Reorganisation of Statistical Branch of Ministry of Education
- e/ Standing Advisory Committee on Educational Statistics
- f/ Co-ordination to avoid duplication between U.G.C. and Ministry of Education in collection of statistics of Universities in India.

i/ Revision of Form-A:

Towards the end of the second plan, however, the subject of revising Form-A was taken up again. The earlier attempt had shown that a reform of the system of collecting educational statistics stood on the horns of a dilemma. On the one hand, more detailed

and varied data were needed and if due justice was to be done to this demand, the time-lag in the collection and publication would increase considerably. On the other hand, the relevant data had to be made available as quickly as possible.

In short, the problem to be faced was how to get more information in shorter time; and it was inter-alia for the examination of this issue that the first National Seminar on educational statistics was convened in September, 1962. The seminar examined the whole problem in details and on the basis of these discussions the following principles were adopted for the revision of Form A:

- i/ The total volume of educational data required should be divided into four groups- Form A, Form A-1, Form A-2 and periodical studies- and the compilation of the data should be staggered over the whole year.
- ii/ The new Form A should contain the minimum essential data which would be broadly comparable with that now collected in the existing Form A.
- iii/ Form A-1 should contain the essential educational data in respect of children of the scheduled castes and the scheduled tribes, as they are badly needed for Planning the educational development of these weaker sections of the community.
- iv/ Form A-2 should contain the supplementary data which are needed for purposes of planning. In order to save time, personnel and money, however, all this data need not necessarily be collected for the entire area of the country. It would be sufficient to collect most of the statistics included in it for selected samples of 1 to 10 percent.
- v/ Every year, three studies on different aspects of education should be organised. The States should collect the data in the required proforma and their analysis and interpretation should be done in the Ministry of Education.

On the basis of the above recommendations, the Ministry of Education, therefore, finalised the new scheme and decided to bring it into force from March 31, 1965. In addition to this the publication entitled "Education in India" Vol. II was bifurcated in two parts, Vol. II and Volume II-A. This publication had four appendices- three dealing with the salaries and allowances of primary, middle and secondary teachers and the fourth dealing with the strength of the Directorate and Inspectorate in the States. This data could be easily collected within one or two months from the

States. But the mere fact of its inclusion in Vol.II, whose statistical tables could not be compiled in less than three years delayed its publications by about the same period. This led to the publication and collection of these four appendices together in a separate volume, numbered Vol.II-A.

ii/ Origin of other agencies in collection of statistics:

During this period two other national agencies came into being and started collection of certain educational statistics in addition to its collection by Ministry of Education. The coverage and by these agencies was only need oriented / limited to specific fields. Following are the major two such national agencies:

a/ University Grants Commission:

The University Grants Commission started collection of educational statistics on a systematic basis from the academic session 1961-62. Since then it collects information from Universities and colleges affiliated to them through form: B-4. The statistics pertain to those courses for which the ~~minimum~~ qualification for admission is matriculation or school leaving Certificate examination

• Irrespective of the fact whether the course is affiliated to a University or to a Board or is recognised by the government. It does not collect information about lower courses of study.

Unlike Ministry of Education, U.G.C. has contended itself only to collection of information regarding enrolment and teachers and not expenditure about This way, it has given rise to overlapping in collection of data from universities and colleges at national level.

b/ National Council of Educational Research and Training:

The National Council of Educational Research and Training was set up in 1961 as an autonomous organisation, under Government of India, Ministry of Education. The Council has established the National Institute of Education to carry out its objectives. The Council, besides the qualitative assessments, has also undertaken some statistical observations at National level.

The First Education Survey was undertaken by the Ministry of Education in 1960 but the Second Education Survey was conducted by N.C.E.R.T. in 1965 on census basis by creating separate machinery both at National and State levels without any co-ordination with the set-up already collecting data for Form A for Ministry of Education on continuous basis.

This way, it has given rise to wide variations in the final figures produced separately by Ministry of Education

Workshop, Form A, A-1, A-2, Form B and B-1 were elaborately discussed and suggestions were made to simplify these forms.

iv) Reorganisation of the Statistical Unit in the Ministry of Education.

A Committee was appointed in June, 1968 by the Ministry of Education with Mr. J. P. Naik as its chairman to suggest the broad direction of development of the Statistical Unit of Ministry of Education <sup>to meet the requirements of education</sup> administration and planning and to indicate the structure and staffing pattern necessary for the expanded scope of work of the Unit. This Committee submitted its report in 1969 and suggested that the present Unit should be reorganised as " Division of Statistics and Information " to be headed by an officer of sufficient competence and adequate status. In this Division following five cells should be there:

- a/ A cell to deal with the statistics collected in Form A.
- b/ A cell to deal with the statistics of Form B
- c/ A cell to deal with special studies, projection and co-ordination with other agencies collecting educational and man-power statistics.
- d/ A cell for administrative intelligence needed for policy formulation and planning
- e/ A cell for information services for students.

All the above suggestions were accepted by the Government and now there is a ' Division of Statistics and Information ' headed by a Director and Deputy Director.

v) Standing Advisory Committee on Educational Statistics

On the recommendation of the Reorganisation Committee, a Standing Advisory Committee on Educational Statistics has been constituted with representatives from Ministry of Education, U.G.C. and C.S.O. as its members. This Committee shall examine all the proposals for taking up special studies from time to time by the Statistics and Information Division. It will also suggest steps to avoid duplication involved in collection of educational statistics.

vi) Transfer of Form-B to University Grants Commission.

On the recommendations of the above mentioned Reorganisation Committee, it has been decided that the collection and consolidation of Form-B and publication 'Universities in India' will be transferred to University Grants Commission from 1969-1970 onwards. This is a remarkable step to avoid duplication and over-lap in collection of educational statistics from universities at national level.

References

1. Institute of Applied Manpower Research, Guide to Educational and Training Statistics(draft) Working Paper No. 6, New Delhi, 1967.
2. Q. U. Khan, Statistics for Educational Planning, Manpower Journal, Vol. 4, No. 4, I.A.M.R., New Delhi, October-December, 1968.
3. Ministry of Education and Youth Services, Manual of Educational Statistics, New Delhi, 1964.
4. Ibdo, Report of Ist Seminar on Educational Statistics, 1964.
5. Ibdo, Report of IInd Seminar on Educational Statistics, 1964
6. Ibido, Report of 4th Seminar on Educational Statistics, 1968
7. Ibido, Report of Workshop on Educational Statistics, 1969
8. Ibido, Report of Committee on Re-organisation of Statistical Unit, 1969
9. Ibido, Report of 3rd Seminar on Educational Statistics, 1965
10. National Council of Educational Research and Trainings, Second Educational Survey of India, Guide Lines for Survey Officers, Education Survey Unit, NCERT, New Delhi, 1964
11. V. Vishwanath, Statistical Activities on U.G.C. Lecture delivered in C.S.O. of India, New Delhi, Feb. 1970.

CHAPTER XII

SOURCES

To have an elaborate study of sources of educational statistics in India, the different sources can be grouped under following two heads:

I/ Regular Educational Statistics &

- a/ Ministry of Education & Youth Services
- b/ University Grants Commission

II/ For Ad-hoc Educational Statistics

- a/ National Council of Educational Research and Training
- b/ Census of India
- c/ National Sample Survey
- d/ Central Statistical Organisation
- e/ Institute of Applied Manpower Research
- f/ Planning Commission
- d/ Directorate General of Employment and Trainings
- h/ Other minor sources:

- i) The Medical Council of India
- ii) The Dental Council of India
- iii) The Indian Nursing Council
- iv) The Pharmacy Council of India
- v) The Indian Council of Agriculture

I/ For regular Educational Statistics

A) Ministry of Education & Youth Services:

The collection of educational statistics for all India purposes is done by the Union Ministry of Education and Youth Services. According to the Indian Constitution, Education is a State subject. Broadly speaking, the Central Government is responsible only to plan, to coordinate and to guide educational activity in the Country. Statistics being the basis for Planning is very important element in matters relating to coordination and sometimes useful in providing guidance, for effective discharge of the central responsibility in this field. In order to discharge its responsibility adequately, the Ministry of Education collects the necessary educational statistics from the country in the prescribed forms. The main sources of its information are the Education Departments of the State Governments/ Union Administrations and the Universities.

ORGANISATION:

a) At National level In the Ministry of Education and Youth Services, there is a separate wing called ' Division of Statistics & Information. This Division is headed by an officer of the rank of a Director and Deputy Director in the Indian Statistical Service.

This Division has five following cells:

- i/ A cell to deal with the Statistics collected in Form-A
- ii/ A cell to deal with the Statistics collected in Form-B
- iii/ A cell to deal with the social studies, projections and co-ordination with other agencies collecting educational and manpower statistics.
- iv/ A cell for Administrative intelligence needed for policy formulation and planning.
- v/ A cell for information services for students.

From the State Governments, Union Administrations and Universities, the Statistics are collected on the following forms:

- i/ Form: A: This is the most important form of educational statistics with which Ministry of Education is concerned. This form covers the entire educational system in the State, right from the pre-primary to the post-graduate and doctorate level. Moreover, it is a record of a total count, inter alia of all the recognised educational institutions, students, teachers, educational expenditure, output etc.
- ii/ Form: A-1 : It contains the minimum essential data in respect of children of the scheduled castes and scheduled tribes, as these are needed for planning the educational development of the weaker sections of the community.
- iii/ Form: A-2 : It contains the supplementary data which is needed for purposes of Planning. In order to save time, personnel and money, however, all this data may not be based on census study but on a sample study of 1 to 10 percent.
- iv) Form-A-3 : This form is used only for quinquennial of districtwise educational statistics in India. First such study was undertaken in 1960 and the second in 1965.
- v/ Form A-4: It is used for collection of data by States from institutions of higher study recognised by bodies other than the Universities.
- vi/ Form-B : This form is used to collect data from all the universities of India and is the most comprehensive in coverage.
- vii/ Form B-1 : This form is used by both States and Centre to collect data from the recognised colleges by the universities of India.

b/ At State Level:

Starting from the educational institutions and before reaching the national level, the educational data has to pass through a long channel. In every State, there is a Statistical Unit attached to Education Department. This unit collect a part of data directly from institutions and for the rest of the data, it has to depend upon the district authorities. At the district level also a part of the data is collected directly from the institutions and the rest from the tehsil, taluk office. In few States, there is an additional office between the district office and the State headquarters, called the Regional or the Divisional office. This office shares responsibility either with the district office or the head office or both.

Model Procedure:-

The procedure followed by different States for collection of educational statistics is not uniform. The Ministry of Education has, however, outlined a model procedure which it expects to be followed by all the States with such modifications as may be necessary in view of the peculiar situation in each State. The prescribed model procedure has four stages :-



i/ Finalisation, printing and distribution of primary forms:

Institutions or through the State Departments

It is the responsibility of both centre and States to distribute the blank proforma to basic reporting institutions. To the Universities, colleges and other institutions of higher education, the proforma is supplied by the Ministry of Education under intimation to the State Governments. The proforma for institutions under other departments of State Government are distributed by the statistical unit at the State Headquarters either direct to the concerned as may be convenient. To high and higher secondary schools, teacher training schools, etc, the proforma is sent by the district office and to primary and middle schools by the tehsil/ taluk office. In short, the authority who is responsible for the collection of institutional returns from a particular type of institution is normally be the authority to supply the blank copies of the relevant proforma to that type of institutions.

ii/ Collection of filled in proforma:

This is the most crucial stage in the entire scheme of this work. It appears that the maximum delay occurs at this level. It is kept in mind that no educational institution remains uncovered and that all of them send their returns to the authorities within the reasonable time after the receipt of blank proforma. To the defaulters, it is, therefore, imperative that regular reminders- routine, telegraphic, telephonic where possible, demi-official, etc.- are sent at regular intervals. Not only that efforts are also made even at personal level, where necessary.

iii/ Scrutiny and Reconciliation.

For the accuracy of the data, the returns are scrutinised thoroughly and discrepancies therein, if any, reconciled before they are consolidated. It is tried for convenience that the reconciliation is done at the initial stages.

iv/ Tabulation consolidation and preparation of Form A :

Consolidation of data is done in consolidation registers. As soon as the return is found to be accurate, the posting of data in consolidation registers is started at once. After the data have been posted in consolidation registers, they are tabulated and further posted in Form A, A- 1 and A- 2 which are again totalled.

The Second National Seminar has also prescribed dates for the submission of Form A-1 by 31st December and Form A- 2 by 31st January by the State Governments to the Union Minister of Education.

b/ University Grants Commission:

The University Grants Commission was set up by Government of India under an Act of Parliament in 1956 but it started collection of educational statistics on systematic basis from the academic session 1961-62. To carry on this function of U.G.C., there is a big unit attached to it under the charge of a statistical officer. The major function of this unit is to supply facts and figures as the commission might require in the discharge of its functions.

The U.G.C. collects statistics only of those courses for which the minimum qualification for admission is matriculation

Moreover, such courses must be affiliated to university or to a Board or recognised by the government. No information regarding lower courses of study is collected.

The main proforma used by U.G.C. for collection of data is Form B-4. This Form B-4 is also of two types- one is meant for Universities and the other for affiliated colleges. The coverage, at present is confined to only three typical items i.e. enrolment, teaching staff, residential facilities for students and teachers. For all types of other data relating to number of students receiving financial assistance, number of foreign students receiving education in India, income and expenditure statistics, the data published by Ministry of Education is being utilised for purpose of analysis, identifications of trends etc.

As already mentioned, there is a good deal of overlap between the data published by Ministry of Education and that published by U.G.C. It was quite all right for the Ministry to have started collection and publication of such data at a time when the U.G.C. did not exist. But now, the U.G.C. has come into existence and has developed a very effective statistical organisation. Keeping in view these facts, based upon the recommendations of the Committee on Reorganisation of Statistical Unit of the Ministry of Education, it has been decided that the publication "Universities Education in India" be transferred from Ministry of Education to U.G.C. from 1969-70 onwards.

## II. For Ad-hoc Educational Statistics:

### a/ National Council of Educational Research and Training:

The National Council of Educational Research and Training was set-up in September, 1961 as an autonomous organisation, under the Government of India, Ministry of Education. The Council has established the National Institute of Education to carry out its objectives. There are several departments and units in the N.I.E., such as Data Processing and Education Survey Unit, Psychological and Philosophical Foundations of Education, Department of Teacher Education, Department of teaching aids, Department of Science Education, Department of Primary and Pre-primary Education, Department of Social Science etc.

One of the main objectives of Council is to undertake special studies, surveys and investigations. Besides the qualitative assessments, it has also undertaken some statistical compilations. The Data Processing and Educational survey Unit is specifically meant for this purpose. This unit has two wings, viz i/ the data processing wing; and ii/ the Education Survey wing.

While the Data processing wing was part of the erstwhile Department of Psychological Foundations, the Educational Survey wing

functioning as an independent unit since it was established in 1965 for conducting second All India Educational Survey for school Education only.

The Data Processing Wing is responsible for processing of the data pertaining to various research studies and investigations of different departments of N.I.E.

b/ Census of India:

The first census of population in India was conducted in the year 1872 but the systematic start was made only in 1881. The latest

census, the second after Independence, took place in 1961. Information on level of literacy of population has been collected from 1881. However, the concept and definition of literacy has not remained uniform in all the census counts. For example, in the latest two censuses of 1951 and 1961, the definition of literacy was not the same. In the 1951 census, a person who could read and write a simple letter in any language was treated as literate but all children aged four or below were treated as illiterate. In the 1961 census the test of literacy was whether a person above the age of four could with understanding both read and write.

Census data upto 1941 provide information only about literacy, the latest two censuses of 1951 and 1961 also give the educational standards of the population. In the 1951 census, information on educational standards was tabulated for 10% sample but in 1961 this has been given for the total population. The 1961 census made a special enumeration of the scientific and technical personnel possessing a degree or diploma in science, engineering, technology or medicine. For this purpose a special card called 'S & T Card' was introduced.

c/ National Sample Surveys:

It was in 1950, that an organisation like National Sample Surveys was initiated to undertake large scale sample surveys to collect essential data to fill the serious gaps in the available statistical information specially in the socio-economic field.

The N.S.S. collects data in rounds which vary in durations. So far 26 rounds have been completed. The reference period is also not uniform in all the rounds of the N.S.S. and for all items of information in one single round. The reference period varies from a day to a month.

Although the N. S. S. was started in 1950, yet questions regarding educational levels of persons were included in the N.S.S. questionnaire only from 1953 onwards. The analysis of educational

The information is presented with respect

characteristics of populations is available only in some of the N.S.S. reports to the sampled population in the form of percentage distribution for broad educational standards with bases of sex, activity, status, age-groups, etc. The characteristics analysed in different surveys are not uniform and the grouping of educational standards has also been changing from report to report.

d/ Central Statistical Organisation:

The Central Statistical Organisation (C.S.O.) was set up in 1951 in the Cabinet Secretariat with co-ordinating and advisory functions, i.e., co-ordination of statistical activities at centre and States and advisory work relating to statistical matters at national level.

Its work in the field of educational statistics is limited only to collection of data from various agencies like Ministry of Education and U.G.C. This data is collected for incorporation in the annual publication, The Statistical Abstract of India. Manpower Research Division of C.S.O. undertakes the above work which is of very preliminary nature.

e/ Institute of Applied Manpower Research:

The Institute of Applied Manpower Research was set-up in 1962 by the Government of India to conduct research on problems of manpower planning. Following main projects have been undertaken by this Institute:-

i/ Manpower Group Survey:

Under these surveys many projects dealing with engineering, medical and public health and to a limited extent managerial manpower have been completed. A few reports and working papers of these manpower group surveys contain educational and training statistics. Currently the agricultural manpower survey is in progress.

ii/ Area Manpower Surveys:

This survey was conducted in Meerut district of Uttar Pradesh to obtain an up-to-date picture of the existing manpower situation at district level and to focus attention on the problems it poses for its future development. It was realised that the manpower situation in country or local area is essentially the result of interplay of (a) demographic, (b) educational and (c) employment forces. As such three detailed reports, one each on the above cited subjects, were prepared beside the General Report which gives a general survey of demographic, educational and employment situation in the district.

iii/ Ad-hoc studies :

A number of ad-hoc studies have been completed. In the field of education, we may mention these studies which were prepared for the education commission of 1964-66.

The statistics contained in the publications of the Institute are generally of secondary nature and it is only in few publications that primary statistics collected through some field surveys are given.

f/ Planning Commission:

There is a separate Education Division in the Planning Commission dealing with educational planning at the national level. It is specifically concerned with the educational statistics needed for planning purposes- all of which of secondary nature and collected either directly from States or U.G.C. or Ministry of Education. It has also brought out two important publications for ready reference in educational statistics.

g/ Directorate General of Employment and Training:

The Directorate General of Employment and Training (DGE and T) constitutes the central Headquarter of National Employment Service as well as of the craftsman training scheme of the Ministry of labour and employment, Government of India.

It regularly collects statistics relating to training facilities in the country in the prescribed proforma from employment exchange officers of all employment exchanges in the country. This information is consolidated at State and All India levels for publication in 'Handbooks of Training Facilities'. It is difficult exactly to pin point the time for which the information contained in any issue of the Handbooks pertains. The information is generally spread over a long period sometimes extending to a couple of years. The proformae do not insist on any reference period and as such all the information received since the time of initiation of the scheme till the compilation of the publication is incorporated. Another drawback of these Handbooks is the incomplete coverage because the collection of data is on voluntary basis.

h/ Other Minor Sources:

In addition to the above mentioned sources there are also other agencies who collect and compile educational and training statistics meant for their own purposes. Some of them are as follows:

- i/ The Medical Council of India maintains statistics pertaining to institution, intake, out-turn and other allied information relating to medical education in the country.
- ii/ The Dental Council of India, The India Nursing Council and the Pharmacy Council of India collect and maintain statistics on dental, nursing and pharmaceutical education respectively on similar items of information.
- iii/ The India Council of Agriculture Research maintains statistics regarding the agricultural and veterinary education.

These above agencies do not bring out any regular publications and the data are available with them in cyclostyled form.

References

1. Institute of Applied Manpower Research, A Guide to Educational and Training Statistics(draft), Working Paper No. 6, New Delhi, 1967. . .
2. Q. U. Khan, Statistics for Educational Planning, Manpower Journal, Vol. 4, No. 4, I.A.M.R. New Delhi, Oct.-Dec.-1963.
3. Ministry of Education and Youth Services, Manual of Educational Statistics: India, New Delhi, 1964.
4. National Council of Educational Research and Trainings, Second Educational Survey of India, Guidelines for Survey Officers, Education Survey Unit, NCERT, New Delhi, 1964.

Chapter : XIII

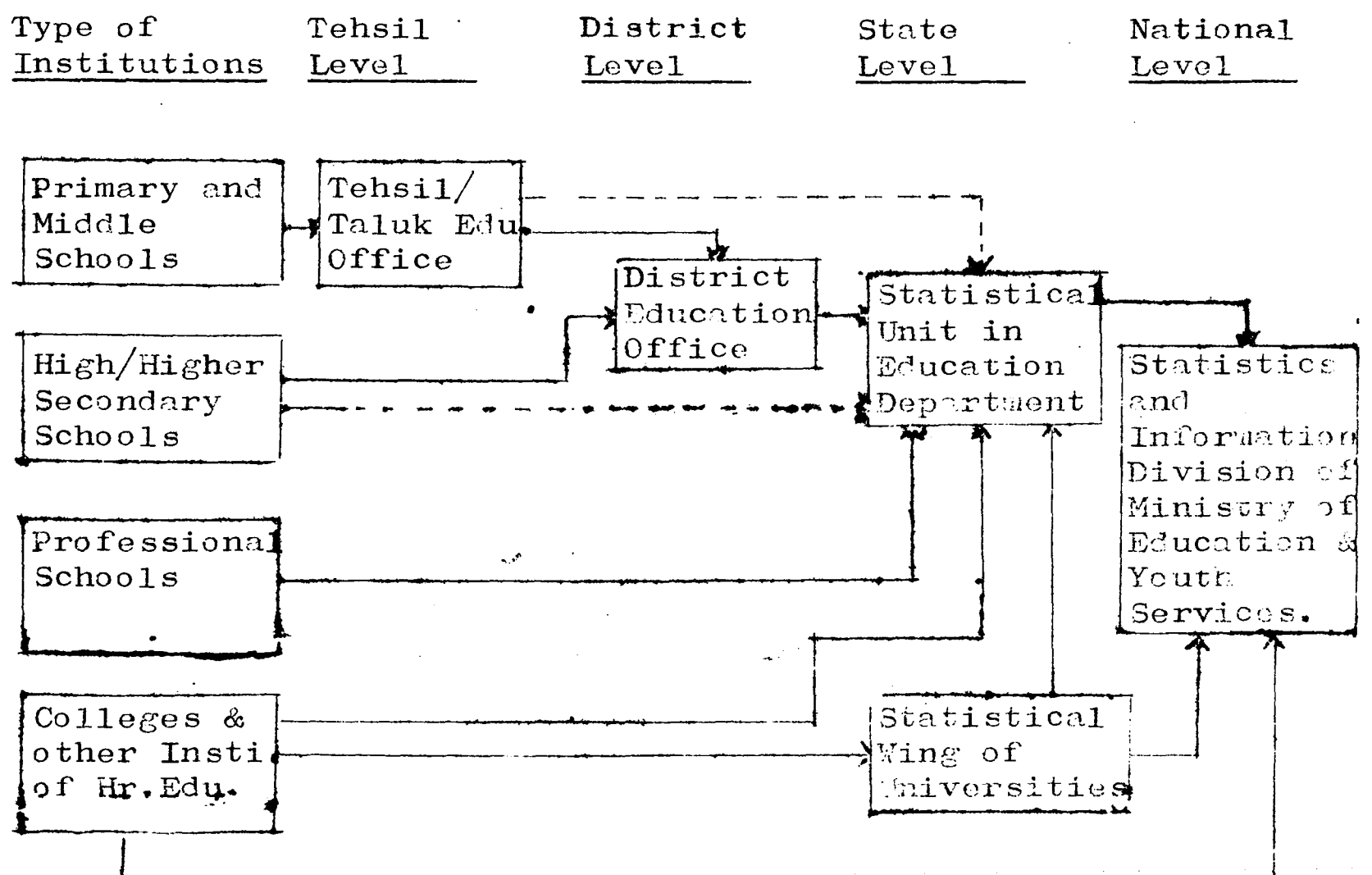
F L O W O F D A T A

Starting from the educational institution and before reaching the National level, the educational data have to pass through a long channel. University Grants Commission has a centralised system of collection while Ministry of Education has a decentralised system. Other agencies dealing in educational statistics at the National level either make use of the published data or collect the data from the field directly. Following are the channels of flow of data for different agencies at National level:

A/ Ministry of Education and Youth Services:

As already mentioned that the Ministry of Education collects educational statistics from the State Departments of Education and the Universities. The channel in which data flows from institutions to National headquarters is as under:

DIAGRAM: VIII DATA FLOW CHART OF  
MINISTRY OF EDUCATION & YOUTH SERVICES



Each State Government has a statistical unit in the Education Department as its headquarters. A part of the data are collected by them directly from the institutions, while for the rest they have to depend upon the district authorities. At the district level also a part of the data are collected directly from the institutions and the rest from the Tehsil/ Taluk office. This office however, collects the entire data with which it is concerned from the field without the help of any intermediary agency. In few States, there is an additional office between the district office and the State headquarters, called the Regional or the Divisional office. This office shares responsibility with either the district office or the Head office or both.

It may be mentioned that the procedure followed by the different States for the collection of educational statistics is not uniform. In some of the States the system of collection of data is centralised while in most of the States it is decentralised. In case of primary and middle schools, almost in all the States of India, Tehsil/ Taluk Education offices are responsible for the collection of data. In some of the States, agencies at the district level collect data from all the institutions in that district. There are other States also where at district level no consolidation work is done and the data passes directly from Tehsil/ Taluk office and all other types of institutions directly to State Headquarters. Blank forms for collection of data are distributed by the concerned State Governments to all types of institutions except colleges who directly receive Form B-1 from the Union Ministry of Education.

In case of colleges, the procedure is somewhat different. Every year they receive five copies of Form B-1 from the Ministry of Education. The affiliated colleges prepare all the copies of Form B-1 and send two copies out of them to the affiliating University, one copy to the University Grants Commission, one copy to the Education Department of the State Government/ Union Administration and one copy is kept by college itself as office record. The relative portion of Form B-1 is consolidated by the State Education Department for incorporation in Form A. Similarly part of the Form B-1 is consolidated by the Universities to prepare Form B for submission along with one copy of Form B-1 of each of its affiliated colleges to Ministry of Education. The statistics contained in Form B-1 which pertain to individual colleges have not been consolidated.



Collegewise uptill the year 1965-66. The date of reference for all type of data is 31st of March every year.

B/ University Grants Commission:

As already stated, U.G.C. has a centralised system of collection of data from its primary reporters i.e. universities and affiliated colleges, so the channel of flow of data is very short as is clear from the following chart:-

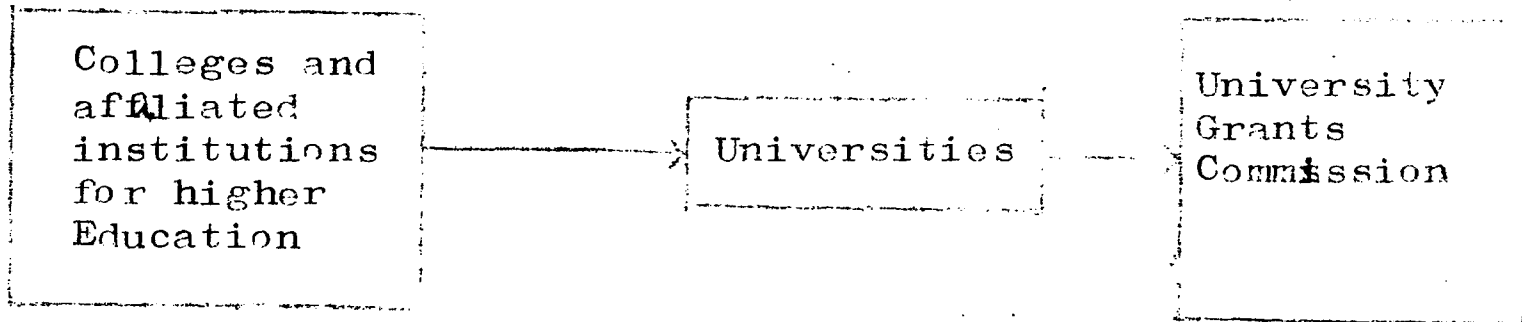


DIAGRAM IX : DATA FLOW CHART OF UNIVERSITY GRANTS COMMISSION

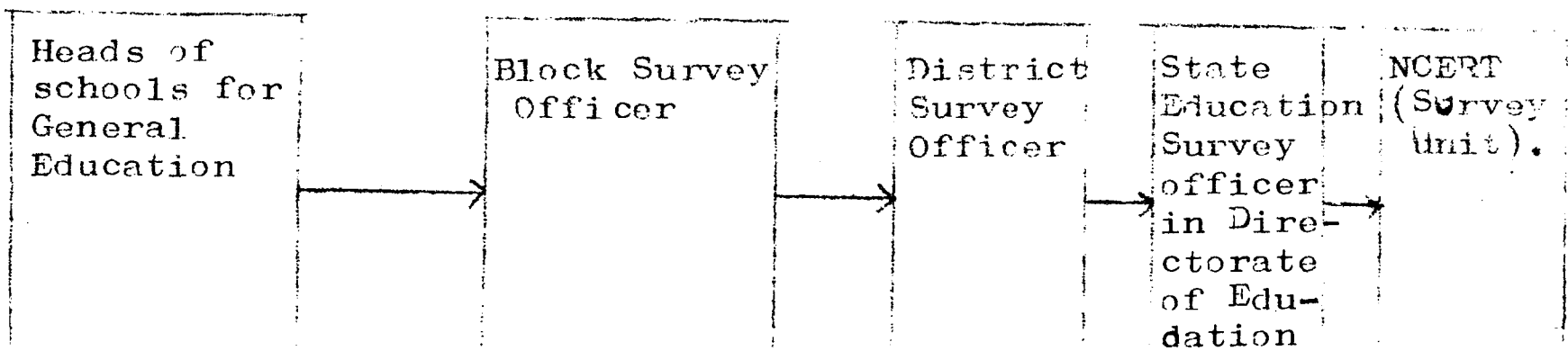
U. G. C. directly collects data from universities and other recognised institutions for higher education in Form B-4 designed separately for both of them. The date of reference for the supply of data is 15th of August every xxxxxx year. In addition to Form B-4, U.G.C. also receives a copy of Form B-1 from the institutions along with the Ministry of Education, but no special use is made of this ~~serve~~ xxxxxx as a copy for information.

C/ National Council of Educational Research and Training

At national level, N.C.E.R.T. has undertaken only one census survey of school education in India in 1965 named Second All India Education Survey. The first All India Education Survey was conducted by the Ministry of Education in 1957.

The channels adopted for the flow of data for this survey are shown as under:-

DIAGRAM X : DATA FLOW CHART OF N. C. E. R. T.



For other types of surveys in the field of education, N.C.E.R.T. collects data either through State Directorates of Education or State Institutes of Education or extension Units attached to different T.T. Colleges almost in every State/ Union Administrations.

D/ Other Organisations:

All other organisations collecting educational Statistics either for their own use or for special studies and surveys, the centralised system of collection is adopted. Instead of collecting data through post, personal collection from the primary reporters is given preference. Data collected is mostly based on sample surveys and not <sup>on</sup> ~~on~~ census surveys.

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References

1. Ministry of Education and Youth Services, Manual of Educational Statistics, India, New Delhi, 1964.
2. National Council of Educational Research and Trainings, Second All India Educational Survey, 1967, New Delhi.
3. V. Vishwanath, Statistical Activities of U.G.C. Lecture delivered in S.S.O. of India, New Delhi, Feb. 1970.

CHAPTER XLV

C O V E R A G E

The collection of educational statistics in India is being done on a quite comprehensive basis. In fact, as far as the comprehensiveness of coverage is concerned, India is among the few countries in the world who are in the fore-front.

Coverage of Indian educational statistics can be studied more elaborately by describing the contents of different forms used for collection of data by different national agencies collecting educational statistics on regular basis every year.

I - Ministry of Education & Youth Services.

As already stated, the Ministry of Education and Youth Services collects educational statistics from States/ Union Administrations and Universities in India through Form A, A-1, A-2 and Form B. These forms are very comprehensive in coverage as is clear from the following account of each of them.

Form- A

This form contains information for every type of recognised Institution in India right from pre-primary stage to University stage and that too for every aspect i.e. enrolment, teachers, expenditure and other miscellaneous items.

Institutions:

"An educational institution is a group of pupils (students) of one or more grades organised to receive instruction under one teacher, ~~or under more than one teacher including an immediate head~~, or under more than one teacher including an immediate head". Guided by this definition, table I of Form A is meant to show all the recognised educational institutions located in the State. It also records the number of hostels attached to these institutions and number of teachers working in these institutions. This information is to be reported as on 31st March of the financial year for which the Statistics are compiled.

Classification of Institutions:

The table I of Form A is a two-way table. On the one hand the institutions are classified according to management.

A/ Classification by Management:

- i/ Government/ Government sponsored
  - a) Central Government
  - b) State Government.
- ii/ Local bodies
- iii/ University/ Board
- iv/ Private Bodies
  - a) Aided
  - b) Unided.

Classification by Type of Courses:

- i/ Colleges for General Education
  - a) Degree and Post Graduate level.
  - b) Under- Graduate level
- ii/ Colleges for Professional Education
  - a) Degree and Post-Graduate level
  - b) Under-Graduate level
- iii/ Colleges for other Education
  - a) Degree, Post-Graduate and under graduate level.
- iv/ Schools for General Education
- v/ Schools for Professional/ Vocational Education
- vi/ Schools for Special Education
- vii/ Schools for other Education

c/ Classification sex-wise

All the above classifications and sub-classification numbering upto 70, have been divided sex-wise as:

- i) For Boys- including purely for boys and co-education institutions
- ii) For Girls- Institutions meant only for girls.

D/ Attached classes and attached Hostels:

Number of attached hostels; <sup>of</sup> sex-wise, has been shown against every type/institutions. Similarly, number of attached classes by type and level of education is shown for every classifications.

Enrolment:

a  
'A pupil(Student) is person enrolled in an educational institution for systematic instructions'. Following this definitions of a student, enrolment is given sex-wise in Table II and III for all above classifications and in attached classes alongwith number of students in hostels.

- a) Table II gives enrolment institution-wise
  - Table II-A: For Boy's Institutions
  - Table II-B: For Girls' Institutions
- b) Table III gives enrolment by courses of study, stage/ classes and by age-group.
  - Table III-A: For General Education (College level)
  - Table III-B: For professional and other Education (College level)
  - Table III-C: age-wise distribution of enrolment for collegiate education only.
  - Table III-D: age-wise distribution of school level education only (General Education)
  - Table III-E: Enrolment for courses in professional education (School level)
  - Table III-F: age-wise distribution of enrolment given in table III-E.

Teachers:

'A teacher is person who is directly engaged in instructing a group of pupils'. The information about teachers is very comprehensive and is given in Table IV.

- a) Table IV A: gives teachers working in schools for general education only according to type of institutions in which they are employed.
- b) Table IV B: deals with teachers teaching school classes of general education, by stages.

Table IV also deals with division of teachers as:

- a) Trained; and ( b) untrained  
Teachers again have been divided sex-wise and qualification-wise under sub-heads.
- a) Post-graduate (b) Graduate
- c) FA/Matric (d) Non-Matriculates

Age wise and salary-wise distribution of teachers is given in Form A-2

Expenditure:

" All payments made by an institution strictly during the financial year will constitute its expenditure". It will, however, exclude following items.

- a) Refundable security deposits such as library deposits, laboratory caution money, hostel caution money, etc.
- b) Money collected on behalf of other authorities such as State Government, Universities, which is ultimately to be passed on to those authorities, such as University/ Board registration fee, university/ Board examination fee, etc.
- c) Fees collected from some of the students for providing specific services to them, such as bus fee, etc.
- d) Re-payment of loans (interest on loans paid by the institutions, however, is considered to be as an expenditure).

Table V and Table VI give expenditure separately for all classifications of institutions. Expenditure has been divided in two parts:

- a) Direct expenditure ; and
- b) Indirect expenditure.

The direct expenditure on education is incurred directly for running the educational institutions. It is of recurring and essential nature. Broadly speaking, it includes expenditure

- on i) Salaries of Staff;
- ii) Contingencies ;
- iii) Recurring expenditure on equipment and maintenance of building; and
- iv) Games and examinations etc.

The " indirect educational expenditure" covers expenditure on:

- a) Direction;
- b) Inspection;
- c) Building (other than maintenance) ;
- d) Non-recurring equipment;
- e) Scholarships, stipends and other financial concessions; and
- f) Hostel charges (excluding mess charges etc).

Table V is specifically meant for information on scholarships/ stipends, other financial assistance and freeships awarded to students in various types of institutions. Information is also to be given according to the sources of finance :

- a) Central/ State Government ;
- b) University Grants Commission
- c) Local Bodies;
- d) University;
- e) Institution itself; and
- f) Endowments and other sources,

Under each agency information is required to be given on number of students getting scholarships etc. and total amount actually disbursed to them.

The statistics on 'direct' as well as 'Indirect' educational expenditure are <sup>also</sup> to be given by sources providing funds for educational expenditure under following classifications:

- a/ Government i) Central  
                  ii) State
- b/ District Boards
- c/ Municipal Boards
- d/ Fees
- e/ Endowments, etc.
- f/ other sources.

The Statistics on 'direct' educational expenditure are also classified by types of institutions (separately for boys institutions and Girls institutions). They are also available for institutions by management.

In addition to the classification by sources, the statistics on indirect educational expenditure are also available by heads of charges. The heads of charges indentified for this classification are:

- a) Direction & Inspection (b) Buildings
- c) Scholarships (d) Hostels and
- (e) other miscellaneous items.

Other Miscellaneous Information:

a) Table VII provides information on institutions located in rural areas only. It contains number of institutions with classification, enrolment and teachers therein, direct expenditure on all types of institutions met from Government funds only, Indirect expenditure under different heads.

b) Table VIII deals with the number of boys and girls appearing regular<sup>ly</sup> and privately and passing the various examination both :

- i/ Annual; and
- ii/ Supplementary

It is concerned only with final examinations.

Form A- I

The data specifically on Scheduled Castes and Scheduled Tribes students are being collected in Form A-I. These are also tabulated and included as a special chapter in Vol. I of 'Education in India'. Mainly, the data collected and published include.

- i/ The number of students enrolled by type of institutions and by sex, separately for scheduled castes and scheduled Tribes;
- ii/ Enrolment of Scheduled Castes and Scheduled Tribes separately by type of education and stage;
- iii/ The number of Scheduled Castes and Scheduled Tribes students benefitting from scholarships, stipends and other financial concessions and also the amount disbursed

- iv) Number of hostels meant for Scheduled Castes/ Scheduled Tribes and number residing in attached hostels.

FORM A-2:

Some special selected detailed statistics are also being collected in Form A-2 from 1964-65. It mainly contains the following information:

- i/ Distribution of primary sections/ classes by number of teachers and enrolment groups. Similar data are available for middle schools/classes and also High schools/ classes.
  - ii/ The enrolment in classes I-VIII distributed by the duration for which the students are attending those classes, e.g., for the first time, for the second time, etc (Stagnation)
  - iii/ Age-distribution of teachers in primary and middle, high/ higher secondary stage and whether trained or untrained.
  - iv/ Distribution of teachers in Primary stage, middle stage and high/ higher secondary stage/ enrolment and management of institutions.
- According to

All the above data are tabulated and published in a detailed form.

Special Information.

Apart from data being collected in Form A, A-1 and A-2, the Ministry of Education and Youth Services also collects and brings out in cyclostyled form every year data on :

- i/ System of school-classes (i.e., giving the details of the number of classes at each stage of education in the different States and Union Territories);
- ii/ Teaching of Hindi, i.e. from which class Hindi is taught as a compulsory (optional) subject of study in the States and Union Territories ;
- iii/ Similar information on English is also collected
- iv/ Public examinations at the general school level existing in different States/ Union Territories;
- v/ State-wise data on free education.
- vi/ State-wise data on compulsory education
- vii/ Pay-scales on 1st January of every year of teachers in primary, middle and high/ higher secondary schools, separately by management and also by classifications and definitions. Attempt is also being made to collect the number of teachers in different pay scales in schools of different managements.

Form B

The data in Form 'B' are collected directly by the Ministry from Universities. The Universities, in their turn, collect the data from their affiliated and constituent colleges in Form B-I. Thus, it can be seen that the data being supplied by different colleges in Form B-I is utilised, by the Universities to compile Form B and by the States to compile Form A. The data supplied in Form A are tabulated and published by the Ministry of Education in "Education in India -Vol.I and II." The data being supplied in Form B and tabulated by the Ministry and published annually in "University

A. General Information:

1. Jurisdiction of the University;
2. Hostels managed by the University; number for boys and girls; Number of rooms etc. available; in-take capacity and number of residents.
3. Medium of instructions and examinations
4. Data on tutorial system and seminar system. This data is neither tabulated nor published.
5. Details regarding physical education; number of playgrounds, etc. This data is also not tabulated and published for
6. Pay-scales of teachers  $\angle$  (University constituent colleges and affiliated colleges separately
7. Rate of dearness allowance and other allowances in the University constituent colleges and affiliated colleges, But this data is neither published nor tabulated.
8. Subjects offered for degrees, diplomas and certificates, faculty-wise.
9. Name of University teaching Departments, constituent and affiliated colleges; their year of foundation; year of affiliation, whether meant for men or Women, .  
Out of it only sex-wise and management-wise composition of the colleges is tabulated and published.
10. Enrolment in general education courses separately for University teaching Departments, constituent colleges and affiliated colleges, by sex and level of education.
11. Enrolment of Scheduled Castes and Scheduled Tribes by level of education and type of education and sex of students.

B. Professional Education.

1. Enrolment in professional education courses separately for university Teaching Departments, constituent colleges and Affiliated colleges, by sex and level of education.
2. Enrolment of scheduled castes and scheduled tribes by level of education and type of education and sex, 1
3. Intake capacity and number admitted by sex in university Teaching Departments and affiliated colleges for professional courses by level and subject of study.
4. Statistics of foreign students; number, subject and level of study and whether they are scholarship-holders.
5. Number of teachers by their designation and type of education in teaching Departments and affiliated and constituent colleges.
6. Distribution of teachers by type of education and sex .
7. Distribution of teachers by type of education, salary groups and whether they are in University teaching departments, constituent colleges and affiliated colleges.
8. Number of students sex-wise appearing for the different final examination; Number passing sex-wise; and sex-wise distribution of students passing by division obtained separately for annual and supplementary examinations.
9. Number of scheduled castes and scheduled tribes students appearing and passing. But this information is not published and tabulated.
10. Scholarships, stipends, etc., awarded to students in the University Teaching Departments, Affiliated colleges and constituent colleges separately by sources of finance-



11. Data separately for Scheduled Castes and Tribes as shown above in item number 10.
12. Income and expenditure of University, its constituent colleges and affiliated colleges classified as recurring and non-recurring and also by source of income and items of expenditure.
13. The number of volumes in the libraries of the colleges, and number added during the year, classified by books, periodicals and other volumes.
14. Recurring and non-recurring expenditure on University library and libraries of constituent and affiliated colleges by items of expenditure.

## II. University Grants Commission:

Two types of Form 'B-4' are utilised by University Grants Commission - one for University Departments and University Colleges and the other for affiliated colleges- for collection of data as on 15th August or the 15th day after the close of admissions, whichever is later.

### Form 'B-4' (for affiliated colleges):

#### I. General Information (Table I).

- a) Name, location, management, name of University to which affiliated, year of establishment, Laboratory and Library facilities, Hostel accommodation with residents, Number of staff quarters separately for teaching staff and other staff.
- b) Degrees/ Diplomas/ certificates for which instruction is provided- Courses in general and professional education- Duration of the course, minimum qualification for admission, intake capacity and authorities to which affiliated one recognised.

#### II. Enrolment ( Table II & III)

Table II A: subjects which can be offered at degree level.

Table II B: subjects which can be offered at post-graduate level.

Table II C: Number of students on rolls for general education according to type and level of education

Table II D: Number of students on rolls in oriental subjects, Diploma and certificate course only.

Appendix to table II (c) subject-wise distribution of students.

Table III: Number of students on rolls for professional education according to type and level of course.

#### III. Statistics of Foreign students (Table IV).

Subject-wise, country-wise and faculty-wise information is collected.

#### IV. Teachers ( Table V)

Table V A Distribution of teachers according to subjects and designation for Art subjects.

Table V B: Above information for science subjects.

Table V C: Above information for professional subjects.

#### V. Bio-data of Principal:

It deals with detailed information about the bio-data of the Principal of the college e.g name, date of birth, education qualifications, subjects of specialisation, research work, knowledge of languages, ~~visits~~ abroad and experience of teaching and research.

Form B-4 ( for University Departments and University Colleges )

This form is also like above form with only additional information on University Teaching Departments.

The data collected in the above forms ~~are~~ tabulated and most of that <sup>are</sup> cyclostyled. Only important data <sup>are</sup> published in its annual publications ' University Development in India, Basic Facts and Figures".

References

1. Forms used by Ministry of Education, University Grants Commission and N.C.E.R.T. for collection of data.
2. Manual of Educational Statistics: India, Ministry of Education and Youth Services, New Delhi, 1964.
3. Second All India Educational Survey, N.C.E.R.T. New Delhi 1967.
4. V. Vishwanathan, Statistical Activities of U.G.C., Lecture delivered in C.S.O. of India, New Delhi, Feb. 1970.

CHAPTER XV

PUBLICATIONS

In this chapter various publications containing statistics on education in India have been discussed. The available publications on the subject can be classified into two broad categories viz.,

- a) Regular publications, and
- b) Ad-hoc publications.

The regular publications provide information on a continuous basis and radical changes in their coverage are seldom. They are based on set programme and policy and the statistics for these publications are collected as a matter of routine. The ad-hoc publications provide detailed statistics on a particular item of information and the items of information may change from year to year or from publications to publication. The ad-hoc publications are the results of some ad-hoc study carried out generally to fill a particular gap in information.

A source-wise list of publications has been given below with a brief account of some of them:

I. Ministry of Education and Youth Services:

Following is a list of publications of Ministry of Education and Youth Services with their periodicity and latest year of issue upto March, 1970:

S.NO:	Title of Publication	Periodicity	Year of latest issue.
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Printed Publications

1.	Education in India Vol I	Annual	1964-65
2.	Education in India Vol. II	-do-	1964-65
3.	Education in India Vol. II-A	-do-	1965-66
4.	Hindi Education Vol. I	-do-	1959-60
5.	Education in Universities in India	-do-	1964-65
6.	Directory of Institutions of Higher Education in India	Biannual	1967
7.	Education in India - A Graphic presentation	Quinquennial	1963

Mimeographed publications

1.	Selected Statistics of Education	Annual	1968-69
2.	Provisional Statistics of Education in India	-do-	1965-66
3.	Provisional Statistics of Universities in India	-do-	1965-66
4.	System of School Classes	-do-	1968
5.	Pay-scales of teachers	-do-	1966-67

Other Ad-hoc Publications

- 1. First Education Survey Report - 1957
- 2. Districtwise-Educational Statistics in India- 1960-61
- 3. Education Commission Report - 1964-66
- 4. Education Commission Report (Supplementary Volume) ( only Statistical Tables) - 1964-66
- 5. Expenditure on Education as shown in Annual Budgets of States

6. Separate Volumes for All States/ Union Administrations showing District-wise Educational Development- 1965-66.
7. Educational Statistics at a Glance - 1969.

1. Education in India:

This publication surveys the progress of education in the country annually. It deals with almost all aspects of education and educational institutions. It gives detailed statistics likely to be of interest to planners, educationists, educational administrators and students of education. The publication is mainly factual except the last chapter ( of Vol. I) which gives quinquennial statistical progress and attempts to indicate broad trends of development in selected fields of education. This publication is issued in three parts:

a. Education in India: Vol-I

It contains statistics for Indian Union as well as its States and Union Territories on educational organisations and personnel; primary, secondary and University education; training of teachers; professional, technical and social education; and on miscellaneous items of special education.

b. Education in India -Vol.II

It provides consolidated statistics at All -India level. The information relates to institutions, pupils, teachers, expenditure, examination -results, education in rural areas, distribution of scholars going abroad for further studies etc.

c. Education in India -Vol. II A

It is just a separate appendix to Vol.II containing information on State Education Service, State Directorates and Inspectorates scales of pay of teachers for primary middle and high/ higher secondary schools for all States.

2. Education in States:

This was an annual publication of Ministry of Education giving the salient statistics of educational institutions in the States and Union Territories of India. Its publication has been stopped since .. 1962-63

because it was creating duplication to the information already contained in Education in India Vol-I. However, its mimeographed copy is issued every year containing data on area population, number of institutions, number of pupils on rolls, expenditure on educational institutions, number of teachers and examination results etc. separately for every State/ Union Administrations.

3. Education in Universities in India:

This is an annual publication and gives information about Universities and their affiliated and constituent colleges. It has two chapters:

Chapter I - gives a brief account of the development of ..

Chapter II gives a statistical account of the varied progress made during the year under review.

The statistics contained in the publication relate to

- i/ the number of Universities in India- their jurisdiction, type, faculties and medium of instruction.
- ii/ University/ college enrolment (classified by teaching departments/ college) by type of education and by standard.
- iii/ Number of foreign students in India;
- iv/ Number of teachers by type of education, salary groups;
- v/ Examination results- standard-wise and faculty-wise;
- vi/ Income and expenditure of universities and their colleges;
- vii/ Statistics of libraries; and
- viii/ Statistics of evening colleges/ courses.

All these statistics are for both the current and preceding years.

### 3. Education in India- A Graphic Presentation;

It is a quinquennial publication depicting salient statistics of education in India through graphs, charts and diagrams. There is no additional information in this publication except what is given in Education in India.

### 4. Directory of Institutions for Higher Education

This is a biennial publication giving information about the courses of study available in universities, institutions of national importance, colleges and other institutions of higher education in India as on a particular date of the year. It also gives information about the type, jurisdiction, departments of student studies, academic terms and the medium of examinations in each university.

### 5. Report of First All- India Education Survey:

To correct uneven distribution of schools and to decide the locations of new ones to be opened in a planned manner, the First Educational Survey was conducted. The scope of the Survey was restricted to identification and delimitation of school areas.

The Survey collected information in respect of rural habitations in different population strata with and without educational facilities at primary stage according to distance children had to walk. The Survey also collected information about enrolment in schools, number and area of class-rooms and number of teachers.

### 6. Report of the Education Commission 1964-66 Supplementary Vol. II:

This is the supplementary volume to the Report of the Education Commission published in 1970. It deals with

Part I: Educational Statistics in India(1950-51 to 1965-66)

This part gives statistics of educational development in India during the first three Five Year Plans(1951-52 to 1965-66). The bulk of data has been taken from 'Form A' Statistics of educational Institutions in States for the year 1950-51, 1955-56 and 1960-61. The data for 1965-66 were estimated in the Secretariat of the Education Commission.

Part II: Statistics on Comparative Education in selected Countries:

It deals with data on comparative education in 15 countries including India. These include six developed countries, viz- Japan, U.K., U.S.A., U.S.S.R. and West Germany, three semi-developed countries viz Brazil, Mexico and Yugoslavia and six developing countries, viz Ghana, Nigeria, Pakistan, U.A.R., Turkey and India. Most of these statistics were collected by a Research Team of the Education Commission which went abroad for this purpose.

Part III: Educational Statistics in Selected Districts in India 1965-66.

This part deals with educational statistics, specially collected for the Commission, of 29 selected districts in 9 States. The data were collected in Form A.2 of the Ministry of Education with slight modifications. This is for the first time that the information of this type has been made available.

Part IV: Total Educational Expenditure in India 1950-51 to 1965-66

This part deals with educational expenditure in India. It is divided into two sections: Section I gives statistics of educational expenditure for the country as a whole, arranged according to objects and sources from 1950-51 to 1965-66. Section II gives similar data State-wise for two years 1956-57 and 1961-62.

Part V: Educational Opportunities in India 1960-61.

This part deals with the development of education in different States and districts of the country. It is divided into two sections:

- a/ In section I, the State differences have been analysed by giving both qualitative and quantitative achievements.
- b/ Section II deals with districts. The differences between districts have been studied only in two fields- demography and education.

Part IV and V have been based on the data collected by the N.C.E.R.T. for its research Project, "A study of Costs of Education in India."

II. University Grants Commission :

It has only one important annual publication 'University Development in India- Basic facts and figures'. It provides a convenient summary of important statistical information about the Indian Universities. The first report was published in 1962. The report gives a consolidated picture of the development in the Universities and higher education at the All- India level and also for individual universities. The Statistics are, however, not provided for individual States or Union Territories. At first/this report is mimeographed with very detailed information and only its important portions are published afterwards. Its latest issue is for 1966-67 while in cyclostyle form, its 1968-69 issue is also available. Following are its contents: ( All India Statistics)

- i/ Universities
- ii/ Colleges and Teaching Departments
- iii/ University Enrolment
- iv/ Enrolment in Faculties
- v/ Enrolment according to stage
- vi/ Staff
- vii/ Halls of residence & Staff quarters
- viii/ Post-graduate Education
- ix/ Institutions treated as universities
- x/ Institutions of National importance.

III. National Council of Educational Research and Training:

N.C.E.R.T. has no regular publication on educational Statistics. Only following are its important publications directly containing educational statistics either collected or secondary statistics collected from other sources.

1. Second All India Education Survey:

This Survey was conducted in 1965 to bring the date which was collected in 1957 under First All India Education Survey organised by Ministry of Education.

The actual work for the Survey was started in August, 1965. The information since then collected is contained in the publication 'Second All-India Educational Survey' brought out by N.C.E.R.T in 1967. It presents a comprehensive study of education at primary, middle and secondary stages of education with special reference to school facilities, size of school, enrolment and teachers as on 31st of December in 1965. The data has been collected for (i) every district habitation (ii) every primary, middle and secondary school, (iii) habitations which have in them provisions of educational facilities at primary middle and secondary stages and (iv) habitations without educational facilities in them at primary, middle and secondary stages.

Information has been collected on following topics:

- i) In case of every habitation under (iv) above, the distances at which educational facilities at the various stages are available for habitation in different population slabs.
- ii) The distribution of primary, middle and secondary sections and enrolment in these section according to number of teachers and grades in section.
- iii) The distribution of primary, middle and secondary sections according to number of teachers and enrolment in each section.
- iv) Classwise enrolment in schools with different sections.
- v) The distances which children at primary/ middle/ secondary stages walk from their school-less habitations to the schools in the neighbouring habitations.

- vi/ Distribution of teachers in primary, middle and secondary sections according to their qualifications.
- vii) Enrolment in different grades at primary, middle and secondary stages.
- viii) The distribution of untrained teachers according to their age and teaching experience.
- ix) Distribution of schools according to their management and the nature of ownership of school buildings and area and number of classrooms.
- x) The qualification of teachers teaching science in secondary schools and laboratory facilities available for them for teaching science.

The main purpose of the collection of the above data for the Survey was to prepare educational development plans for each district of India.

## 2. Indian year Books of Education:

N.C.E.R.T. brings out year books on various aspects of education in India to focus the attention of the educationists on the current problems and future tasks in every sector of education. Each volume in the series is devoted to some important aspect of Indian Education and aims at providing an objective appraisal of the ~~xxxxxxxxxx~~ <sup>x</sup> problems so that our educational programmes are developed on right lines in future.

So far the Council has brought out three Year Books. First two year books contain a good deal of educational statistics while the third one is descriptive and does not have statistics.

### First Year Book of Education:

It is devoted to a review of education in India from 1947 to 1961 covering educational development at the centre and in the States. It has been divided in two parts:

Part I : National Review and Central Programmes

Part II: State Programmes.

The major portion of both the parts is descriptive and detailed statistical tables are given in the appendix. These tables relate to institutions, enrolment, number of passed in selected examinations, teachers and educational expenditure. The facts and figures have been taken from the Ministry of Education and erstwhile Ministry of SR & CA.

### Second Year Book of Education:

It concentrates on the problems of elementary education in India. In its analysis of situation as it



indicates the lines on which work in this sphere should be planned and the manner in which it should be carried out. It contains about 56 statistical tables depicting various aspects of primary education e.g. institutions, enrolment, teachers, remuneration of teachers, total direct expenditure and progress of girls education.

### 3. Different Surveys conducted by Survey Unit of N.C.E.R.T:

Following surveys have been conducted in the field of school education by the Survey Unit upto this time and are available only in cyclostyled form:

- a) Survey of High/Higher Secondary/ Multipurpose Schools offering Technical (Engineering) Stream/ Group/ Subject under elective/ Optional/ Diversified course-1968: It is a detailed survey of schools offering technical (Engineering) as subject-elective, optional etc.
- b) Survey of Institutions for Physically Handicapped in India- Deaf, Mute & Dumb- 1968:  
It gives the programmes, types of instructions, both academic and vocational, the quality of teachers imparting education etc.
- c) Survey of Institutions for Physically Handicapped in India for Blinds -1968.
- d) Colleges and Institutions of Physical Education- A Survey- 1967
- e) Survey of High/Higher Secondary/ Multipurpose schools offering Agricultural Stream/ Group/ subject under Elective/ Optional/ Diversified Course- 1968: It is a detailed survey of schools offering agriculture as a stream-elective, optional etc.
- f) Junior Technical Schools- A Survey- 1967
- g) Intensive Study of Blocks- 1968: It is a detailed study as a supplement to All India Education Survey, in the field of education only in respect of following few Blocks.
  - i/ Sadar Block ( H.P.)
  - ii/ Shahpura Block ( Rajasthan)
  - iii/ Bihta Block ( Bihar)
  - iv/ Badnagar Block ( M.P.)

### 4. Surveys conducted by other Units of N.C.E.R.T.

- a) National Survey of Elementary Teacher Education in India Published in 1970.
- b) Second National Survey of Secondary Teacher Education in India published in 1969.
- c) Status of Elementary school Teachers- (A pilot Study)- 1965-1966.
- d) Directory of Post-graduate teacher Education and Courses -1966.
- e) Survey of Wastage and Stagnation in Primary and Middle Schools in India- 1969.

### IV. Planning Commission:

The Education Division of Planning Commission does not collect any statistics directly from the field but

are its important publications:

- a) Selected Educational and Related Statistics at a Glance (Plan and Non-Plan) 1969.

Educational and related statistics (both time-series and cross sectional) and the other significant and related data have been brought together in this handy volume at one place and in a compact form to facilitate the work of educational planner. It has been planned to re-visit this data from time to time.

Contents:

Section I: General Growth of National Income, population, expenditure on Education- 1950-51 to 1967-68.

Section II: Demographic

Total population, single year-age population- 1951-61. Population projections -Centre, State 1961-81.

Section III: Budgeted Expenditure on Education and Union Territories.

Section IV: Institutions and enrolment

Section V: Teachers

Section VI: Educational expenditure

Section VII: Education in Rural areas

Section VIII: Plan Statistics.

2. Fourth Five Year Plan -1969-74:

Only chapter NO: 16 (Page 352 to 379) of this book on Plan deals with Education & Manpower with following contents:

- i/ Imbalance at Elementary Stage
- ii/ Teacher Education
- iii/ Correspondence Courses
- iv/ Adult literacy
- v/ Cheap Text Books
- vi/ Youth Services
- vii/ Employment
- viii/ Manpower
- ix/ Medical personnel
- x/ Agricultural and Vetrernity Graduats
- xi/ Engineering personnel

3. Other publications:

- a) Educational Development in Fourth Plan (1969-74)- Report of the Planning Group on Education (cyclostyled).- 1968.
- b) Factual Survey of Junior Technical Schools-1964

V. Institute of Applied Manpower Research :

1. Fact Book on Manpower :

The Institute of Applied Manpower Research has attempted to bring to gether in this publication all the available information on various aspects of manpower.

The Fact book on Manpower is in three parts:

Part I deals with population, labour force and employment;

Part II covers education and training

Part III: has assembled data on scientific and technical manpower.

The information has been collected directly

contents have been divided into five sections:

- a) Literacy;
- b) Primary and secondary education;
- c) Vocational, technical, and other school education,
- d) Teachers and teachers' training; and
- e) University education.

The statistics relate to institutions intake enrolment and out-turn and cover the post Independence period.

## 2. Other Publications:

Following publications of I.A.M.R. also contain educational statistics:

- i/ Teachers in Engineering Educational Institutions Working paper NO: 8/ 1964
- ii/ Review of Engineering Educational Institutions in India, Working paper NO: 9/1964.
- iii/ Manpower Aspects of Educational Development- National Educational System- Review of Growth, Working paper NO: 8/1965.
- iv/ Social -Cultural Demand for Elementary and Secondary Education - Trend Based- projections ( by States and sex and analysis of cost) ( cyclostyled).
- v/ Student Wastage in Engineering Educational Institutions, Working paper NO: 13/1965.
- vi/ Development of Modern Medical Education in India, Working paper NO: 4/ 1966.
- vii/ Student Wastage and Stagnation in Medical Colleges, working paper NO: 7/1966
- viii/ Development of Nursing Education in India, Report NO: 4/ 1966.

## VI. Asian Institute of Educational Planning and Administration

This Institute was started in 1962 by U.N.E.S.C.O in New Delhi as a Regional Centre for the training of educational planners, administrators and supervisors in Asia. It has issued following occasional papers mostly dealing with qualitative aspects of educational Statistics.

- i/ Preparation of an Educational Plan for an Asian Country -Practical exercise- 1964
- ii/ Statistics for Educational Planners (Demographic statistics) by G.P.Khara- 1965.
- iii/ Wastage and Stagnation in School Education A pilot study ( 1965).
- iv/ Statistics for Educational planners (Manpower statistic)-1965.
- v/ Elaboration of Five Year Educational Plan-1966.
- vi/ Statistics for Educational Planners (Educational Statistics)- 1967
- vii/ Cost- and Financing in India by C.D. Padmanabhan - 1967.
- viii/ Statistics for Educational Planners (Statistical techniques) 1968.

type of their management ( Government, aided or private), average number of students and teachers per institution and average number of students per teacher by type of educational institutions.

c) Third category:

Only Report NO: 53 on internal migration provides percentage distribution of immigrants in labour force by general educational levels.

d) Fourth Category:

Report NO: 116/1 provides tables with notes on family planning. Three tables of this Report contain cross-tabulation of number of children born alive by ages of wives and husbands and the educational standards of wives and husbands.

IX. Directorate General of Employment and Training:

It has only following two publications which are irregularly brought up-to-date:

i/ A Handbook on Training Facilities:

Its latest issue is for 1966 which deals with institutional training. Such books are also ~~basis~~ published separately by individual States.

ii/ A Hand book on Training Facilities:

It deals with 'inplant training' with latest issue for 1966 and it is proposed to print it even at regional basis

Both the volumes deal with following topics:

- a) Particulars of institution/ undertaking
- b) Courses taught
- c) Duration of the course.
- d) Minimum admission requirements
- e) Method of admission
- f) Stipends/ Tuition Fees
- g) Intake- Capacity.
- h) Hostel facilities etc.

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References

1. I.M.M.R. A Guide to Educational and Training Statistics (draft) Working Paper No. 6, New Delhi, 1967.
2. Ministry of Education and Youth Services, Education in India, Vol. 1, (Annual Publication) New Delhi,
3. Ibido, Education in India, Vol. 2nd and Vol. IInd(a) (annual publication).
4. Ibido, Education in States (annual publication) Stopped after 1962-63.
5. Ibido, Universities in India (annual Publication).
6. Ibido, Graphic Representation of Educational Statistics 1956 and 1966.
7. N.C.E.R.T. 2nd All India Educational Survey, New Delhi, 1967.
8. Planning Commission, Selected Educational and Related Statistics at a Glance, (Plan and non-plan) 1969.
9. V. Vishwanath, Statistical Activities of U.G.C. Lecture delivered in C.S.O. of India, New Delhi, Feb. 1970.

CHAPTER XVI

MAJOR GAPS AND SUGGESTIONS

Inspite

When compared with other developing countries of the world, India has a very good series of statistics on all aspects of educational sector. of all this, there still remain number of gaps in our educational statistics which can be broadly discussed under following heads alongwith suggestions thereof:

1. Aimless duplication:

Specially in case of higher education, as already mentioned, data is collected both by Ministry of Education and University Grants Commission. It is difficult to see the advantage of these two bodies duplicating each others work. What I feel- it is an extra work for the administrators of the Universities and Colleges where the entries must be filled in. A possible advantage could be mutual check on the data, but as they are gathered on different moments during the academic year, this possibility is ruled out. This time difference ( the Ministry of Education takes its data as per 31st March of each year and the University Grants Commission as per 15th August.) could have offered a great advantage because it would indicate the difference in enrolment at the start and at the end of the academic year. However, this advantage is lost because frequently it turns out that there are more students at the end of the year than at the beginning-whereas we could logically expect drop out reducing the initial number. So, it is necessary to avoid, as far as possible, the duplication of work between these two organisations.

Even in the case of statistics of school-level education, the Second All India Educational Survey by the National Council of Educational Research and Training has given an additional set of figures for the year 1965-66. The reference date for this Survey was also 31st of December, 1965 i.e. three months earlier to Ministry's date of reference but the data of enrolment was much lower instead to be higher. The prima-facie basic cause is wrong reporting by the primary reporters who have been separately approached by both the agencies. It is true that the utility of the Survey cannot be under estimated, but the procedural approach for its organisation should be given a new thought. Proforma and other technical aspects of the next proposed Survey should be devised by the N.C.E.R.T. which should also undertake the task of interpretation but the collection

## 2. Improvement in the methods of data -collection:

i/ So far as the collection of statistics is concerned, we are following the method of annual questionnaire to be filled in by educational institutions. This is the main method followed by developed countries and will remain so in many more years to come. However, some of the improved alternative methods have been suggested in the section I of this study. It may not be practicable to switch over to these methods for general collection of statistics but could be tried in selected areas e.g. Individual Data System may be very useful particularly for the statistics of teachers.

ii/ Moreover, in all the areas of collection, we must not have a census survey but steps should be taken to follow the method of sample survey- specially while collecting data on age- distribution of enrolment and teachers, stagnation and, if possible, stage- wise and salary-wise distribution of teachers. Certain States do follow the sampling approach but other States should also follow the same for an improvement in the quality of data. For this purpose, some standardized methodology should be suggested by the Ministry to prepare Master Sample Frames of Institutions both for Centre and States. This point has also been stressed in the 3rd National Seminar on Educational Statistics.

iii/ Keeping in view the Indian condition, one can remark that the efficiency will improve if the work is centralised at the State level. The collection and consolidation of statistics for primary and middle schools should be done at the Tehsil, Block, etc. levels and State level. The implementation of this suggestion will definitely require strengthening of statistical units at the State level.

## 3. Time-lag in collection and publication of data:

Another drawback is the unusual delay which occurs in the collection and publication of educational statistics. The time lag for different publications ranges between any thing from three to four years. This unduly long delay reduces the utility of the data and sometimes urgent decisions have to be either postponed because of non-availability of statistics or are taken in darkness. I feel that if suggestions given in point (2) above are followed, we can easily remove time- lag involved in the collection aspect of the data.

In case of publication, clearly a lot of scarce print is wasted. It would be very suitable that two types of publications are brought out; with all the data needed by the general public and the other should be a cyclostyled one that goes into the details and can be utilised mainly by specialists and research workers. This way, the time-lag in publication can be removed to the greatest extent.

#### 4. Improvement in the quality of data:

While making use of the present available data, one may come across even such set of figures which have dubious character. The basic cause for such a primary reporting by the reporters and their improvement will definitely raise the quality of the data. Four suggestions may be offered in this case:

- a) The subject of 'official Educational Statistics', should be introduced in the curriculum of teachers' training institutions which will have a long term effect on the quality of the data.
- b) Regular inservice training courses of short duration should be made a permanent feature in all the State Education Departments. It will have an immediate effect.
- c) In order to be absolutely sure of the completeness in the coverage of institutions, a sample check of the response, particularly in the case of primary schools of certain areas, should be taken up annually. This point has also been stressed in the Fourth Seminar on Educational Statistics.
- d) It is very essential that either the books of accounts maintained by the Institutions in such a manner as to incorporate the needs of statistical questionnaires or new books to keep regular record of statistics are introduced. Any of these methods can be followed according to suitability after practising both. Moreover, like 'compulsory accounts-audit' we should try to motivate the idea of 'Statistical-audit' which may be done by departmental inspecting authorities where the fraudulent practices in data-reporting should be severely dealt with.

#### 5. Simplification of the Forms used for data collection:

The emphasis must be given on the collection of such statistical material that is simple and good rather than more complicated which may run the considerable risk of being poor in quality. Steps, therefore, may be taken to simplify the questionnaire so that it is easily understood by all concerned. But this simplification must not be at the cost of the required adequacy of coverage. What one happens to find that the data-collection merely goes on at its own momentum and sometimes even without any reference to changing needs

data nobody ever uses could be dropped and data enabling a greater insight in the process of education could be elaborated.

It must be pointed out here that the concept of direct and indirect expenditure, though clearly defined in the manual, is too difficult to be understood by most of the persons who are our primary reporters. The expenditure from different sources further complicates the problem, resulting in supply of wrong statistics and avoidable delay. It may be suggested here that simple details of income and expenditure as required in Form B-I should also be collected from schools and the required shape can be given by the persons at District or State headquarters who are already trained or can be easily trained.

Another point which may be mentioned here is about indirect expenditure on buildings, equipments etc. on institution in rural areas. For the State on a whole this information is being collected for broad categories of institutions (for buildings) and total only for equipment and other items where as for institutions in rural areas this information is sought by each-type of institution. Practically, States find it difficult to give the details even for the broad categories of institutions as the construction work is done by the P.W.D. and the detailed account is not maintained. Details for rural and urban institutions and that too institution wise such as primary basic and non-basic separately, middle basic and non-basic separately, result in delay in the submission of filled in returns. Since the total figures for the State (detailed information institution-wise) are not available, the details in respect of institutions in rural areas do not serve much purpose.

#### 6. Standardisation of concepts and definitions:

No doubt that the publication of the first 'Manual of Educational Statistics' in 1964 by the Ministry of Education was a great landmark in the standardization of concepts and definitions in India, but these are mostly confined to the use of Ministry only. For example commerce colleges are taken to be institutions for professional education by the Ministry while University Grants Commission consider them as institutions for general education. Such things make the data incomparable. So, steps must be taken to remove such gaps by the agencies like C.S.O. of India by introducing



strictly followed by all.

7. Special Studies and projections:

There is very little work done by way a special studies, projections etc. In fact hardly any-thing is attempted beyond the collection of routine annual data. There is an urgent need, therefore, to evolve a suitable programme of special studies, projections, etc.

I Topics for periodical studies.

The topics for periodical studies may be divided into three parts:

- Studies based on data already collected and available with the principal agency i.e. Ministry of Education but not fully tabulated and analysed, and
- Studies for which data are to be collected from the field.
- Case studies i.e. research projects.

A. Studies based on data already available with the Ministry

Detailed tabulation and analysis of all data collected in Form A-2 (on selected topics) from 1964-65 onwards to bring out:

- i/ the variations in pupil teacher ratios in primary, middle and high/ higher secondary sections
- ii/ stagnation rates in classes I-VIII in the different States and at the all-India level,
- iii/ age-distribution of teachers in primary, middle and high/ higher secondary sections to calculate retirement rates etc. and
- iv/ distribution of teachers in primary, middle and high/ higher secondary sections by emoluments, to bring out the variations among the States and also among the institutions under different managements.

b) Detailed tabulation and analysis of data for 1960-61 and 1965-66 to bring out rural/ urban differential in educational facilities created, their utilisation and the rate at which the differential is narrowing for different types of education .

c) Detailed tabulation and analysis of data for 1960-61 and 1965-66 to bring out the contribution of different sources in the financing of education of different types and the variations among the States and also between urban and rural areas to arrive at student cost of education by type of institution and its variation. This study should be continuation of the studies in the cost of education conducted by N.C.E.R.T. for the period 1950-51 to 1960-61.

d) Detailed analysis of data on scholarships, stipends and financial assistances to arrive at the extent of benefits derived by the students in different institutions both in the case of number as well as amount.

e) Analysis of Form B-1 - statistics of colleges in India- to bring out variations in the cost of education of different types in the colleges in the different States and Universities and other characteristics.

- f/ Analysis of data on the progress of girls and women education
- g/ Analysis of data on education of scheduled castes and tribes.

B. Field Studies:

- a/ Survey of unrecognised schools
- b/ Diagnostic sample studies of wastage and stagnation.
- c/ Survey of facilities in schools
- d/ Survey of condition of school buildings
- e/ Survey of ~~the~~ problem of absenteeism in schools.
- f/ Survey of school health statistics
- g/ Survey to collect data on socio-economic background of the children.

C. Case Studies:

- a/ Functional/ Adult literacy experiments
- b/ Institutional Planning in States
- c/ Methods of financing education: a comparison.
- d/ How much should States spend on education ?
- e/ Financing the expansion of compulsory education.
- f/ The economic aspects of pilot literacy programmes
- g/ The education of women and their place in teaching profession
- h/ The village school teacher and rural development etc. etc.

II. Projections

This is very important aspect of educational planning but it has not been touched so far. Ministry of education or some other educational research institution like N.C.E.R.T. or Asian Institute of Educational Planning and Administration should undertake the job of standardising various methods and models according to Indian situation for projection of various aspects of education

i.e. enrolment, teachers, institutions, expenditure etc. Projection methodology given in the present study can also be tried successfully with care.

8. Scope of Coverage

Even while the scope of the statistics collected on educational aspects is quite wide, there is always a need for more and more varied type of data particularly for planning and evaluation, some of these are.

- i/ Statistics of unutilised capacity of institutions Statewise.
- ii/ Statistics on institutional buildings, their ownership, condition, capacity etc.
- iii/ Enrolment in high and higher secondary schools for elective subjects.
- iv/ The number of students re-enrolled for further and higher education and, of this number how many belong to the current academic year and how many to older cohorts.
- v/ Separate figures of fresh entrants, repeaters, and students dropping out.
- vi/ Children benefitted by mid-day meals, free textbooks, free uniforms and other assistances.
- vii/ Distribution of teachers by subjects taught and their qualifications.
- viii/ Classification of teachers by length of experience in teaching occupation and suitable salary groups.
- ix/ Percentage of schools working <sup>for</sup> more than one shift.
- x/ Student wastage at different levels and reasons thereof.

In addition to the above following are some of the new areas in which data should be collected:

- a/ The minimum qualifications and procedure for selection of teachers in primary, middle, high/higher secondary schools in different categories of management.
- b/ The rates of fees charged in Government, local authority, private aided and unaided schools according to classes.
- c/ Service conditions of teachers as they exist separately for Government, local authority, and private aided institutions.
- d/ The number of new teachers recruited in each academic year according to their qualification, age, social background, etc.
- e/ Studies relating to teachers of different categories on the basis of age, sex, qualifications, social background etc.
- f/ Attrition rates among teachers of different categories and in different areas.
- g/ Special problems of teachers not covered under any of the above.
- h/ Number of new schools started and upgraded in urban and rural areas.
- i/ Rules for grant-in-aid to private aided schools.
- j/ Disruption of normal work in schools - causes and duration, etc.
- k/ Details of examination results.
- l/ Intake and output of various categories of institutions and professional education.

References

1. Institute of Applied Manpower Research, A Guide to Educational and Training Statistics(draft), Working Paper No. 6, New Delhi, 1967.
2. Q. U. Khan, Statistics for Educational Planning, Manpower Journal, Vol. 4, No. 4, I.A.M.R., New Delhi, Oct.-Dec.1968
3. Ministry of Education and Youth Services, Report of Ist Seminar on Educational Statistics, 1962, New Delhi.
4. Ibido, Report of 2nd Seminar on Educational Statistics, 1964.
5. Ibido, Report of 3rd Seminar on Educational Statistics, 1965.
6. Ibido, Report on 4th Seminar on Educational Statistics, 1968.
7. Ibido, Report of Workshop on Educational Statistics, 1969.
8. Ibido, Report of Committee on Re-organisation of Statistical Unit, 1969.
9. Ibido, Report of Education Commission: 1964-66, II Supplementary Volume 1, 1970.
10. J. P. Naik, Teachers: Current Manpower Problem, Lecture delivered in I.A.M.R. New Delhi, Feb.25, 1970.
11. N.C.E.R.T., Cost, Efficiency and Measurement in Education (Ed. H. N. Pandit), New Delhi, 1970.
12. U.N.E.S.C.O., Statistics of Education in Developing Countries, Paris, 1968.

B I B L I O G R A P H Y

1. Adelman, I., A linear programming model of educational planning: a case study of Argentina in I. Adelman and E. Thorbecke (eds.), *The Theory and Design of Economic Development*, Johns Hopkins Press, Baltimore, 1966, pp.385-412.
2. Bagai, S.B., Implication of social demand approach to educational planning: A case study of India in *Manpower Journal*, Vol. III, No.1, I.A.M.R., New Delhi, Jan.-March, 1968.
3. Bodart, N., Problems of Measuring Educational Yield in order to assess Educational Productivity, Discussion paper. I.J.E.P., U.N.E.S.C.O. Paris, 1965.
4. Benson, C.S.(ed). *Perpectives on the Economics of Education: Readings in School Finance and Management*, Houghton Mifflin, Boston, 1963.
5. Burkhead, J., *Public School Finance: Economics & Politics*, Syracuse University Press, Syracuse, New York, 1964.
- ✓ 6. Chesswas, J.L., *Methodologies of Educational Planning for Developing countries (Two Volumes)*, UNESCO, Paris, 1969.
- ✓ 7. Croxton & Cowden, *Applied General Statistics*, 2nd ed. Prentice Hall, New Delhi.
8. Devis, R.G., *Planning Human Resources Development. Educational Models and Schemata*, Rand Mc Nally & Co., New York, 1966.
9. Edding, F., *International Development of Educational Expenditure 1950-65*, UNESCO, 1969.
10. Frank Yats, *Sampling Methods for Census & Surveys*, 3rd ed., Charles Griffin & Co., London.
11. Groves, M.M., ., *Educational and Economic Growth*, U.S. Committee on Educational Finance, National Education Association, Washington, 1967.
12. Griffiths, V.L., *Educational Planning*. Oxford University Press, London, 1962.
13. Harold, F.D., *Pitfalls in population forecasts and projections*, *Journal of the American Statistical Association*, Washington, D.C. Sep. 1950.
14. Institute of Applied Manpower Research (I.A.M.R.) *'A Guide to Educational and Training Statistics (draft)*, Working paper No. 6, New Delhi-1967.
15. I.A.M.R., *Manpower Aspects of Educational Development: Plan of Studies*, Occasional paper No. 3/1964, New Delhi, 1964
16. \_\_\_\_\_, *Manpower Aspects of Educational Development: National Population Growth prospective*, Working Paper No. 7/1965.
- ✓ 17. \_\_\_\_\_, *Manpower Aspects of Educational Development: National Educational System- Review of Growth*. Working Paper No. 8/1965:  
Part I: (Proposed) Standard Classifications of National Educational Curricula.  
Part II: Enrolment  
Part III: Educational Expenditure  
Part IV: Teachers  
Part V: Out-turn
18. \_\_\_\_\_, *Manpower Aspects of Educational Development. Socio-cultural demand for Elementary Education-Trend Based Projections for enrolment in Primary and Middle classes in the year 1976 by States and Sex and an*

19. I.A.M.R., Manpower Aspects of Educational Development: Educated persons in India, 1960-61 and 1975-76. Working paper No. 11/1965:  
Part I: Educated persons in India by Zones 1960-61  
Part II: Educationally classifiable posts in India, 1962-63.  
Part III: Educationally classifiable posts in Organised Industries and Services- Growth perspective (1962-63 to 1975-76).  
Part IV: Perspective demand and supply of educated persons in India (1960-61 to 1975-76 ).  
Part V: Growth of Out-turn of Educational Cohorts: National Higher Education and Regional Education.
20. \_\_\_\_\_, Manpower Aspects of Educational Development: National Economic Development ~~Personnel~~ Planning Assumptions, Working paper No. 12/1965.
21. \_\_\_\_\_, Manpower Aspects of Educational Development: Nature and Dimensions of unemployment among educated persons in India, 1953-1964, Working paper No. 14/1965
22. \_\_\_\_\_, Manpower Aspects of Educational Developments: Socio-Cultural Demand for Secondary Education, Trend Based projections for enrolment in secondary classes (IX-XI) in the years 1971, 1976 and 1981 by States and Sexes and Analysis of Cost. Working paper No. 15/1965.
23. \_\_\_\_\_, Manpower Aspects of Educational Development: (Draft) Educational Perspective Plan Frame (Charts and Diagrams issued separately also) Working paper No. 17/1965.
24. \_\_\_\_\_, Fact book on Manpower (Revised ed) Part I: Report No. 1/1968.
25. \_\_\_\_\_, Fact Book on Manpower - Part II: Education and Training Report No. 4/1969.
26. \_\_\_\_\_, Fact Book on Manpower - Part III: Scientific and Technical Personnel Report no. 5/1969.
27. Indian Institute of Public Opinion, Accelerating Educational Growth and Investment 1970-80 - A condition for Productivity of the Poor. Quarterly Economic Report vo. XVI, No. 2, New Delhi Oct. 1969.
28. Jacoby, E.G. Methods of School Enrolment Projections, UNESCO, Paris, 1964.
29. Juvigny, Pierre, Towards Equality in Education, UNESCO, Paris, 1963
30. Kandel, I.L., Raising the school leaving age. (Studies on Compulsory Education No. 1) UNESCO, Paris, 1951.
31. Kamat, A.R., Mathematical Schemes for describing progress of Education in Course of Education, Sankhya, Series B. 30, Calcutta, 1968.
32. Kamat, A.R., & Deshmuk, A.G., Wastage in College Education (Arts Students) Arthavijnana No. 3, 1960 (a).
33. Kendall and Bunkland, Dictionary of Statistical Terms, 2nd Ed. , Oliver and Boyd's London.
34. Kendall, W.L., Statistics of Education in Developing Countries - Statistical Reports and Studies. UNESCO, Paris, 1968.
35. Khan, Q.U., Statistics for Educational Planning Manpower Journal Vol. IV No. 4, I.A.M.R. New Delhi, Oct-Dec-1968.
36. Laska, J.A., Planning and Educational Development in India. New York. Institute of International Studies, Teachers' College, Columbia University, New York, 1968.
37. Lewis, W.A., Economic Aspects of Quality in Education. Lecture discussion series No. 7, I.I.E.P. UNESCO, Paris, 1966.
38. Liu, B.A., Estimating Future school enrolment in Developing countries A Manual of Methodology, UNESCO, Paris, 1966.
39. Ministry of Education and Youth Services. The Education Quarterly: Special Issue on Wastage and Stagnation in India, New Delhi, Oct. 1968.
40. \_\_\_\_\_

41. \_\_\_\_\_, Education in India, Vol.I,(Annual publication).
42. \_\_\_\_\_, Education in India, Vol. II and Vol. II(A)(annual publication)
43. \_\_\_\_\_, Education in States (annual publication) stopped after 1962-63.
44. \_\_\_\_\_, Universities in India ( annual publication )
45. \_\_\_\_\_, Graphic representation of educational statistics, 1956 & 1966.
46. \_\_\_\_\_, District-wise educational statistics of India, 1960-61.
47. \_\_\_\_\_, District-wise educational statistics separate Volumes for each State 1965-66.  
Directory
48. \_\_\_\_\_, \_\_\_\_\_ of Institutions for Higher Education, 1968-69.
49. \_\_\_\_\_, Educational statistics at a Glance, 1969.
50. \_\_\_\_\_, Expenditure on education as shown in Annual Budgets-1966-67 to 1968-69.
51. \_\_\_\_\_, Pay scales of teachers, 1968-69.
52. \_\_\_\_\_, Report of 1st Seminar on Educational Statistics, 1962.
53. \_\_\_\_\_, Report of 2nd Seminar on Educational Statistics, 1964
54. \_\_\_\_\_, Report on 3rd Seminar on Educational Statistics, 1965
55. \_\_\_\_\_, Report of 4th Seminar on Educational Statistics, 1968
56. \_\_\_\_\_, Report of Workshop on Educational Statistics, 1969
57. \_\_\_\_\_, Report of Committee on Reorganisation of Statistical Unit, 1969
58. \_\_\_\_\_, Report of Education Commission: 1964-66.
59. \_\_\_\_\_, Report of Education Commission: 1964-66, Supplementary Volume II, 1970.
60. Naik, J.P., Teachers: Current Manpower Problems, Lecture delivered in I.A.M.R., New Delhi on Feb. 25, 1970.
61. Naik, J.P., Enrolment policies in Indian Education, Manpower Journal, Vol.I No. 1, I.A.M.R. New Delhi, April, 1965.
- >> 62. National Council of Educational Research and Trainings (NCERT) Second Educational Survey of India, Guidelines for Survey Officers, Education Survey Unit, NCERT, New Delhi, 1964.
63. \_\_\_\_\_, 2nd All India Education Survey, 1967.
64. \_\_\_\_\_, 1st Indian Year Book of Education, 1961
65. \_\_\_\_\_, 2nd Indian Year Book of Education, 1964
66. \_\_\_\_\_, 3rd Indian Year Book of Education, 1968
67. \_\_\_\_\_, Survey of High/Higher Secondary/Multipurpose Schools offering Technical(Engineering) Stream/Group/Subject under Elective/Optional/Diversified Courses- 1968.
68. \_\_\_\_\_, Survey of Institutions for Physically handicapped in India: Deaf, Mute and Dumb - 1968.
69. \_\_\_\_\_, Survey of Institutions for physically handicapped in India, Blind, 1968.
70. \_\_\_\_\_, Colleges and Institutions of Physical Education -A Survey, 1967.
71. \_\_\_\_\_, Survey of High/Higher Secondary Multipurpose schools offering Agriculture Stream/Group/Subject under Elective/Optional/Diversified Course, 1968.
72. \_\_\_\_\_, Junior Technical Schools, A survey, 1967.
73. \_\_\_\_\_, Intensive study of Block i.e. Sadar Block, Shahpurablock, Bihata Block and Badanwar Block - 1968
74. \_\_\_\_\_, A study in Unit Costs at School Stage in India, 1968.
75. \_\_\_\_\_, Directory of post-graduate Teachers Education Institutions & Courses, 1966.

77. \_\_\_\_\_, Second National Survey of Secondary Teacher Education in India, 1969
78. \_\_\_\_\_, Cost, Efficiency and Measurement in Education (ed. H.N. Pandit) - 1970.
- ✓ 79. O. E. C. D., Economic Aspects of Higher Education, Paris, 1964
80. \_\_\_\_\_, Methods and Statistical Needs for Educational Planning - 1967
81. \_\_\_\_\_, Econometric Models of Education - Some Applications (Education and Development: Technical Reports) 1965
82. \_\_\_\_\_, Mathematical Models in Educational Planning, (Education and Development: Technical Reports) 1967
83. Pandit, H.N., Economic Approaches to Investment Decision-making in Education. Indian Educational Review, Vol. 5, No. 1, NCERT, New Delhi, January 1970.
84. Pandit, H.N., National Teaching Manpower for school stage Education, Past Trends, Present position and Future Growth, Indian Education Review, Vol. IV, No. 2, NCERT, New Delhi, July - 1969.
85. Pearce, F.G., Plan for Education, Oxford University Press, Bombay, 1948.
86. Planning Commission, Factual Survey of Junior Technical Schools, New Delhi - 1964.
87. \_\_\_\_\_, Proceedings of Conference of State Education Ministers, Srinagar, 1965
88. \_\_\_\_\_, Report of Working Party on Educational Planning, Administration and Evaluation in Fourth Five Year Plan (1969-74) - 1968.
89. \_\_\_\_\_, Educational Development in Fourth Plan (1969-74) - Report of Planning Group of Education 1968
90. \_\_\_\_\_, Selected Educational and Related statistics at a Glance (Plan and Non-plan) - 1969.
91. Radhakrishnan, P.N., Planning - Statistical Aspects, Lecture delivered in C.S.O. New Delhi, Feb. 1970.
92. Rao, G.N., and Tikkiwal, D.D., An integrated approach to study the wastage in a given course of Education, Sankhya 28, Sseries B, Calcutta, 1966.
93. Sapra, C.L., Wastage and Stagnation, Naya Shikshak, Vol. XII, No. 1, July - Sep. 1969.
94. Saiyidian, K.G., Naik, J.P. and Hussain, S.A., Compulsory Education in India UNESCO, Paris, 1965
95. Simson, George and Kafk, Basic Statistics (Indian Ed) Oxford & I.B.H. Publishing Co. Calcutta, 1965
96. Srivastava, A.B.L., Models for projection of student population and teachers' requirements, lecture delivered in C.S.O. of India, New Delhi March, 1970
97. Stone, R., A Model of Educational System, Minerva, Vol. 3, No. 2, 1965, pp 172-86.
98. Stone, R., Input-output and Demographic Accounting: a tool for educational planning - Minerva, Vol. 4, No. 3 (1966) pp. 365-81.
99. U.N.E.S.C.O. Organisation of Educational Planning in Asia, Special issue of Bulletin of Regional office for Education in India, Vol. III No. 1, Thailand, Sep. 1968.
100. \_\_\_\_\_, Manual of Educational Statistics, Paris, 1961
101. \_\_\_\_\_, Elements of Educational Planning, 1963
102. \_\_\_\_\_, Statistics of Education in Developing Countries - 1968
103. \_\_\_\_\_, An Asian Model of Educational Development - Perspectives for 1965-1980: 1966
104. \_\_\_\_\_, Economic and Social aspects of Education, 1964



105. United Nations, Population Branch, Methods for Population projections by Sex and Age Population Studies No. 25, New York, 1956
106. Vaizey, J and Chesswas, J.D., The Costing of Educational Plans' UNESCO, Paris, 1968.
107. Versluis, J., (Ed) Mathematical Models of Educational Planning, UNESCO and Netherlands Economics Institute, Rotterdam, 1966
108. Vishwanath, V., Statistical Activities of U.G.C. Lecture delivered in C.S.O. of India, New Delhi, Feb. 1970.
109. Yule, G.U., and Kendall, M.G., An Introduction to the Theory of Statistics 14th Ed., Charles Griffin & Co. London.