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EDUCATIONAL POLICY AND PLANNING PROJECT

INDONESIA

Microcomputer Applications for Education Planning and Management: A Modular Training Program

MODULE I Basic Concepts and Computer Applications to Educational Planning and Management

Office of Educational and Cultural Research and Development
Ministry of Education and Culture

December 1986

IEES

Improving the
Efficiency of
Educational
Systems

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Howard University
Institute for International Research
State University of New York at Albany

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PREFACE

The Educational Policy and Planning (EPP) Project is a six-year project conducted jointly by the Indonesian Ministry of Education and Culture (MOEC) and the Education and Human Resource Division of the United States Agency for International Development (USAID). The overall project objective is to improve the quality of education in Indonesia by assisting the MOEC through the Office of Educational and Cultural Research and Development (Balitbang Dikbud) to formulate better policies and long-term plans. Specifically, the project aims to improve policy formulation and long-term planning by improving the timeliness, relevance, and accuracy of data collected, the subsequent analyses of such data, and the ultimate use for policy and decisionmaking.

There are three major components under the EPP Project: (1) to help the MOEC develop an integrated management information system (MIS), (2) to help the MOEC enhance its policy research and analysis capacity, and (3) to support the MOEC institutional development at the national and provincial level through training. Each of the above components is being implemented at the national level and in three pilot provinces. EPP technical advisory staff work closely with counterpart Indonesian staff as part of a collaborative process of developing institutional capacity.

As a part of the third major component (to support institutional development through training) the EPP Project has developed a set of four training modules in computer applications for educational planning and management. These prototype training modules are especially designed to demonstrate the application of computers for performing educational functions of management, control, monitoring, planning, and budgeting at the provincial level. The modules are laid out in a performance-based instructional design in order for the trainee to master computer skills and package program use in performing their educational tasks. The data utilized in the exercises is on four diskettes which can be obtained on request from Balitbang Dikbud. The program diskettes, i.e., DBASE III plus, Lotus 123 release 2, QuickCode II, and Quick Report, can be purchased in the commercial market. A task analysis of the three EPP pilot provincial education offices was conducted prior to and as a basis for the development of the instructional modules. The focus was on the Provincial Planning Unit which includes the subunits of Program Planning, Data Collection, and Monitoring.

The modules were developed by Mr. Yip Hak Kwong, consultant in Educational Statistics and Computer Applications and Dr. Nat J. Colletta, Education Planner and Chief of Party EPP in collaboration with the Center of Information, Office of Educational and Cultural Research and Development (Balitbang Dikbud). The materials were field tested in the process of training teachers at the Graduate Education Facility, Yogyakarta Institute of Teacher Training and Education (IKIP Yogyakarta). Balitbang has recently translated the materials into Indonesian for further field testing in the three pilot provinces. It is expected that after further field testing and revision the prototype modules would be disseminated through the appropriate MOEC unit.

Harsja W. Bachtiar, Head
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(December 1986)

INTRODUCTION TO EPP TRAINING MODULES ON THE DEVELOPMENT & USE OF MIS ON MICROCOMPUTERS

1.0 Purposes

1.1 These training modules on the development and use of the education management information system are primarily designed for planners and administrators at the provincial level, who are responsible for collecting, processing and analyzing statistics for educational planning and management. The main feature of the modules is the use of microcomputers to enhance the speed, flexibility, and versatility in the use of information.

1.2 The purposes of the modules are as follows:

- To introduce to the participants the basic framework of an integrated education management information system which could be used to serve the varied needs of different users;
- To demonstrate how such a system could be set up, making use of microcomputers, and how data could be retrieved for analytical purposes;
- To show how an interactive model(s) for diagnostic, forecasting, planning and budgeting purposes could be developed on microcomputers; and
- To show, as well, how the computer system and the models could easily be modified to cope with unforeseen changes in requirements, with the help of user-friendly software packages abundantly available on the market.

2.0 The Hierarchies of Information

2.1 When viewed in terms of the point at which information is collated and used, there are three main levels of information:

- The school level, at which detailed information about individual pupils, teachers and staff (including their name, age, sex, grade, home address, academic performance, qualification, salaries, etc.), as well as information about the schools (e.g., area, number of rooms, equipment, etc.) have to be kept for the smooth running of the schools concerned;
- The district level, where not all the data kept by schools are required. Only summary statistics such as the number of pupils by age, sex and grade, and the amount of recurrent expenditures are required for individual schools; and
- The national level, where, depending on the extent of decentralization, detailed information on individual schools may not be required. Only summary information is collected at the subdistrict or district level.

2.2 Alternatively, depending on the usage, information could be distinguished between that for:

- planning,
- management control, and
- operation.

2.3 Ideally, information at the school, district, and national level should be integrated and shared in one, or one network, of data base(s). For instance, information stored in schools could be computerized, and only the relevant data would be extracted and passed to the computer system kept at the district level;

and the similar procedure could apply to the flow of information between the district and national level. This could help avoid a lot of duplication of work, and solve the problems of quality of data and the time lag in producing the information. With the use of individualized data bases, more accurate information could be made available about pupil and teacher flow, which is extremely useful in planning school location, and teacher demand and supply. The individualized data base could also reduce considerably the data problems confronting educational researchers, especially those engaged in longitudinal studies.

2.4 Similarly, the same can be said of information for planning, management control and operation. For instance, a simple ledger accounting system, if carefully designed and computerized, could provide a wealth of information useful in monitoring spending, analyzing cost structure and efficiency, as well as for forecasting and planning educational expenditures.

2.5 For the purpose of the present training modules, it is not proposed to cover the entire spectrum of the information system as discussed above, which would be clearly beyond the scope of this training program. Attention will mainly be focused on the following:

- The flow of information from schools to the provincial and central offices via the usual channel of school surveys conducted by the Balitbang; and
- The use of such information for planning and administrative purposes at the central as well as provincial level.

Once the participants have mastered the basic principles and techniques discussed in this training program, they should have relatively little difficulties to applying them to different information environments in their daily work.

3.0 Organization of the Modules

3.1 There will be four modules in this training program, which are as follows:

- Module I: Overview of basic concepts and computer applications in educational planning, management, and research;
- Module II: The development of the Education Management Information System;
- Module III: The use of the Education Management Information System for management control; and
- Module IV: The use of the Education Management Information System for planning.

4.0 The Structure of Instructional/Learning Process

4.1 Much of the emphasis placed in this training program is the use of microcomputers and software packages. Although data base and spreadsheet programs for data files creation and manipulation and modeling have already been designed for the participants, they inevitably have to understand and practice the techniques in the use of microcomputers and software packages. With the availability of many user-friendly software packages and utility programs, computer programming could be kept to a minimum. It is also the aim of this training module to show to the participants that understanding the basic principles and operating system of the various software packages would be sufficient to enable them make full use of the information available to them for planning, management and research. For those participants who have a keen interest in computer programming and in mastering the software package, this training module will prepare them for further improving their computer skills by practicing the techniques demonstrated in this program.

4.2 It is recognized that the design of a management information system should be largely user oriented. It should start by looking at the potential uses of information rather than for the collection of information per se. However, it would be deceptive to assume that all potential uses of information could be foreseen at the time a management information system is constructed. Furthermore, the requirements and practices in educational planning and management in Indonesia vary considerably from province to province. Thus, it is almost impracticable to include the specific requirements of each and every province in designing the training modules.

4.3 Naturally, participants to the training program would come from different divisions of the provincial education offices. Some of them may mainly be concerned with say planning and budgeting, while others in the supervision of schools or other management functions. Some may be involved only in data collection. Consequently, not all parts of the training program would be of equal interest to the participants.

4.4 Taking into account the above considerations, the approach adopted in the design of the training materials is as follows:

- APPLICABILITY is emphasized in the training program. Wherever possible, practical sessions on microcomputer applications are included in the modules so that the participants can have "hands-on" experience in the course. They will also be invited to try to include some of their daily planning, management and research tasks into the practical sessions, making use of some of the techniques and methods discussed in the training program;
- FLEXIBILITY will be introduced in the design of the training materials so that alternate designs and applications of the management information system will be tested during the practical sessions, making full use of the versatility and flexibility of a computerized data base and the computer software packages; and
- a MODULAR approach will be adopted in the course so that each module is as self-contained as possible.

4.5 The structure of the instructional and learning activities for each of the four modules will thus be arranged as follows:

- Overall Objectives of each of the modules will first be stated so that instructors are aware of the while purpose of the module as well as the knowledge which is expected to be imparted during the instructional and learning processes;
- Module Performance Objectives will also be stated to enable the instructors to assess the extent to which the behavior of learners would be changed upon completion of the module. More specific performance objectives will also be given for different instructional units within a module;
- The actual instructional and learning processes are divided into four phases as follows:
 - Instructional activities where the instructors will present to the learners the teaching materials for the module and unit concerned. The teaching materials will cover the basic conceptual issues related to the topic in question, and fundamentals of computer applications that will be demonstrated, highlighting strengths and weaknesses of such applications;
 - User manual where the instructors will carry on with the presentation, but using microcomputers to demonstrate the various applications in planning, management, and research. The detailed step-by-step procedures required to be followed in developing and using the different computer applications will be described in this user manual section. Therefore, this section is designed for both the instructors and the learners;

- **Learning activities** where the interaction between the instructors and learners will take place. The learners will be asked to:
 - practice the techniques in developing and using the data bases or models demonstrated by the instructors;
 - then the participants will be divided into groups to discuss the concepts, approaches and methods used in the training materials. During the group discussion, they will be asked to suggest alternative approaches to the development and use of the management information system;
 - based on the alternative designs suggested, the learners will, under the guidance of the instructors, actually develop a new management information system and different models of computer applications;
- **Post-assessment** where the instructors will attempt to evaluate the extent to which the learners have been able to have a firm grasp of the contents of the training materials. A number of questions and assessments have been proposed in the unit, and individual learners will be asked to do the assignments themselves.

5.0 **Choice of Computer Software Packages**

5.1 With the rapid development in computer technology, it is difficult to choose software packages which are both the most up-to-date and are familiar to both instructors and learners. Therefore, the factors used in choosing a computer software are the power of the software, the ease of use and its popularity.

5.2 Two types of computing functions are required for these training modules:

- data base management; and
- spreadsheet applications.

A number of software packages have been very successful in integrating data base management with spreadsheet applications, and some statistical functions. However, these packages have limitations which dictate against using them in the training program. Nearly all of these packages are memory (or RAM) based, thus severely limiting the size of the data base that could be handled by the package. The availability of RAM banks or boards can increase the memory capacity of a 16-bit computer like an IBM PC/XT or its compatible to something like 8 mega-bytes. However, these are not yet very popularly used. Furthermore, most of these integrated softwares are not designed to handle relational data bases, a feature which is required in developing the management information system proposed in this training program. As a result, two separate software packages have been used in this training program, with each performing one of the two functions mentioned above.

5.3 A large number of data base and spreadsheet packages are available. The choice of one set of packages does not imply that the others available in the market are not suitable. The following packages are chosen for reasons given below:

- DBASE III (version 1.1 or 2) has been chosen for data base management. There are other data base packages which are as powerful as DBASE III, like RBASE 5000 and KNOWLEDGE 2. DBASE III is chosen mainly because it is more user-friendly with its assistant facilities. Other equally if not more powerful softwares like REVELATION and INFORMIX could be adopted in the training program. But it appears DBASE III is more popularly used in IBM PCs or the compatibles. In any case, the adoption of DBASE III in this training program does not preclude the participants from adapting the methodology and approach used in the training program to other data base management software, including newcomers like PARADOX (version 1.1); and

LOTUS 123 (version 2) has been chosen as the spreadsheet software package largely because of its popularity and its extremely user-friendly approach. Other softwares like VP- PLANNER which is claimed to have almost the same capabilities as Lotus 123, to other software like MULTIPLAN (version 2) which has the additional facility of linking different spreadsheets, could well be adopted, following the approach and methods used in the training program.

5.4 Summing up from the above, the structure of this training program could be visualized as follows:

<u>Module</u>	<u>Contents</u>	<u>Software</u>
I	Basic concepts and computer applications Unit 1: Issues & problems in educational planning, management and research Unit 2: Microcomputer applications Unit 3: Data requirements identification and assessment	WORDSTAR
II	Development of the Education Management Information System Unit 1: Data base construction Unit 2: Information retrieval	DBASE III QUICKCODE III
III	The Use of the Education Management Information System for Management Control Unit 1: Routine administration of schools and projects Unit 2: Monitoring performance of education system	DBASE III QUICKREPORT
IV	The Use of the Education Management Information System for Planning Unit 1: Diagnostic analysis of pupil flow Unit 2: Forecasting enrollment in school Unit 3: Forecasting teacher and other resource requirements	LOTUS 123

It may be noted above that the use of WORDSTAR (version 3.3 or 2000) will be demonstrated when Module 1 is presented to the participants so that they may after the training program be able to use wordprocessing software for report writing.

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Module I

Introduction to Basic Concepts and Computer Applications to Educational Planning and Management

I. Introduction

1. General Module Objectives

1.1 The purpose of this module is to present to the participants the basic concepts and an introductory discussion on:

- (a) Some of the issues and problems in educational planning and management, in as far as the availability and uses of information are concerned;
- (b) The potentials in the application of microcomputers in educational planning and management;
- (c) The considerations in selecting data items for inclusion into an educational management information system, based on an assessment of the requirements of different users.

1.2 Module Performance Objectives. On completion of this module, the participants are expected to be able to:

- (a) Explain the basic issues and problems confronting planners and administrators on the use of information for planning and management;
- (b) List the potential applications of microcomputers in educational planning and management;
- (c) Make an assessment of the data requirements for planning and management, which could be used as the basis for designing an education management information system.

2. The Organization of the Module

2.1 The module is organized into three units as follows:

- (a) Unit 1 gives an introductory discussion on the problems and issues confronting educational planners and administrators, especially in regard to the availability and use of information;
- (b) Unit 2 introduces some of the potential applications of microcomputers in educational planning and management;

- (c) Unit 3 is on user-need identification and the assessment process in the design of an education management information system, where the various potential uses and applications of the management information system will be identified. This will lead to a discussion on the resulting data requirements for the information system.

2.2 It is hoped that this module could serve to present to participants an overview of what will be discussed in much greater detail in the subsequent modules. The discussion on the assessment of data need will also prepare participants for Module II on the construction of the information system, and Modules III-IV on the applications of the information system in planning and management respectively. This will enable participants to appreciate the close interrelationship between data collection and the use of data collected. Furthermore, it is also hoped to underscore in this module the flexibility and versatility that one could have in constructing a computerized data base and in the manipulation of the data, making use of software packages like DBASE III, QUICKCODE III and LOTUS 123.

II. Unit 1: Issues and Problems in Educational Planning and Management

3. Performance Objectives

3.1 On completion of this unit, the participants should be able to:

- (a) Understand the difficulties of educational planners and administrators in understanding and responding to problems and malfunctions in the education system;
- (b) Appreciate the importance of having accurate, complete and timely information for educational planning and management.

4. Instructional Activities

4.1 The main purpose of this unit is to introduce to participants the basic concepts and key issues and problems confronting educational planners and administrators. It is not difficult to draw up a list of problems and issues. However, it would be hard to make up an exhaustive list. Given the diversity and complexity of the subject matter, it is clearly beyond the scope of this module. Therefore, the objective is to, by going through some of the issues and problems in educational planning and management, highlight the need of planners and administrators to understand

quickly changing circumstances and requirements in the education system, and to devise remedial measures accordingly.

4.2 The Process of Planning and Management

4.2.1 The processes of educational planning and management are very much interrelated. This is a point well understood by nearly all planners and administrators. Planning proposes the targets and programs for policy-making. These targets and programs are drawn up on the basis of feedback from experience in management and from research findings, supplemented by the diagnostic analysis undertaken by the planners themselves. Management places its concern on seeing that programs are implemented as planned, and that targets set could be met within the time horizon planned and the resources allocated. Management also has the function of keeping the education system under control. It is an ongoing process of planning, policy-making, implementation, management, and evaluation, with results of one stage leading to another. What has to be added to this process is research. Discussion on the role research activities are beyond the scope of this training programme and are therefore not included in this module.

4.2.2 In real life, the description presented above represents an ideal which is difficult to achieve. Plans are drawn up and implemented long before proper evaluation takes place. Furthermore, circumstances change long before any education plan is approved and implemented. This is partly due to the long planning, budgetary and legislative procedure, and partly due to the fact that variables affecting education such as employment opportunities, available financial resources and student demand are changing rapidly. Thus, the process of formulating plans based on experience from implementation and the management process is often unrealistic at all.

4.3 The Information Gap. One of the crucial difficulties in planning, management and research is what may be called the "information" gap. The "gap" may include:

- (a) The ignorance of educational planners and researchers about the so-called "black box" process in education. Planners and educators are far from being able to understand what is happening in the classrooms which makes children of different backgrounds, aptitude, and abilities to become educated as a citizen, employable as a worker and satisfied as a consumer of the education services;
- (b) The uncertainty about the future as regards the behavior of the pupils, parents and employers;

- (c) The delay in getting, if any, and the lack of perfect knowledge about what is happening within the educational system, and outside the school system. For example, there is a gap between what is planned in the central education ministry and what is being implemented at the regional or school level. The delay in obtaining information which may not be accurate at all about the relationship between the education sector and the labour market would place educational planners and administrators in a bad position to devise remedial measures.

4.4 The Challenge of Planners and Administrators

4.4.1 The challenge posed to planners and administrators is the need to respond quickly to changing circumstances. This means that planners and administrators have to be able to:

- (a) Understand the problems based on accurate and timely information;
- (b) Assess quickly the implications of any changes in the education plans, the alternative solutions which are open and the implications of the alternative solutions.

4.4.2 The need for timely, complete and accurate information is especially for education systems where multiple actors are involved in taking policy, program, budgetary, and practical (implementation) decisions. In many countries, planners, and policymakers are only responsible for setting the targets, formulating the overall educational programmes and allocating the budget. The actual implementation of the programmes could be in the hands of administrators at the regional levels, school heads or administrators of educational institutions. It is therefore essential to see that programmes are implemented and planners and the actual experience of implementation could be fed back to the central planners and policymakers.

5. Learning Activities

5.1 This unit mainly serves as an introductory discussion leading to Units 2 and 3, as well as the other Modules in this training programme. Therefore, the participants are expected to join in the discussion, giving real life experience they have encountered on the various issues and problems discussed in this Unit. In particular, the participants are requested to:

- (a) List incidents where educational plans have to be formulated or even implemented before research results are available. Then the participants will examine what would be the

consequences if the research results turn out not to be what is anticipated or assumed in the educational plans.

- (b) List areas of "information gaps" and suggest means of breaking the "gaps."
- (c) Develop an "ideal" process of policy formulation and compare this "ideal" to a description of how educational policies are currently formulated in your country.

III. Unit 2: Microcomputer Applications

6. Performance Objectives

6.1 The purpose of this unit is to explore the use of microcomputers in helping educational planners and administrators in solving some of the problems highlighted in Unit 1 above. On completion of this unit, the participants should be able to:

- (a) Appreciate the potential of microcomputers in facilitating information exchange and processing, thus overcoming some of the problems encountered in educational planning and management;
- (b) List some of the potential uses of microcomputers in educational planning and management.

7. Instructional Activities

7.1 The Sharing of Information. In a typical organization, information flow from the operation to the management level is characterized by the summarizing and abstracting process whereby information is selectively filtered as it is passed through the organizational hierarchy. In an education system, the school administrators have detailed information about the pupils, teachers and facilities in the schools. Summary information will be passed to the educational administrators at the district level. These district administrators normally do not have access to information about individual pupils, like their academic performance, their educational life history, their socioeconomic background and their district of residence. Similarly, only sketchy information is available on individual teachers in schools. Usually, they do not know the quality of teaching of teachers, what subject they teach, their teaching load, their teaching experience and the grades they are teaching. In no way are the district administrators able to associate characteristics of individual teachers with the characteristics of the pupils taught by individual teachers concerned. In short, they do not know what is happening within a

school. For a more remote planner or administrator in the central ministry of education, much less information is available on individual schools, not to mention individual teachers. Without access to such information, it is not conceivable that the central planners and administrators can formulate policies that are ultimately meant to affect the quality of teaching and learning within individual schools. Similarly, the district administrators could hardly monitor and control the performance of pupils, teachers and schools in order to enhance school/classroom effectiveness and efficiency.

7.2 The use of microcomputers facilitate tremendously the sharing of the same information around school administrators, district and central planners, and administrators. Little effort would be involved in transferring data files from schools to the district education offices and to the central ministry of education, as well as providing comparative feedback on performance to districts and schools.

7.3 Deconcentration of Planning/Administrative Functions. District administrators know the problems in their district better than their counterparts in the central ministry of education. Yet it is their counterparts who formulate and decide the educational programmes for their districts. The concentration of planning activities is partly due to the need to have efficiency in planning, and partly due to the fact that the district administrators do not have the skill and the necessary support like computing facilities to enable them to take over the planning tasks. With the use of microcomputers, even some of the more complicated forecasting and planning models could be performed on the microcomputers installed in the district education offices. Furthermore, by using the same software developed by the central ministry of education, uniformity and standards could be maintained across different districts.

7.4 Reduction in Planning Lead time. With the use of microcomputers, the lead time required to assess the implications of any changes in the education policies, or of different planning alternatives is drastically reduced. This enables planners and administrators to respond quickly to new problems and to try out a larger number of alternatives before a decision is taken.

8. Learning Activities

8.1 This is an introductory unit, the purpose of which is to simply explore the potential uses of microcomputers in educational planning, management, and research, without technically discussing actual microcomputer applications which would be dealt with in Modules II-IV. The participants, nevertheless, will be invited to:

- (a) Comment on the potential benefits that could be derived from the use of microcomputers in educational planning and management;
- (b) List potential applications of microcomputers, first from the point of view of national level planners and decisionmakers, then from the perspective of provincial, district, and school level planners, administrators, and practitioners.

IV. Unit 3: Data Requirement Identification and Assessment

9. Learning Objectives

9.1 The main purpose of this section is to sensitize participants as to the close interrelationship between the use of statistics for report, management control, and planning, and the data collection activities. After going through this unit, the participants should:

- (a) have a basic grasp of the principal considerations governing the choice of data items in a data collection activity;
- (b) be able to adapt their data collection procedure to the changing requirements of planners and administrators.

9.2 Discussion in the section will also lead logically to Module II on the construction of the educational management information system geared to the needs of planners and administrators.

10. Instructional Activities

10.1 The Approach to be Adopted in Data Base Construction. The development of an Education Management Information System could follow a "top-down" or "bottom-up" approach, each has its merits and demerits. In this module, both approaches will be adopted:

- (a) First of all, the "top-down" approach will be used in finding out the sort of tasks required to be undertaken by planners and administrators in the central government. This will lead to an assessment of the statistical information required to help them perform these tasks;
- (b) The data requirements will be examined again from a "bottom-up" perspective, by looking at the specific tasks required to be performed by the provincial officials who are often those actually responsible for collecting the data needed by

planners and administrators in the central government. It is highly desirable to have a management information system created at the provincial level which produces immediate benefits to the provincial planners and administrators in streamlining their planning, management and data collection activities.

10.2 The Tasks of Central Planners and Administrators

10.2.1 The tasks of the central planners/administrators, as far as the use of statistics are concerned, could be grouped into three categories:

(a) Stocktaking:

- (1) What are the inputs into the education sector, in terms of:
 - the number of schools and places provided;
 - the number of teachers available;
 - school facilities, such as textbooks available;
 - their geographic distribution;
- (2) What are the outputs (or the performance) of the education sector, expressed in terms of:
 - the number of children being educated;
 - their distribution by grade;
 - their distribution by geographic district;
 - the number of children passing school leaving examinations;

(b) Diagnosis:

- (1) The access to and efficiency of education provision, which could be gauged by such indicators as:
 - the school enrollment ratio;
 - the progression rate of pupils in the system;
 - dropout rates;
 - repetition rates;
- (2) The utilization of resources in the education sector such as:
 - the rate of utilization of school buildings;
 - the occupancy rate of classrooms;
 - the financial resources required, actually available, and spent by schools;
- (3) The quality of education, reflected by proxy indicators like:
 - the average class size;
 - the pupil/teacher ratio;
 - the proportion of qualified teachers;

- teacher examination results;
 - pupil examination results;
 - average costs of pupils and cycle costs;
- (4) The question of disparity, which could be approached by repeating the analysis in (1)-(3) above for:
- different regions or districts, as far as regional disparity is concerned;
 - different types of schools, reflecting disparity viewed from another perspective;
- (c) Forecasting and Planning:
- (1) the number of school leavers who will be completing a specified level of education;
 - (2) the likely size of the student population based on a given set of assumptions as regards the future population size for the school-age group, rates of progression in the school system, etc.;
 - (3) the requirements for teachers, school buildings and other inputs into the school system, and the estimated recurrent and nonrecurrent costs required, in meeting the projected demand for education under different sets of policy objectives or assumptions;
 - (4) the required geographical distribution of educational facilities (including new school buildings to be constructed) in meeting given policy objectives (e.g., those aimed at reducing regional disparities in educational provision).

10.2.2 The diagnostic and planning techniques ((b) & (c) above) which could be employed are described in Module IV (The use of the Education Management information System for Planning) and Module III (The use of the Education Management Information System for Management Control). In the later part of this Module, the types of reports that could be produced from the data base for stocktaking purposes ((a) above) will be discussed.

10.3 The Requirements of Provincial Planners/Administrators

10.3.1 The tasks of the provincial officials will mainly be concerned with the management of schools, including the monitoring of standards, performance, etc., of individual schools, and the distribution of physical and other resources allocated by the central government between schools and subdistricts. Their tasks embrace the following:

(a) Reporting

- (1) The compilation of the routine statistical returns which form the basis of data input to the statistical system in the Ministry;
- (2) The compilation of reports on the number of pupils, number of schools, and number of teachers by type of schools and by subdistrict;

(b) Management Control

- (1) Analysis of resource utilization and allocation at the subdistrict level, similar to paragraph 5.1(b)(2) above;
- (2) The analysis of resource allocation and spending at the school level. This includes, say, the estimation of the amount of recurrent subsidy to which the schools are entitled, based on prevailing unit costs or standards and information stored in the data base on the enrollment size, number of classes, etc., and comparing the amount with that actually available to the schools concerned;
- (3) The production of special reports on those schools whose standards of operation, extent of resource utilization and availability fall below given district or national norms. Examples are:
 - names and locality of schools with their pupil/teacher ratio exceeding a given norm;
 - names and locality of schools with utilization rates higher than 50%;
 - names and locality of schools with the average expenditure per pupil smaller than a given norm;
 - examination results;
 - average costs per pupil and cycle costs;
- (4) Analysis of performance of the education system in the province, as reflected by such proxy indicators as repetition rate, promotion rate, the input/output ratio, etc. It is noted that this sort of analysis using the grade cohort survival method has to be treated with caution, unless

additional information is available on the migration of students between provinces;

(c) Planning

- (1) Results of the analysis in (a) and (b) above will give useful indicators as to which schools or subdistricts additional resource inputs (e.g. new classrooms, new library books, more teachers) are required, and their priority in terms of need. With additional information on the existing and anticipated future distribution of the school-age population, a model of school location planning could be developed.
- (2) Based on the analysis of the performance of the school system, and with additional demographic information on the future size of the school-age population, it is possible to project the likely demand for school places at the provincial level, making use of the flow model adopted in (b)(3) above. The flow model can also be extended to estimate additional expenditures, classrooms and teachers required to cope with the anticipated increase in demand. Such kinds of forecasts are useful in drawing up budget requests to the central government, and in planning for other resource inputs such as teachers, library books and other equipment, etc.

10.4 Information Items Required for the Data Base

10.4.1 This subsection examines those information items which are considered to be required in helping planners and administrators to perform the tasks mentioned in paragraph 6 above. The information items required could broadly be classified into three main categories:

- (a) Pupil data,
- (b) Teacher data, and
- (c) School data.

The above information items could further be distinguished between stock and flow data. For the purpose of this module, only the primary level of education is concerned. The approach adopted in this module could easily be adapted for junior as well as senior secondary levels.

10.4.2 Pupil Data

- (a) Stock data: The following data items (new data items which are not presently collected in the regular surveys

of schools, proposed to be included are marked with asterisks (*)):

- school code (incorporating codes for type of schools, district of schools)
- morning, afternoon or combined session
- school year
- number of pupils by grade and by age
- number of pupils by religion
- number of operating classes by grade

(b) Flow data: The following data items are proposed:

- school code
- morning or afternoon session
- school year
- number of repeaters by grade and *by sex
- number of grade 1 entrants by age and *by sex
- *number of new entrants (other than grade 1) by sex and by grade (This is particularly useful if interschool student mobility is significant.)
- number of grade 6 pupils entering and passing the relevant school leaving public examinations
- *number of graduates promoted by junior secondary schools by types

10.4.3 Teacher Data. Only the stock data are proposed as statistics on teacher mobility are difficult to collect, without having to design a rather complicated questionnaire for schools to complete. Estimation of teacher wastages could still be done by making use of stock data over time and information on the number of graduates from teacher training colleges. (The best method to collect information on teacher flow is to construct an individualized teacher statistical system. This system could be extended to include useful information on the subjects taught or could be taught by teachers, and other personnel information required for finance and management functions. For the purpose of this module, it is not proposed to explore the possibility of setting up such a teacher data base.) The following information items are proposed for the teacher file:

- school code
- morning or afternoon school
- school year
- number of teachers
 - * by sex
 - by whether public or nonpublic
 - by academic qualifications
 - by type of teachers (for primary:
head, class, religion & sport)
- number of nonteaching staff

by public or nonpublic
by type (administrative, clerical, other staff)

10.4.4 School Data. Only stock data are concerned in this module, as flow data are usually available from sources like the development or capital programme. Efforts will be made to develop a flow data file which would be useful in, say, school locational planning at the district level. The following data items are proposed for the stock data:

- name of school
- address of school
- school code
- morning, afternoon or combined session
- number of classrooms by whether owned by not by condition (good, fair, bad)
- *whether has library and number of library books
- *total incomes broken down by
 - parental contribution
 - government subsidy
 - subsidy from provincial/local authorities
 - other contributions from society
 - operating surplus from school activities
- *total recurrent expenditure broken down by
 - teacher salaries
 - salaries for nonteaching staff
 - grants to students (if applicable)
 - other charges
- *total nonrecurrent expenditure
- *estimated expenditure required to provide the desired services, by recurrent and nonrecurrent

11. Learning Activities

11.1 Agenda for Group Discussion. The purpose of group discussion is to facilitate a more in-depth discussion of the relevance of the planning and management tasks, as well as data items suggested in the course. The ultimate objective is to arrive at different possible designs for the management information system and its potential applications, so that the trainees could develop using the methodology and procedures which will be discussed in Module II.

11.2 It is advisable to divide the trainees into smaller groups in order to enlist the active participation of each and every trainee. They will be asked to:

- (a) Comment on the relevance of the tasks of the central and provincial planners and administrators outlined in the course content;

- (b) Comment on the sufficiency of the data items listed in the course content, and the practicability of collecting these data in their own district;
- (c) Suggest additional tasks for both the central and provincial planners and administrators which are not covered in the course content;
- (d) Suggest additional data items required to be collected, if any, in order to help the planners and administrators to satisfactorily perform the additional tasks as suggested in (c) above.

12. Post-Assessment

12.1 The purpose of these exercises is to evaluate to what extent the participants have understood the course content outlined above, and help the trainers in deciding the pace of the discussion, in eliciting subject matters in which the trainees have keener interests, and points which require further elaboration.

12.2 The suggested questions for the learners to answer are as follows:

- (a) What data items are required to be collected in order to estimate the number of dropouts by grade in primary schools for:
 - the country as a whole?
 - a given district?
- (b) In planning the number of additional primary schools required to be built, what are the data items which planners have to take into account? What further data items are needed to help planners decide the location of these additional schools?
- (c) Suppose you are given the task of preparing a planning proposal for the introduction of an inservice teacher training programme, what data items would you need in:
 - your argument for the desirability of and possibly the urgency in implementing a programme of inservice teacher training?
 - your estimation of the likely demand for the training?