EDUCATION MANAGEMENT INFORMATION SYSTEM (EMIS)

AND THE FORMULATION OF EDUCATION FOR ALL (EFA)

PLAN OF ACTION, 2002-2015

In Cooperation with
UNESCO Almaty Cluster Office
and the Ministry of Education of Tajikistan

Prepared by:
Charles C. Villanueva
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EDUCATION MANAGEMENT INFORMATION SYSTEM (EMIS)
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OBJECTIVES:

- rationalize the importance and need for establishing an education management information system (EMIS)
- describe the different concepts, structure and development of an EMIS
- describe the major features of an EMIS in terms of objectives, integration, dimensions, institutional framework, centres and specialization, and information flow
- discuss the concept, derivation, application and computation of performance indicators
- discuss the concept and development process of planning for Education for All
- elaborate on the essentials of formulating education for all action plan
- describe the importance of EMIS vis-à-vis formulation of EFA Plan of Action, 2002-2015
CONCEPTS AND STRUCTURE OF THE EMIS

A. RATIONALE

Governments have always accorded a high premium to education. This is well acknowledged in international declarations, and in some countries mandated by their Constitutions in addition to vital legislation and other legal documents enacted to promote education. The emerging growth in world population has correspondingly resulted in the marked increase of school children in II level of education, particularly in the primary schools. Major efforts have been directed towards enhancing educational opportunities, quality and relevance. The attempt to provide universal education at the primary and secondary levels has been a remarkable undertaking by both the public and private sectors.

The prevailing educational situation in the Member Countries of Asian and the Pacific is generally characterized by difficulties and problems in two basic areas the quality of data and the management support system. The quality of data and information in education has been a focus of concern due to a number of reported errors inaccuracies inconsistencies and misinterpretations. The inability of management to provide an adequate support system has likewise contributed to the seriousness of the problem. The poor survey structures frequent changes of concepts and definitions of objectives the lack of trained and qualified staff poor direction and organization and a shortage of hardware and software are among the most obvious areas which have not been addressed by managers. It is sad to note that the development of education management in the Member Countries remains a low priority in terms of resource allocation in Government organizations. The existing situation particularly in developing countries is far worse than in those countries that have invested in the modernization of their management information systems. Their filing systems remain manually based and disorganized. In addition schools and villages that are essentially the sources of data and information are highly dispersed and isolated by seas, rivers, forests and other natural and manmade barriers. The transportation and communication facilities are not able to facilitate the transmission of reports from the source to the users. The trends in enrolment indicate the rapid expansion of the formal and non-formal education sectors which makes it difficult to keep track of developments. The emerging demands for reliable, up-to-date and timely data and information by local and international users have alerted data producers and providers to improve their management efforts to meet these demands. The disparities experienced by some countries are caused by lack of information that would describe objectively the pace of progress and resource requirements between and among regions, provinces, townships and villages.

In many developing countries, however, the economic situation has reached a critical level which in effect has forced Governments to reduce national expenditures. At the same time as resources for educational provision have been declining, the demand for both formal and non-formal education has been gaining momentum. Because of the inability of the formal system to provide adequate facilities and the needed qualified manpower, the quality of education has been tremendously affected. The fast changing requirements of education brought about by rapid technological advancement have created a wide gap between what the school provides and what the society demands.

In brief, the problems of access, equity, quality and relevance in education can be addressed using various approaches which require a decision support system. To enable the policy and decision-
makers to determine the seriousness of these problems, the magnitude and extent of education services needed and the realistic amount of resources to deliver these services efficiently and effectively, they must have accurate, reliable and timely information on the state of education in the country. The dearth of empirical data generated through a functional and carefully designed system has resulted in the need for an education management information system (EMIS).

The establishment of a functional EMIS is however affected by a number of problems. In the Republic of Tajikistan, no less than the Deputy Minister of Education has acknowledged the various problems that restrict the Ministry to fully implement a national EMIS and more so in the oblast level. Both human and nonhuman resources are inadequate to meet the requirements; the present system of data collection does not have a standard system; data are collected by many organizations and agencies of the government; no clear-cut policy to be observed in the collection, submission, processing and utilization of data; lack of understanding and appreciation by the concerned education officials and staff in the use and application of EMIS; data are not clearly defined and not regularly collected. These are the challenges facing the country that need to be addressed so that EMIS can evolved as an important tool in generating and utilizing data and information vital to management and potential users.

B. WHAT IS AN EMIS?

The acronym EMIS stands for “Educational Management Information System”. By definition an EMIS is an organized group of information and documentation services that collects, stores processes analyzes and disseminates information for educational planning and management.

It is a collection of component parts that include inputs processes outputs and feed backs that are integrated to achieve a specific objective. It is a system for managing a large body of data and information that can be readily retrieved, processed, analyzed, and made available for use and dissemination. It is a tool that uses systems theory, together with developments in computerization, to create a comprehensive approach to the collection and use of vast quantities of information on the education and training system. As the potential users of data, managers are systematically provided with accurate and timely information so that decision-making, planning, project development and other management functions and operations can be carried out effectively. It is therefore imperative that all educational managers and programme implementors be conscious and capable of performing or managing their information systems either manually or with computers. The latter is preferred considering the new knowledge and power of the information age.

C. MAJOR FEATURES

1. Objectives

The main purpose of an EMIS is to integrate information related to the management of educational activities, and to make it available in comprehensive yet succinct ways to a variety of users. These include teachers, principals, curriculum planners, inspectorate officials, financial controllers, planners, policy advisers and political leaders, as well as parents and students. In this way, the combined information resources of the EMIS are at the service of the entire community.

The overall concept of an EMIS has given to the following objectives:

a. To improve capacities in data processing, storage, analysis and supply of educational
management information so that education planners and administrators can avail themselves of reliable and timely data

b. To co-ordinate and further improve dispersed efforts in the acquisition, processing, storage, transmission, analysis, repackaging, dissemination and use of educational management information

c. To facilitate and promote the use of relevant information by various agencies and individuals at all levels for more effective educational planning implementation and management

d. To streamline the flow of information for decision-making by reducing and eliminating duplications as well as filling information gaps

e. To provide information for policy dialogue and scenarios for development of the education system

2. Integration

Synergy and integration (Figure 1.1), underlying principles of an EMIS, can be understood in terms of eight main aspects or dimensions:

- needs of producers and users
- data
- information handling
- storage of data
- retrieval of data
- data analysis
- computer and manual procedures
- networking among EMIS centres
The EMIS operates essentially as a subsystem within the general country arrangements and organization for educational policy, planning and management. By establishing and maintaining a systematic inter-sectoral exchange and flow of information, an EMIS links the Ministry of Education to other agencies and institutions in education and other sectors that are also engaged in educational activities.

An EMIS aims to coordinate information resources such as the education statistics unit, the education information and documentation services, and units and departments holding various administrative records for education. The aim is to integrate the various sources of educational management information into one coordinated system to serve the entire country.

3. **Institutional Framework**

Every country has some kind of functioning “EMIS” no matter how limited and rudimentary the data collected may be. In some poorer countries, the EMIS is highly manual. An annual statistical report may be the principal manifestation for general public consumption.

In establishing an EMIS, existing administrative units and services - e.g., education statistics units, or those that manage teachers’ salaries, financial accounts and other administrative information - would not be merged physically or organizationally. Instead, efforts would be devoted to the rationalization and strengthening of existing structures and processes and to improvement in the coordination of information flows. All activities in the handling of educational management information are to be placed and coordinated within the same EMIS framework.

A network structure is an essential part of an EMIS. It is built around the need to link together - to facilitate the flow of information - all of the agencies and individuals involved in the collection,
processing, storage, analysis, dissemination and use of education information. Existing educational institutions together with the Ministry of Education and other Ministries (Finance, Planning, Labour, etc.) would join in setting up an EMIS.

The nature of the integrated EMIS system is depicted in Figure 1.2. It shows information linkages within the education system as well as with the private sector and non-governmental organizations.

**Figure 1.2 Relationship of Agencies**

4. EMIS Centres and Specializations

The EMIS network is built around the concept of the "EMIS centre". An EMIS comprises one or more EMIS "centres" that are information services located mainly at the national, regional and local levels.

Most EMIS centres are an integral part of the country's education system under the Ministry of Education. Some EMIS centres are identified within other sectors and agencies involved in education and training. These can be statistical or research units, educational planners based in the regions or local education officers. Some might be in the private sectors.

Each of these information services can perform range of information activities. These include collecting data related to education and training activities, checking and processing these data for storage and easy retrieval, analyzing the data to extract salient information disseminating the information and aiding in its interpretation and use as a basis for decision-making.

Thus, an EMIS centre could include any of the following:

a. An existing unit of the:

- [ ] Ministry of Education
- [x] Ministries of Finance, Planning, Labour, and others
EMIS centres can be classified into three types:

**Comprehensive area EMIS centres** are typically attached to provincial, district/country and township education offices, and are responsible for collecting and handling all management information concerning the geographical area that each covers.

**Specialized function EMIS centres** may focus on certain information functions and techniques, such as dealing only with the processing and analysis of information or in dissemination by way of publication.

**Specialized information EMIS centres** collect and store information on certain specific aspects of education, such as non-formal education pre-school, vocational or special education, or education for particular disadvantaged areas or population groups.

Each EMIS centre should be equipped to perform the tasks to meet its own constituency’s needs for educational information. This especially concerns the processing and storage of large quantities of data, rapid selection and retrieval of data, sophisticated data analysis and projections and dissemination of information. A typical centre will therefore consist of information personnel operating physical facilities for the storage of information in the form of databases and data banks for easy data retrieval, processing and analysis.

Some of the specialized EMIS centres would normally be under the authority of the central EMIS centre of the Ministry of Education. Others would be operated by other Ministries (e.g. Finance in regard to teachers’ salaries) or by private educational providers such as religious sects. The functioning of all EMIS centre would be coordinated by the Ministry of Education.

Arrangements concluded for the roles of specialized EMIS centres would, of course, be in the context of the decentralization of education within the country. Some EMIS centres would enjoy full autonomy but have an enhanced co-operative relationship with other centres.

An EMIS network is usually built by the interlinking of components such as EMIS centres and individual databases and information banks that can be regularly updated, expanded and maintained.

**5. Information Flow in the EMIS**

The flow of information is crucial in an EMIS network. In many existing linkages, information is transmitted mainly in one direction, owing to outdated management practices. For example, data on enrolment are transmitted from the schools to the district education office and then to the provincial education department or provincial EMIS, as case maybe, since not all provinces have an EMIS Centre.
Within a well-established EMIS, it is imperative that both basic data feedback information flow both ways between EMIS centres and other levels. Likewise, information products should be provided to as many other information outlets as possible in order to reach the maximum number of users.

Duplicate, redundant and sometimes even conflicting information collected and disseminated by different agencies will have to be identified. Streamlined standard formats, instruments and procedures for data collection and storage can then be developed, widely distributed and implemented.

At the same time, appropriate data flow mechanisms and channels are needed to promote the exchange of complementary information. Improvements in disseminating data to potential users are also needed. And the mandate of individual information agencies should be clearly defined.

Figure 1.3 illustrates the flow of information from the EMIS to the users at the different levels of program operation.

**Figure 1.3 Information Flow**
DESIGN AND DEVELOPMENT STAGES OF THE EMIS

There is a need for Government and the private sector to coordinate data collection activities to minimize duplication and overlap and to maximize the impact of the data collection results. A comprehensive EMIS will assist in this process.

Managing education through informed decision-making requires the availability of accurate and timely information which links together resource inputs to education teaching and learning conditions and processes and appropriate indicators of the knowledge acquired by students. In some countries the widespread use of information based decision-making has resulted in more effective and efficient planning and the identification of new information needs.

In others however failure to supply information that is timely and reliable has contributed to management inefficiencies and a reluctance on the part of decision-makers to use information. Some Ministers of Education know that data collection does not function properly and thus they do not trust it. This is also true of other senior decision-makers in education and other ministries.

Yes paradoxically, school principals and other education managers sometimes suffer from too much information this is not useable or timely. For example, valuable findings from an annual school census may not be fully exploited because of the large quantity of data collected. Also, the data may be collected tabulated and disseminated in a form difficult to interpret and use especially for people with limited understanding of statistics. There is a need for well-organized data presentation and data interpretation standards to provide managers with useful and relevant information.

Ideally the design and establishment of an EMIS should be preceded by appropriate policy development legislation and relevant administrative decisions. Government commitment is of major importance in the first instance by the Ministry of Education. This ideal prerequisite situation is particularly necessary where the EMIS is to be established by unifying and expanding existing information structures and services. In some countries, these services already undertake independent ongoing information activities for which they have sole responsibility. Hence a set of well coordinated and clearly defined legislative and administrative measures would be the first requirement in order to bring these services together under the same EMIS.

This is even necessary today as, in most countries, the formal education system includes a growing privately-funded sector, which often operates at both national and sub-national levels. It often handles information, some of which is also relevant to the responsibilities of the central government, for example, for curriculum development or teacher training certification.

A well-planned and designed EMIS will facilitate the undertaking of sequential activities relative to the development of a functional EMIS, which can be traced in Figure 2.1. The description and activities for each stage area likewise presented in this figure.

**First stage:** definition of the national development goals; statement of mission and objectives of the education system; and setting short and long-range targets. These are usually reflected in the national development plan of the country. From these goals, the national objectives of education are formulated to synchronize with the national vision for development in a given time frame. The mandates of the Constitution on education and other relevant educational legislation have to be carefully reviewed with reference to the development of the management information system.
Second stage: policy decision for purposes of implementation and monitoring. The resources needed to establish the EMIS are identified at this stage of the development. It is critical to determine the appropriate manpower to operate the system, the cost of services and activities, the overall structure, the timetable of activities and the overall strategies of implementation.

Third stage: identification of data needs and requirements. The necessary data needed to support the various measures in determining the attainment of the objectives of the system shall be carefully identified through consultations with the different sectors, and key officials school administrators and other potential data users. This will ensure that the data requirements and needs of the policy and decision-makers and other key users are taken care of while at the same time minimizing overloads of unnecessary data. The specific purpose and use of these data shall be made clear at this stage of the process.

Fourth stage: establishment of databases. A database is an integrated collection of data and information, organized and stored in a manner that facilitate retrieval. Both manual and computer-based databases determine the nature of the files or the filing system. Proper labeling of these databases and the corresponding data elements is necessary for easy viewing and access to the hard/printed copies. The label is patterned after the cluster of similar data or related to the major component of the programme students teachers curriculum, finances, physical facilities and equipment, and others.
Fifth stage: design of monitoring/data gathering forms. These forms are designed to capture the required and needed data identified during the third stage of development. The designer of the questionnaire has the option to choose the appropriate modes and channels of collecting data from various sources. Forms are pilot-tested to ensure that the instructions, data definitions and data elements requested are understood by the data providers before these forms are administered on a wider or national scale.

Sixth stage: data and information collection. A Manual of Operation has to be prepared to spell out the essential information about data collection in terms of the objectives the schedule of activities, guidelines for conducting the survey/data gathering, the duties and responsibilities of the monitors/surveyors and supervisors, the specific instructions on how to administer the questionnaire including definition of terms, and the collection or submission of completed questionnaire forms. It is also at this stage that training takes place for those who will be involved in data gathering activities both at the national and sub-national levels for purposes of uniformity and common terms of reference.

Seventh stage: data processing. A system of data verification and control procedures should be applied before processing takes place. These forms are verified as to the accuracy and consistency of the data entries. All data elements are coded according to the system designed by the programmer. A training session may take place at this stage to train data encoders/data entry operators to interpret instructions, define data elements and apply software in uniform ways. The specifications of the reports to be generated from the processed data are also defined at this stage.

Eighth stage: data dissemination and report generation. The packaging of these data into statistical bulletins, compendia, reports, profiles and others will help facilitate the dissemination and use of the data by the users. At the national level, the Ministers, legislators, the members of Cabinets/Parliaments and heads of international bodies need this information for policy making, legislation, programme development and other national concerns. The middle-level manages, including bureaucrats, need it for organization and control, project implementation, budget preparation, programming, monitoring and evaluation. At the operational level, coordinators, local organizations/units and desk offices need information for their day-to-day operations, supervision, reporting, action planning, and advocacy and mobilization activities. The general public, such as the business sector the community, the professionals, the students, the media and academic or educational institutions are considered interest groups for data consumption and information users who participate in sustaining the development process.

Ninth stage: evaluation of the output. The ultimate end of an EMIS is to produce relevant and timely information of good quality. Towards this end, an evaluation mechanism should be designed to identify the strengths and shortcomings encountered in the development and operation of the EMIS. The results of the evaluation process are the basis for the strengthening of the system.

EDUCATION INFORMATION AND CHANGES IN EDUCATIONAL MANAGEMENT

A. Changes in Educational Management

Education systems have become more complex and demands have increased on the various levels of those systems. In particular, there is evidence that direct and meaningful participation in the processes of educational decision-making leads to improvement in quality. Consequently, in recent years, greater interest has been shown in the decentralization of educational decision-
making and in community involvement as a means by which education systems might become more aware of and responsive to educational needs.

Effective teaching and learning take place in a wider administrative and socio-economic context which must support what teachers do and in other ways assist in creating the conditions necessary for improvement in educational quality. This is the task of educational management.

For example, improvement in literacy is significant in breaking the cycle of poverty in some rural areas. The quality of decisions made by others at district, regional and national levels can influence, therefore, what occurs in the classroom and school.

B. Information Needs

It is necessary to communicate information in ways that are relevant and understandable to the recipient group. The nature of the information and the ways in which it is provided should therefore be tailor-made for each level in the education system.

1. Parents

Parents comprise the majority of the group of citizens often referred to collectively as the “community” in discussions on strengthening “community participation” in education.

Parents want to know how well the school is preparing their children for further education, employment and citizenship in general. This information needs is even more important for those parents who have a choice as to whether or not to send their child(ren) to a fee-paying private school.

2. Teachers

At this level also, there is a need for information that is clearly related to the teaching-learning process. Overall test scores that cover whole subject areas are often not very useful. More helpful is information that focuses on specific aspects of individual curriculum areas.

For example, information on progress in one’s native language may include sub-skill development such as spelling, understanding simple sentences and basic rules of grammar. Teachers will be interested in performance as shown by profiles of individual students, as well as performance across sub-areas and sub-skills. Such indicators of education will be used to identify aspects of teaching that require improvement. Educational management should ensure that teachers receive this kind of information, and assist them to use it.

3. Principals/Head Masters

The school principal needs several points of comparison to know the dimensions and at which grade levels his/her school is progressing in comparison with similar schools and with all schools in the school district.

The first point of comparison would be a relative measure of performance focused on the performance level of the school with respect to other schools. The second would be an absolute measure of performance aimed at providing an indication of the amount of the intended curriculum that has been mastered by the students.
A relative measure of performance could be constructed by comparing school mean scores on the same dimensions with other similar schools within the same school district, or elsewhere. The term “similar” here refers to other schools serving students from the same kind of socio-economic background, having the same standard of staff and equipment, and teaching the same curriculum. Comparisons between these schools could be carried out using breakdown variables which define important groups of students within schools in terms of gender, age or other factor, e.g. if belonging to a disadvantaged group.

4. Oblast Education Officers

Some of these officials may be school inspectors or supervisors. In countries where this level exists, OEOs are usually concerned with monitoring educational inputs and processes such as enrollments and absenteeism. They also in other ways assist the work of the next level of educational decision-makers and planners. In many larger countries these are provincial or state-level personnel.

5. Regional, Provincial and State-Level Officials

These educational managers and planners are mainly interested in the efficient deployment of resources under their jurisdiction so that all schools for which they are responsible have an opportunity to optimize the quality of their educational environments.

Besides staff and equipment, these resources may consist of less tangible resources such as information and innovative ideas that improve educational outcomes without requiring substantial financial inputs. An example of a deployment of the latter type of resource would be found in a situation where teacher-constructed curriculum materials that have been shown to improve learning are shared with other schools as part of a pool of proven teaching aids.

The main task of educational managers at the provincial level is to look for patterns of results for broad subject areas (rather than specific dimensions) in order to locate opportunities for the state or province to target resources in a more effective and efficient manner. This process may uncover cluster (groupings) of schools whose students perform poorly, e.g. in their native language, but well in mathematics and science. The existence of such a cluster should prompt an investigation into the reasons for this discrepancy in performance.

6. Inspectors and Supervisors

Personnel of curriculum departments also require information on the academic progress of students in subject areas. Such data are also necessary by province, district and school levels so that the Inspectorate can monitor and where needed help improve the performance of teachers in different subject areas.

7. National Officials

The national official's task is to address issues concerning the key indicators to be used to judge the performance of the education system as a whole. In the past many countries have employed “coarse” performance indicators concerned with enrolment rates and graduation rates. More recently, there has been greater interest in highly specific indicators concerned with such matters as attendance rates, retention rates, student achievement level and discipline problems.

The general pattern of these information needs, and examples, are depicted and summarized in Figure 3.1
C. Forms of Participation in Educational Management

Participation in educational management and decision-making may take several forms.

- **Consultative management:** parents, professionals, employers, industry representatives and community members are consulted on matters related to education. They are not involved in decision-making. For example, a regional director of education may consult widely with industrial leaders in the area concerning improvements to the vocational education curriculum before decisions are taken as to what should be done.

- **Participatory management:** representatives of interested groups participate in the decision-making process sometimes with equal voting rights. For example, a city council's education committee may include representatives from the teacher union, parent associations and the local youth organization. In this way, the "outside" groups can have greater influence in decision-making and management in education.

- **Direct involvement in educational management at “grassroots” level:** groups of individuals at local, district or regional level identify problems, sound out options and plan educational strategies. For example, a small group of parents and teachers may work together to improve literacy education by developing reading materials that focus on local traditions or special events.
### Figure 3.1 Information Needs of Different Decision-Making Levels

<table>
<thead>
<tr>
<th>LEVEL/GROUP</th>
<th>TYPE OF INFORMATION NEEDS AND EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>Learning Achievement of Children • Periodic Test Scores • Monthly/Annual report card • Remarks/Feedbacks from teachers and school principal/head master</td>
</tr>
<tr>
<td>Teachers</td>
<td>Student Learning Achievement • Inspectors/supervisors' report on teachers • PTA's meeting proceedings</td>
</tr>
<tr>
<td>School Head</td>
<td>Student Learning Achievement • Teacher's Performance Rating • Supervisor's Observation • PTA's meeting Proceedings • Community Participation Report</td>
</tr>
<tr>
<td>Oblast Education Officers</td>
<td>Teachers qualification • Student Learning Achievement • Teacher's Performance Rating • Teachers Attendance • Student Learning Achievement • Inspectors/Supervisor Reports • School Heads Activities</td>
</tr>
<tr>
<td>Ministry and State Officials</td>
<td>Utilization of Teachers • Utilization of Teaching Materials • Procurement and Utilization of Facilities • Report on Financial Resources</td>
</tr>
<tr>
<td>Inspectors/Supervisors/ Co-Ordinators/ Specialists</td>
<td>Teachers Performance • Report on Teachers Classroom work • Teachers Attendance</td>
</tr>
<tr>
<td>National Officials</td>
<td>Student enrolment, performance /achievement levels • Hiring and utilization of teachers • Monitoring reports from different levels • Development activities of teachers and school heads</td>
</tr>
</tbody>
</table>
D. Information and Educational Management

Data for information needed in the management of education is provided in essentially one of two ways, or flows, of direction.

Both vertical and horizontal information dissemination are important if all involved in decisions are to be kept informed and to their work effectively and efficiently.

- **Vertical communication.** Information is frequently requested by persons at district, regional and national levels, and the information flow is often one way - upwards. However, a two-way communication flow is important. For example, school principals require feedback on information they collected for the Ministry of Education, in particular in any special survey.

- **Horizontal communication.** Information involves communication between different but overlapping areas of government to ensure that the services necessary for the functioning of schools are provided and maintained. For example, regarding the provision of a clean water supply to a school, the principal might have to communicate directly with the relevant ministry at district or regional level rather than through the district or provincial office of the Ministry of Education.

Each mode of information transmission is necessary for educational management, in different circumstances. It is also important that educational managers receive information in a vertical or horizontal manner as circumstances require.

Establishment of an EMIS requires both. This is true with respect to decentralization in education, also in other important areas of educational management - such as educational finance.

E. Decentralization and Educational Management

The discussion so far has focused on issues related to broadening the basis for educational decision-making. Decentralization aims to have decisions that closely reflect “grass roots” educational needs - and which are more likely to result in desired improvements in educational quality - made at the local level.

Involvement of a wider group in the community is also considered more likely to strengthen commitment to successful implementation of decision and a commitment to initiating needed changes at the local level.

In recent years many educators have become increasingly aware of the shortcomings of the centralized nature of education systems in developing countries. Decentralization is reflected in different forms.

1. **Types of Decentralization**

- **Deconcentration** refers to the establishment of units of the central authority in different parts of the country. The units may be different levels: regional, district or cluster bodies. Deconcentration may be the first step towards greater local autonomy, and can certainly make the system more sensitive to local issues. However, the staff are still employees of the central ministry and remain accountable to it.
Delegation of power implies stronger local autonomy. In law, the powers still rest with the central Ministry of Education, which can withdraw them at any time. Meanwhile, the ministry may choose to “lend” powers to provincial or local authorities.

Devolution is the strongest of the three types. Here the central ministry transfers decision-making powers to the local bodies and no longer has any power over them.

These three types or “levels” of decentralization imply corresponding degrees of central control.

A common type of decentralization involves several nearby schools forging a “cluster,” often for the purpose of sharing teachers. Improved educational management through decentralization is also an objective in a cluster arrangement, where one school principal assumes certain responsibilities for other schools in the cluster.

Central ministry officials who fear that clusters might operate badly or might make decisions that disrupt the overall education system of the country could choose déconcentration or delegation rather than devolution, and the administrative and legal framework would be adjusted accordingly.

2. Advantages of Decentralization

- Improved decision-making. Even in small countries it is impossible for staff in a central Ministry of Education to have detailed knowledge of each school and each community. Centralized systems often produce decisions that are inappropriate.
  
  In some school systems even minor decisions, such as the appointment of school cleaners, can only be taken by the central authorities. The process is often slow and cumbersome, and the final decision is taken by people without intimate knowledge of either the candidates of the jobs to be done. Decentralization can speed up and improve the process.

  Decentralized systems can be much more sensitive to local needs. This is true because feedback on changes needed in the education system at the school level are more immediately perceived or noticed by those who have a responsibility to make improvements.

  Two examples may illustrate this point. It may seem desirable to open a new school in a certain location. But more detailed knowledge of community rivalries and other factors might lead to a quite different conclusion. Second, policies prohibiting the employment of untrained teachers may make sense from a central government perspective, but they may be counterproductive in communities where the only teachers available are untrained. Local decision-making would have led to a different policy.

- Participation. Most centralized systems are highly authoritarian. Decisions are taken at the top and are handed down there is little scope for bottom-up decision-making. Decentralization can be a vehicle for promoting participation by parents, professionals and other members of the community.
Education Management Information System

- **Encouragement for innovation.** Centralized systems are well suited to innovations initiated at the top since central government decision-makers are likely to have both the authority and the resources to introduce changes. However, centralized systems tend to discourage local initiatives. Even when lower-level officials perceive local problems and ways to solve them they rarely have the authority to introduce changes.

Decentralized systems can therefore be much more flexible and can encourage local innovation. The challenge for decision-makers is to find a balance between central authority, local needs and in general the interests of all concerned. Information is an important component of this process, especially at the school level.

- **Improved planning.** For all the above reasons it is often argued that decentralization can improve planning. Planners can have access to detailed local knowledge on which to base their plans, and local administrators are likely to be more committed to implementation of those plans.

3. **Shortcomings**

The perspective from which one looks at change and reform in education may lead to very different interpretations. For example, although from one angle a cluster scheme seems like a form of decentralization from high levels of authority, from another angle, it is a form of centralization that reduces the autonomy of individual schools.

For other reasons decentralized systems are not necessarily more efficient than centralized ones:

- If decentralization leads to too much diversity there may be problems of coordination.
- Instead of speeding up decision-making, decentralized systems may have so many levels of responsibility and authority that they are highly bureaucratic and slow.
- Sometimes decentralization may require employment of extra staff, thus an additional cost is incurred.
- Local staff and communities do not always have the required expertise to make appropriate decisions.
- Local decision-making processes are often strongly influenced by local politics, more distant decision-making may be more impartial.

4. **Self-managing Schools**

The self-managing school can be defined as one in which there has been significant and consistent decentralization to the school level of authority to make decisions related to the allocation of resources. This decentralization is administrative rather than political with decisions at the school level being made within a framework of local, state or national policies and guidelines.

The school remains accountable to the central authority for the manner in which resources are allocated, including decisions on:

- **curriculum:** goals and purposes of schooling
Education Management Information System

- **pedagogy**: means of teaching and learning
- **power**: to make decisions
- **materials**: use of supplies and equipment
- **people**: allocation of staff to duties
- **time**: allocation and utilization
- **finance**: use of school financial resources (from central government and locally raised)

The common thread in moves toward decentralization has been the shift of power - to make certain kinds of decisions - from the central authority to lower levels in the system hierarchy regional, district, city/village and local school levels. Management decisions made in this way relate more closely to the emerging needs of the school, which are more appropriately targeted and, therefore, and more likely to result in improvement in educational quality.

It is important to note that in each approach to decentralization, the school still continues to work within the policies and priorities of the central authority and, more broadly, within the context of national economic goals and priorities.

**F. Strategies for Improving Community Participation**

The following approaches to strengthening community participation are recommended:

- Maximize commitment to its utility
- Improve orientation to it
- Recognize obstacles
- Improve leadership training
- Delegate responsibility
- Improve information dissemination
- Increase professional cooperation
- Improve communication using appropriate terms and concepts
- Facilitate participation by arranging meetings at appropriate times/in appropriate places (some parents may be intimidated if meetings occur in the principal's office)
- Improve resources and support
- Exercise patience and develop realistic expectations (change takes time)

**G. Obstacles to Effective Participation**

These need to be considered by educational managers, including information implications to overcome the obstacles.

- **No traditions or culture of participation.** In some countries cultural values place most importance upon decisions made at the government level. There is little or no experience in this kind of participation and therefore communities are unable or unwilling to participate.

- become involved in it. In addition, differences of class, religion or ethnicity within the community could lead to domination by the local elite and effectively limit the involvement of others in decision-making.

- **Resistance to change.** Individuals, as well as the education systems within which they work, can be resistant to change or unable to change. For example, during an
Innovative literacy program, in which children produced their own texts for the school library, some teachers were concerned only that the texts did not interfere with the academic-oriented aspects of the curriculum. In a few countries, many people believe that teachers know better than parents, and that parents offer little of use to the school.

- **Lack of resources.** This refers to finances, personnel, voluntary labour and time. Busy teachers and parents struggling for survival do not find it easy to participate in time-consuming activities such as meetings or helping to collect information for an EMIS. The passivity and illiteracy in some communities adds to the problem, and where there is little funding available to the school, or when guidance does not come from regional or central EMIS centres, educational staff may see participation as not worth their effort.

- **Lack of skills and knowledge.** Participation by the community in education requires certain knowledge and skills often not easy for an education system to foster. For example, parents encouraged to look more actively at their children’s schooling must be educated to look beyond examination results to see other benefits, such as life skills training, that should receive equal attention. In relation to an EMIS, it is important that those who are to participate in information collection or analysis are committed to it, and also receive appropriate training for their role in data collection.

- **Distance and time.** Physical distances, as well as the time taken to travel between communities, make participation for some parents very difficult, if not impossible. This is made more burdensome by inadequate roads and lack of transport. Cultural factors and family obligations in many countries would prohibit participation by women in the evenings.

This obstacle is a particularly important constraint for an EMIS where timely reporting of data is concerned. It may be necessary, for example, to come up with new faster ways for the communication of data.

**IDENTIFICATION OF INDICATORS**

After information needs for the EMIS have been specified, they must be operationalized as a set of indicators.

Indicators are first identified and described, then they can be computed or measured. Measurement, or assigning a value to indicators, is part of the data collection and analysis process.

In order to properly measure and evaluate the performance of any programme, a number of performance indicators have to be identified and developed. In the absence of true and empirical measures, performance indicators are an acceptable means to gauge the performance of a system or the implementation of a programme. Performance indicators also attempt to describe the dynamics of the system rather than simple time “snapshots.” In order to better understand a system, particularly when the aim is for the system to reach a particular target by a certain time, a description of the dynamics of the process is required. It is necessary also to describe the interaction of the various components and to monitor progress. Some indicators are to be measured on an annual basis, such as the enrolment ratio or drop-out ratio. Others are to be computed on a regular other than
annual basis, in particular, indicators (such as those found in a census) whose values are not expected to dramatically change from one year to another. These are also indicators to be computed by way of special studies, primarily using statistical sampling methods and techniques, for example, a socio-economic and education mapping needs survey.

A. FRAMEWORK: THE "EDUCATION PRODUCTION FUNCTION"

For purposes of evaluation, and to assist in development of the EMIS, the education system can be viewed as a form of "production." The system has four components:

**Inputs:** real resources used in education, e.g., the characteristics of students, teachers and other personnel, also curriculum, textbooks, facilities and equipment financial resources, and the foregone earnings of students.

**Processes:** the interactions between students and inputs and among in teaching/learning processes and contexts (in the classroom or library. Attendance and absenteeism by students and teachers and such factors as administrative characteristics (e.g., autonomy) are other examples.

**Outputs:** the direct and more immediate results or effects of education such a students graduated and increments to test scores.

**Outcomes:** ultimate or eventual effects of education such as increased earnings employment contribution to productivity improved health, decreased crime and other non-monetary outcomes of education. Indicators are usually classified as belonging to one or other of these four categories. (Inputs and processes are sometimes jointly described as resources or determinants. Similarly, outputs and outcomes are termed results or effects).

This is the most common classification in educational evaluation and is illustrated in Figure 6.1. "Factors in the Education Production Process." Examples are included of the kinds of observable and measurable variables that may be categorized as belonging within each stage of the education production function.

B. DEFINITION AND DESCRIPTION

1. Type of Indicators

The following types of indicators serve as measures of whatever change or improvement or progress the programme has brought to an area or system.

**Input Indicators** are measures for the effectiveness of resources used in the education production activity. The determinants are characteristics of students, schools, teachers, facilities, instructional materials and equipment. In each case the term "characteristics" refers to the availability of a resource its nature and quality an its manner and rate of use.

**Process indicators** are measures that determine the interaction taking place among inputs. Normally, they require the collection of data through the observation of behaviour.

**Output indicators** are measures to determine the immediate effects of the educational activity, e.g., attainment effects, achievement effects, attitudinal / behaviour effects and equity effects.

**Qualitative indicators** are intended to measure the quality of the outcome of the system and also the quality of schooling inputs. They measure performance relative to some given standards and norms.
Quantitative indicators measure statistically the amount or value of inputs or resources available.

Efficiency indicators are used to monitor the attainment of one of the programme’s or system’s objectives producing quick results at the least possible cost. Cost is basically the expenditures associated with the use of resources such as personnel or equipment. Likewise, cost measures the degree of utilization of the resources that are available to the system.

Equity indicators are used to measure the degree to which expenditures for education are provided for the population regardless of economic status, place of residence and intellectual capability. These also measure quality of access not only to physical facilities such as schools but also to quality education.

Figure 6.1 Factors in the Education Production Process

2. General Identification

Indicators are measures of a component - or of the interaction or relationship of components of education (input, process, output or outcome). This includes individual (student, teacher) and/or system performance along dimensions judged important in planning and resource allocation e.g. test scores as an indicator of student achievement.
Education indicators are statistics that enable management to monitor effectiveness and efficiency in the delivery of education services. This usually enables judgements on key aspects of the functioning of the education system.

The need for indicators is to have useful tools to identify and measure changes in the education system over time including the effect of planned interventions. When indicators are produced on a regular basis they can reveal possible changes in response to policy action.

However, an indicator provides only a general rather than a precise observation on what it relates to e.g., a pupil/teacher ratio.

- Indicators summarize a large amount of data to provide a broad reflection or general indication of the situation under investigation. Indicators do not necessarily comment on a desirable or undesirable situation (that may or may not exist).
- They provide a glance or simple time “snapshot” a profile of current conditions. They can reveal new understandings but not a precise measurement or judgements.
- An indicator can reveal something about the performance or behaviour of an education system. But as indicators are short cuts abbreviations or proxies to represent an underlying reality interpretation should be modest.

Many education indicators reflect something about the quality of schooling. An indicator must have at least one other reference point - an agreed standard, past measurement or comparison across schools against which it can be compared.

Besides covering all four components (especially input, process and output) of the education system (see Annex II), indicators should also be developed for reference to factors outside the system. These could include additional indicators for accountability to the society at large.

Non-education data could include indicators on changes in population and labour force economic growth, national income and the Government budget.

It is costly and challenging to set up an EMIS with a wide range of indicators. Initial focus should be on a small range of indicators that are deemed important by all concerned and to explore how these can be used in planning at different levels.

The selection of indicators begins with the objectives, strategies and targets of the national educational development plan. Recent emphasis on Education for All (EFA) adds an additional impetus for an EMIS and the requirement to have an appropriate set of indicators to monitor it. There is an important difference between the two major types of indicators - simple indicators (sometimes referred to as descriptors) and performance indicators.

3. **Simple Indicators**

These measure identification of one aspect of education at a point in time and over time. They are also called descriptive indicators, first-order indicators or single variable indicators.

Measurement is computed by a number or percentage. Examples include numbers of trained teachers overall or in different subject areas, and enrolment rates, e.g., gross, net age-specific.
Simple indicators do not usually reflect any particular aspect of quality in education. They are useful when they task is to measure quantitative progress towards numerical educational targets such as enrolments.

4. Performance Indicators

To understand the system's performance in reflecting a qualitative or efficiency (use of resources) dimension, a measure of the dynamics or interactions of the process is required.

An indicator of education performance is defined as the relationship between one component of the educational system - pupils - and another such as teachers in terms of their interaction within the system. Two variables are combined to form a ratio indicator. It is measured or "derived" from two variables.

Performance indicators relate inputs to process or outputs to inputs. Examples include student/teacher ratio units, and textbooks per student.

These indicators can be calculated as desired after the required data are collected and information is generated on the necessary single variable indicators.

A composite indicator is formed through statistical analysis of more than two variables.

5. Property of Measurement

Any indicator is always quantifiable in a precise arithmetic form. Its measurement is a real number to be interpreted in accordance with the procedure (rules) of its formation.

Frequently, the numbers (measurements of the same indicator) are integrated into a data series and indicate a trend over time e.g., pupil/teacher ratio.

Sometimes the measurement is a percentage e.g., 22% of all or a certain group of teachers had completed training (however defined) for their work. This is a simple indicator.

A ratio is the other most common measure e.g., 30:1 which could be a pupil/teacher ratio. This is for a performance indicator and is formed (derived) by combining the measurement of two simple indicators.

6. Indirect Indicators

These are statistics on factors not directly related to education but which affect it and what happens in the classroom.

Examples are in the social and socio-economic environment, and include the extent of access that students - and teachers - have to vaccinations clean water good roads and adequate transportation to get to school as well as the distance from home to school.

7. Time Series

Although an indicator reflects a situation at a specify point in time most indicators in education have a series of values calculated over time on an ongoing basis, usually each year.
Examples include indicators of the costs of education such as expenditure per student. A time series enables education managers to monitor casual changes in particular aspects of the education system.

Also, the trend over time of such an indicator can be compared with values for other components of the education system. Measurement of per pupil expenditure could be contrasted with that for textbooks per pupil, for example.

8. Narrative and Visual Description

A standard format (template) should be developed to summarize the identification specifications and measurement of each indicator. For use-friendly pupil consumption the level of language should as far as possible avoid technical jargon. A statistical table and accompanying graph(s) can usefully be included especially for performance indicators.

Comparisons with an objective and with previous years should also appear. Once established - with a set of indicators not likely to change for some time - additional comparisons can be added. Two versions could be considered: a fairly detailed report (including a statement of the methodology used) for an audience closely involved with education (policy makers, planner principles, teachers, parent groups), and a shorter version for the general public.

C. CHARACTERISTICS AND CLASSIFICATIONS

1. General Features

A good indicator, when measured, has the following properties:

a) focuses on measurable variables
b) describes central features of the education system
c) links to the system's goals by providing a measure of progress or change
d) relevant to education policy
e) problem oriented
f) possesses some predictive value
g) generally accepted as statistically valid and reliable
h) data scope or elements are collectible in terms of time, expertise and cost
i) comprehensive and meaningful
j) understandable to all major interested users
k) identifies trends over time
l) applicable or useful at different levels (national to sub-national, to management to grassroots/schools)

A specific indicator of education can be characterized using the following descriptive elements, as illustrated.
### Characteristics | Description
--- | ---
**Short Title:** | Input Indicator

**Descriptive Title:** | Learner-Primer Ratio/Student-textbook Ratio

**Objective:** | To determine the primer/textbook utilization by the learners in a given academic year

**Rationale and Relevance:** | Efficiency in the distribution and extent of utilization of the textbooks/primmers

**Level in the education System:** | Formal Basic Education and Non-formal education

**Breakdown: Level of Aggregation**
- Grade Level
- Gender
- Value

**Formula to Calculate the Value:**
\[ STR = \frac{\text{Total Enrolment (Primary Class)}}{\text{Total No. of Copies of the Textbooks}} \]

**Source of Data:** | Primary Source (School teacher/School Head)

**Validity:** | Cross-checking with the data at the central or provincial education office

**Frequency of Calculation (Measurement):** | Annual/Yearly

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2. **"Nature" of Indicators**

For convenience, and to assist in analysis the four factors of education production discussed above - inputs, processes, outputs and outcomes are often described as constituting the "nature" of education indicators. In other words, any indicator can be categorized as being (in the nature of) an input, process output or outcome of education.
a) **Input indicators** are resources (determinants) subject to policy manipulation e.g. the characteristics of students, teachers curriculum textbooks other instructional materials, facilitates equipment, students capacity for learning, and other resources. Inputs of financial resources include expenditures on teacher salaries equipment and classrooms etc.

b) **Process indicators** are determinants (and are also resources) that reflect forms of interaction between teachers, students, administrators, materials and technology. They concern decisions by educational management on factors that can be manipulated (for example) in the teaching/learning process such as instructional time.

Process indicators refers to the procedures or techniques that determine the transition of inputs into outputs an are thus of evaluative importance.

**Process indicators are important at multiple levels and have multiple measurement applications - to users at national and local levels including schools managers and teachers. The processes are either administrative/managerial or instructional in nature.**

These indicators have included the distribution (allocation) of teacher time between various instructional tasks (especially contact hours with students in the classroom) and other duties. Another major "process" indicator is the use or mix of educational technologies such as the degree to which audio-visual aids are used in the classroom.

Process indicators are more important at lower levels (e.g. for school principals regarding self-evaluation). Moreover most indicators of process reflect an interest in what happens at the school level and inside the classroom.

Examples at the country (and if applicable regional/provincial/state) level include:
♦ number of school days in the school year
♦ number of years to complete a programme of studies (level of education)
♦ number of subjects passed (or credited) to graduate
♦ absenteeism of teachers
♦ absenteeism of students
♦ drop-out rates
♦ repetition rates

Examples at the school level include:
♦ school organization
♦ school "climate"
♦ educational leadership

Examples at the classroom level include:
♦ learning processes (e.g. use of audio-visual aids)
♦ attendance
♦ time in class
♦ library use
♦ homework assigned
c) **Output indicators** are results (effects) or changes readily observable on completion of a level of education. These indicators are mainly on student attainment and student achievement (test scores that reflect value added).

Attitudinal and behavioural characteristics (effects) of students evident on completion of schooling, are also direct outputs that can be measured. They include motivation, discipline and similar factors.

Effects on equity (fairness of treatment in all aspects of the education system) are also outputs of education, but of a different kind. They provide interpretation of inputs processes and other outputs as well as outcomes (and are discussed separately in Section G below).

d) **Outcome indicators** are results and effects on individuals an society as a whole (sometimes termed “value added”) that are evident over time as a consequence, or following interaction of educational outputs with the societal and socio-economic context. These education outcomes are effects more distant in time after completing education, and are usually more dispersed in occurrence than education outputs. The main indicators of outcome are:

- extent of retention of learning and skills acquired, e.g. literacy and numeracy) several years later
- admission to further education and training
- achievement in subsequent education and training

The most common outcomes are on graduates or those who completed education. Such indicators are an individual’s subsequent

- employment (or unemployment, or underemployment)
- earnings, especially initially on job entry

These should be measured by education level age and gender.

Other outcome indicators of these individuals include:

- job satisfaction
- consumption behaviour
- career development and progression
- life satisfaction
- personal behaviour, attitudes and contribution to society

However, individuals who did not receive education are also affected by education outcomes. This effects is called “externalities”. These results or effects are unintended and are on other individuals or on the society in general (including the graduates).

Indicators of externalities include:

- better health
- democratization
3. Types of Indicators

Indicators can also be categorized (grouped) in several other ways such as indicators of quality, material resources input, education finance, human resources, access and participation, internal efficiency, external efficiency, and learning needs. These categories are not mutually exclusive.

An important categorization is by level of application of the indicator, and of use to different groups of users. The levels are: country, region/province/state, district or municipality, school cluster or community, school, classroom.

Indicators are commonly classified as reflecting one of two "types" quantity or quality in education. All indicators measure quantity, but for many indicators the value (measurement) at any given time also reflects a dimension of quality.

a) Indicators of quantity

The term "quantity" refers to evidence that there is (has been) more, or less, of something - the proportion or total number of students who pass the primary school leaving examination. The quantity reflects a numerical condition - the number of students, teachers, costs, facilities or textbooks at a specified time.

Quantity can refer to an input, process, output or outcome dimension of education.

Examples of quantitative indicators include:

**Inputs**

- student enrolments (percentage, including of females)
- gross enrolment ratio
- net enrolment ratio
- average daily attendance

**costs**

- expenditure per pupil - by level and urban/rural

**Facilities and equipment** by level and urban/rural

- facilities
- classrooms
- textbooks by level and urban/rural

- issued to students
- available in school library
Outputs:

- Students progression (number, including of females) by grade level,
- Urban/rural examination passes

b. **Indicators of quality.** The notion of "quality" refers to the extent of possession of particular desired attribute or characteristic. An underlying positive value is assumed.

Common perceptions or definitions of quality include reference to value added, standards, reputation, efficiency and availability of resources.

The indicator as identified and defined is said to have or possess a certain desired quality such as one of the above, which its value (measurement) reflects. Indicators of quality are usually performance indicators and not simple indicators.

The concept of "quality" can mean different things depending upon the context. Here we use it to refer to a perceived (measured) improvement in the achievement of educational goals and objectives (effectiveness), and/or in the use of resources in doing so (efficiency).

Quality can be reflected as efficiency in reaching standards of attainment, in improving standards, or even as having standards. Relevance of education to the individual and to society as a whole is another example. (Obtaining high quality, of getting "something special" from education, might be challenging to measure, even though it could be very real to a student).

Many "quality of education" indicators reflect a quantitative improvement in the delivery of educational services (e.g., more textbooks per class). Sometimes the distinction can be somewhat blurred; thus indicators that are mainly viewed as quantitative indicators can also reflect an element of quality of the education input, output or process.

Other examples are an increase in the number of teachers relative to the average number of students in a classroom, and reduction in drop out rates. Both are commonly assumed to be indicators of improvements in the quality of education.

Any change in the proportion of trained teachers says something more than just the quantity who are trained (however defined). An indicator of this numerical change also says something about the changing quality of the teaching force. This is because an increased proportion of trained teachers is taken to mean increased quality of education provision.

A more useful reflection of quality would be to also include specific teacher attributes that can be measured so that a value can be put on them. The number (quantity) of trained teachers who have science or mathematics qualifications is a good example, among other reasons because such teachers are usually in short supply.

Such quantitative measures say something about the quality that could be ascribed to, or at least inferred from, the entire group of trained teachers included in the indicator.

Examples of qualitative indicators include:
Inputs:

- number of trained teachers, including of females by level
- shortages of teachers by level, and main teaching subject
- surpluses of teachers by level, and main teaching subject
- pupil/teacher ratio by level, and main teaching subject, and region (urban/rural)
- pupil classroom ratio
- textbook pupil ratio
- percentage of qualified teachers
- percentage of classrooms in good condition

Process:

- hours of study in class
- absenteeism (pupils, teachers)
- use of teaching aids

Outputs:

- percentage passing final examination
- employment status of graduates

An EMIS requires both quantitative indicators that measure progress towards numerical targets as well as indicators that reflect quality in the education system. Indicators of quantity should be developed first, then quality indicators can be incorporated into the system of indicators.

Although in most countries a comprehensive system of quality indicators has yet to be developed, its importance must be stressed. Quantitative assessment alone may be a sufficient component for some indicators of educational effectiveness in the EMIS, but this is not by itself adequate to assess efficiency.

D. STAGES IN THE DEVELOPMENT OF INDICATORS

Initially, an EMIS would include only a small number of indicators concerning the education data most needed. Collection of too many data without a clear plan is counterproductive.

A new EMIS should start with only a few essential indicators that are straightforward in their identification and comprehension. In many countries this EMIS would probably be based on the regular school census.

For countries with only a rudimentary EMIS, and limited resources to develop it, a set of preconditions is needed prior to investing in improved data generation. The development of indicators should of course be adapted to local conditions, and should consider all existing data sources and channels. Additional indicators would be added later as deemed appropriate and as the capacity of the EMIS increases.

In developing an EMIS, each country will have to consider how soon to have a broadly focussed EMIS to service unanticipated data needs, or one narrowly focussed concentrate on data already recognized as important. This consideration, however, is a continuum.
The best strategy is likely to be to start small and focus on clearly defined information needs, but in a way to allow incremental expansion. Starting small may not develop a political constituency of satisfied users, but starting big may lead to delay in the availability of EMIS information and less satisfaction with it, especially at the district and school levels.

The degree of detail will vary from stage to stage in different countries. However, the data will probably increase in terms of coverage, accuracy, and degree of interpretation at the second level and even more at the third level.

Gains in ease of interpretation will occur in part because of a greater capacity to assimilate data through the comparison and contrast of data sets. Thus gender ratio and students outcome measures can be combined with teacher characteristics by region and across time. This will provide important information; for example, if an increase in the number of women teachers tends to be linked to improved attendance, retention and measurable achievement of female students.

There should be a periodic review and modification of the data collected for the indicators selected.

New, or more complex indicators can be introduced as the data system and its users become more experienced in their capacity to ask meaningful questions about the quality of education.

Indicators frequently reveal unanticipated and often troubling trends in the performance of a sector. A major challenge in developing new indicators is to create an information base that promotes understanding of puzzling trends.

Sometimes, however, a new indicator would be initiated either as beginning of an intended new time series or as a "one off" special purpose indicator. A contemporary example could be indicators of community participation, such as the number of meetings annually of the local parent/teacher organization.

An EMIS can assist in the process of identifying, measuring and modifying indicators. Progress will depend on where it begins (in terms of data quality and the capacities of the decision maker), the resources available, and the importance attached to indicators of education quality.

The country's capacity to develop indicators will also be a reflection of its institution building for same including for staff development and training.

E. INDICATORS OF INTERNAL EFFICIENCY

1. Definition

Internal efficiency deals with the use of resources, and refers to the internal dynamics of the educational system in transforming inputs and processes into outputs (entrants into graduates).

Internal efficiency refers to how well - effectiveness relative to cost - the organization achieves its shorter term objectives - for example, gains, in academic achievement.

Operationally, internal efficiency may be described as the number of students graduating from an educational institution (at a particular level of education) expressed as a percentage of the number of students who entered the institution at the beginning of the particular programme. Internal efficiency thus emphasizes minimum wastage (drop-out, repetition, failure) in education.
2. Inputs

Inputs are the resources used in the education production activity. They may be divided into several general categories: students, teachers, curriculum, facilities, equipment, and instructional materials, and administrative capacity.

The dynamics of pupil flow from grade to grade through the system can be studied by calculating promotion, repetition, and withdraw (drop-out) rates. Education managers can then reconstruct the progress of a cohort or on the resulting graduates.

3. Process

This stage refers to the means by which educational inputs are transformed into or become outputs. Examples are classroom lecture/discussion, small group instruction, individual student-teacher tutorial self-study with traditional textbook or textbook-derived materials and self-study with programmed instruction.

Important questions in assessing the “process” component of internal efficiency analysis include:

- How much does the system cost?
- How is it financed?
- How are financial resources shared among different inputs or among levels of education?
- How are human resources used and what are the methods of work organization?
- How are the various human, physical and financial resources managed?
- To what extent could more satisfactory results be achieved with the same resources, perhaps if combined differently?

4. Educational Costs

These are determined by the interaction of inputs and process resources.

Ideally, education managers should be able to design the instruction/learning system by considering alternative inputs and processes simultaneously.

However, the reality is that in most developing nations serious limitations exist in terms of the availability, quality, and costs of the range of practical and affordable technologies.

Moreover, the education budget is so heavily consumed by teacher salaries that ministers, advisers, planners, and school principals have little room to maneuver. The scope of opportunity to alter education expenditures is also heavily restricted by the worsening financial resources constraints faced by most countries.

Indicators of internal efficiency:

- promotion rates by grade
- repetition rates by grade
- drop-out rates by grade
- pupil-years wasted: repetition, drop-out
- rates of transfers in/out by grade
- average study-time: drop-outs, graduates
- years of study pre graduate
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- survival rate by grade
- rate of utilization of teachers
- rate of utilization of facilities

F. INDICATORS OF EXTERNAL EFFICIENCY

1. Definition

The concept of external efficiency refers to the extent to which the education system (or component) "producing" outputs and, ultimately, outcomes that are desired by and meet the wider needs of society.

This includes how well the system of education achieves its long-term objectives - such as contributing to productive employees and good citizens.

Also, external efficiency relates inputs cost to outcomes.

Measuring the external effectiveness of education consists of evaluating the impact of the output from the point of view of the society or the economy as a whole that absorbs those who leave the system.

External efficiency deals with the effects or results of the educational system. Important questions are:

- How well are graduates prepared for integration into the labour force?
- To what degree does their work maximize economic growth?
- How much do their qualifications help improve social development?
- To what extent has the education system provided school-leavers with life-skills to contribute to the mainstream?
- What are the patterns of graduates' earnings over time?
- What is the employment experience of graduates?

Answering these questions is essential for the design of human resources development policy. Cost-benefit analysis can be difficult to apply and forecasts of qualified labour demand are sometimes not very reliable.

Attempts to "match" such forecasts with educational outputs have often not met with success.

2. Outputs

These are the immediate effects of what the education system produces. The major ones are:

- attainment effects
- learning achievement effects
- immediate attitudinal/behavioural effects
- equity effects

In certain cases, output indicators draw the attention of educators to a particular problem in the system. For example, if one-third of the pupils do not succeed in getting beyond the first year of primary school, it is no doubt more useful to tackle this problem directly than to try to increase first year admissions in low enrolment communities.
Similarly, if repetitions are reaching alarming proportions then measures such as improved tailoring of the curriculum to the average learning rate would allow for more efficient concentration of available resources on other education requirements.

Interpreting the causes of such variations is essential to find the right remedies.

Examples of alternatives for decision-makes are:

a) to change pedagogical conditions
b) to find new ways of motivating teachers (who perhaps are leaving the profession because of salary reductions)
c) to subsidize canteens and school books when pupils are finding it financially difficulty to purpose their studies because their parents need them to work in the fields and feed the family.

3. Outcomes

Outcomes are usually longer-term effects of education, over a time period extending several years. These indicators include employment, earnings, and attitudes/behaviours.

External efficiency criteria include five dimensions of outcome or ultimate impact of education on the society as a whole:

- economic
- socio-cultural
- institutional
- environmental
- political

As with the use of the indicators in efficiency analysis, the focus of outcome indicators should be on their utility in increasing the understanding of and assessing educational effectiveness and efficiency. While the examples above do not exhaust all possible types of educational outputs and outcomes they encompass the large majority of such measures commonly used as indicators of classroom school or education system effectiveness.

G. INDICATORS OF EQUITY

1. Dimensions

Equity is a means of interpreting and monitoring the extent and experience of educational opportunity between different student groups. The concept of equity refers to equality of educational opportunity among pupils in getting into and progressing through the education system and when leaving it.

Equity is concerned with access (distribution) participation (opportunities) and achievements (consequences) in education. The impact of equity is the extent to which education has a neutral negative or positive effect on the initial disadvantage of certain groups. The groups are distinguishable and overlapping and include females in general. In many countries girls are invariably one of the disadvantaged categories through progress is being made. Nevertheless, the gender gap is not just a matter of access.

Other groups include the poor, refugees, minority language populations, ethnic minorities, nomads,
refugees and street children. Also there are disadvantaged groups in most countries - for example, many rural dwellers, inhabitants of poor urban districts populations living in areas with difficult access or of low demographic density and ethnic linguistic or cultural minorities.

Thus, equity is an approach to interpreting other effects and is a measure of fairness or justice. Clearly, both are subjective considerations.

There are several important assumptions in equity analysis. One is the notion that everyone has the right to a basic education. Another is that the government has an obligation to ensure that qualified potential students are not denied schooling because they are poor or female.

Also, it is assumed that lack of equity partly reflects limited access, and also in part lower demand for education. Yet equity considerations also reflect financial and other resources constraints. Further, it is recognized that there are differences in learners and that changes are needed in educational practice.

Equity also refers to the quality of educational opportunity once in the system to benefit from the school's resources and thus in regard to output and outcome thereafter.

Equity relates to the distribution of benefits or costs, and if the distribution is perceived as just or equitable. Equity usually refers to which groups of students, as defined above, succeed in getting a good quality education. But the extent to which the distribution is right or wrong is a value judgement.

Equity issues arise in analysis of both internal efficiency and external efficiency. Sometimes the analysis overlaps both.

2. Internal Efficiency

The following questions are important in equity analysis:

- Who are the people who gain access to educational opportunities?
- To what extent does the system serve everyone the same way and does it give them equal opportunities?
- Are there unconscious, inadvertent barriers or hindrances or unavoidable biases to certain groups of students (for example, in examinations)?
- Are there disparities inequalities of treatment or even injustices vis-a-vis certain groups?
- At what rate do different groups advance and how do they find their way through different grade levels?

Access (accessibility) to educational opportunities - probably the major equity issue - refers to getting into and being able to progress in the education system. As an input indicator access can refer to students with different characteristics such as socio-economic backgrounds gender religions, place of residence/location (urban, rural), and (other) state or condition of being disadvantaged.

In considering internal efficiency, access is an issue in terms of the relationship between the numbers of potential, otherwise qualified students who want and seem entry to education and those who do succeed in entering and later in graduating. The differences in this ratio especially for the most disadvantaged reflects the accessibility issue.
Access is an especially important issue when, as in many countries there are not enough government resources (inputs) available to meet the demands or needs for education. Although increased quantity (more schools) could usually be provided, this would be at the cost - including decreased access - of lower quality education in fewer schools. Thus a trade-off has to be made or it happens though inertia or by default.

Inequities of participation in the system can also be found in the general area of education efficiency.

- more withdrawals and repetition
- opting for short courses rather than lengthy studies
  and in the quality of education supply:
- less qualified teachers
- scanner pedagogical support networks
- fewer books and teaching aids
- school buildings of less quality

Indicators of equity in internal efficiency include:

Availability of schools (In part equity simply means ensuring that enough schools are available)
- gross enrolment ratio - by region district urban/rural
- net enrolment ratio - by region district, urban/rural
- female vs. male enrolments -by level, and by region, district, urban/rural
- trends in female enrolment (and its effects on population increase)
- variation in student-teacher ratio by school district level
- female vs. male placement in test scores by quartile by level, and by region, district, urban/rural
- distribution of total expenditure per student - by level, district and school, and urban rural
- government expenditure on education per student by grade - urban/rural
- variation in salaries per teacher - urban/rural by gender
- variation in the number of books per student - by school, district, level

3. **External Efficiency**

Accessibility as an element of equity in external efficiency refers to the difference between the number of such student groups who participated in the system as compared with those who completed it successfully, i.e. graduated.

Equity, as an effect of output, is reflected in the results of participation in education by different population groups of students as beneficiaries.

Equity in output and outcomes is usually closely related to inputs. Students for whom equity is an important consideration in the likelihood of their being part of the output are usually the same groups as those for whom equity in access is critical.

The following questions are important in external efficiency.

What is the distribution of attainment among the various disadvantaged groups of students?

- What is the distribution of achievement among the same groups?

  (Comparisons of test scores among disadvantaged, geographical, gender, socio-economic
and other groups allows for some conclusions on whether the education provided has had a positive, negative or neutral effect on the perceived initial disadvantages of such groups).

• How successful are these students as compared with others, integrate into the labour force after leaving school?

Indicators of equity in external efficiency include:

• comparative learning achievement of girls vs. boys
• percentage of students from lower income family backgrounds who graduated
• experiences in the labour force of females vs. males and the disadvantaged groups as compared with the others

A crucial question is how the factors of internal efficiency and external efficiency combine to affect quality in education. One implication is that the somewhat intangible yet very real, factors of good management and leadership are essential in affecting quality.

H. INDICATORS OF QUALITY AT DIFFERENT LEVELS

There are several kinds of levels of education. The most common are levels or sectors of provision: pre-primary, primary, secondary, technical/vocational, teacher training, higher secondary, university.

Levels of hierarchy refer to authority levels within a sector level - inspector, principal, head teacher, teacher.

Levels of location refers to geographical considerations - district/country, urban and rural or central and local.

Indicators appropriate to one level will not necessarily be inappropriate at another.

This section of the EMIS Training Manual provides examples of indicators of quality that might be used at different geographical (location) levels of an education system - indicators that could be integrated into the framework of the EMIS you will develop.

1. Local Level

This usually means the level of individual schools or clusters (groupings) of schools. In some smaller countries it could mean a school district governmental district zone or atoll.

These indicators will be especially relevant for a particular school or small school cluster (up to five primary schools). For the principal, indicators of quality will likely refer to:

• the availability of textbooks
• adherence by teachers to the specific content of the prescribed curriculum (teaching) in the school
• improvements in specific literacy areas, or in daily attendance rates of both teachers and students

Indicators at the local level may be considered in terms of the following broad groupings.
context indicators: pre-conditions for improving quality, e.g. improved library facilities

process indicators: what is taught and how it is taught, e.g., quality of subject matter knowledge on the part of teachers

learning performance indicators: quality of evaluation strategies, e.g., assessment by teachers and students self-assessment

For individual class teachers, the time spent monitoring and evaluation student performance and achievement is helpful. Appropriate indicators can be used regarding frequent testing and quizzes in class, especially to provide immediate feedback to students.

Other indicators can be developed for evaluations of teachers through frequent visits by inspectors and supervisors, or by school principals.

When seeking evidence of improvement in educational services, the following local-level indicators can be used together with others that offer promise. However, these indicators affect quality in education, but do not determine it.

- average academic qualifications of teachers in the school
- number of sitting and writing places in the classroom related to number of students in the class
- number of textbooks
- number of exercise books notebooks etc.
- number of books shelves
- amount of space in the classroom
- number of toilets for girls
- pupil-teacher ratio

Other factors (indicators) that affect the quality of education at local or district level include:

- overall time on task by pupils
- collaboration between teachers and the existence of a collaborative culture in the school
- leadership in the school/district through modelling which encourages attention to improving learning through teacher collaboration in planning
- school-community relations, including meaningful parent participation
- teacher involvement in the community
- higher-level resources and how they are used by the school to improve itself

2. Country Level

For the country as a whole, appropriate indicators of educational quality are likely relate to the overall performance of the system.

These include such factors as system-wide dropout rates, repetition rates, levels of teacher absenteeism, or disparity between male and female literacy rates in rural areas of the country.

The following country-level indicators can be used:

- student characteristics
I. Limitations in the Use of Indicators

Regardless of how good the specification of indicators can be, there are sometimes limitations in the indicators themselves.

These limitations arise from the use of an indicator, including the matter of interpretation. Some of the limitations mentioned or discussed below overlap with the listing of characteristics in section c above, but here the focus is on the factor of constraint.

The major limitations, or constraints, are the following:

a) as proxies, indicators represent an oversimplification of reality
b) often there is a delay in the availability of indicator information
c) sometimes indicators cannot be collected and analyzed cost-effectively
d) there may be a lack of incentives to contribute to, or use indicator information
e) there may be possible negative incentives. (It is not always true that improved system efficiency is an incentive for officials to willingly support an EMIS. What improves a country system does not necessarily improve the lot of some individuals involved with that country’s EMIS).
f) a positive change in the indicator measured does not necessarily provide evidence that positive change is taking place (reliability).
g) Sometimes the information provided by an indicator is not valid, i.e., is not genuine or legitimate, perhaps because of deliberate distortion. Enrolment data provide a good example, e.g. from failure to take account of absenteeism, dropouts and other variations in attendance during the school year, or from deliberate overestimation of enrolment statistics by head teachers. (This can occur if the allocation of teachers, funds equipment and other advantages is usually determined by enrolment figures).
h) Aggregation factors:
   - Indicators can take on different meanings at different levels of analysis.
   - Aggregation tends to obscure details needed to answer certain types of questions.
   - Managers need to retain and use information at the individual and class levels.
   - The intention to collect data in great detail can serve no purpose if principals and teachers see that many of these data are not used.

i) There is the risk of inappropriate inference. Statistics of indicators depend on a variety of factors and always need to be interpreted carefully. For example, although the student/teacher ratio can help identify overcrowded classroom situations, it is not always an indicator of good teaching in those classrooms. Similarly, a high student/class ratio doesn’t mean that the teaching must be poor quality.

A low student/teacher ratio is almost always assumed to reflect a positive situation, and vice versa, but sometimes the reverse is true in both cases. Ratio data do not tell us anything about teacher motivations or what happens inside a classroom.
Small classes maybe important but it is what happens in them that is crucial. In rural areas, classes may be much smaller than those in urban areas, but the quality of teaching may be much poorer. There are many possible reasons for this. For example, teachers in rural areas may not enjoy the same amount of teaching and training support as teachers in urban areas. Also, teachers attracted to rural areas might be less well equipped, and students more deprived — not only in terms of the quality of the teaching environment, but also concerning their own socio-economic backgrounds.

j) Although statistics illuminate a particular situation, in themselves they do not tell us what to do to overcome its problems. For example, statistics on teacher qualifications might suggest that more qualified teachers are required in an education system, yet there are many different ways of responding to such data. To raise standards one might turn to in-service training for existing teachers, to teacher training of new recruits or to recruitment from abroad. All are logical options, and the ultimate decision is likely to depend on a variety of factors, including costs.

k) National indicators of quality are likely to be advantageous for planners at sub-national levels.

l) Indicators may be used uncritically for assessment, or for reward or punishment.

m) Highly specific targets based on indicator information may result in achievement that falls below the standards set according to the targets.

n) Politics may adversely influence the selection and rejection of indicators.

Strategies to overcome these limitations should focus on the school and classroom levels, as it is here that most data collection and problems arise (reliability, validity and other constraints of indicator information).

The most promising strategy may be to involve teachers, especially in the conceptualization, development and use of their own information systems.

It must be emphasized that collection and use of information should be part of a larger commitment to self-examination and self-assessment, individually and collectively, by administrators and teachers, as well as students and parents.
A. Rates and Ratios

This paper presents the definition and computational procedures of the measures of the educational system’s performance. Using the data available in the EMIS data bank, several key indicators can be derived. The following are key indicators which can measure the efficiency, effectiveness, equity and quality of the education system.

1. Participation Rate or Net Enrolment Rate (PR or NER)

The percentage of the 10-12 years old enrolled in the middle school to the population of the same age range.

\[
PR \text{ or } NER = \frac{\text{No. of 10-12 years old enrolled in Sy 1998-99}}{\text{Population of 10-12 age grouped, 1998}} \times 100
\]

2. Gross Enrolment Ratio (GER):

The percentage of the age-group population 10-12 years enrolled in SY 1998-99 in the middle school.

\[
GER = \frac{\text{Total middle school enrolment in SY 1998-99}}{\text{Pop.(10-12 year) in 1998}} \times 100
\]

3. Retention Rate

The percentage of the enrolment in any school year that continues to be in school the following year.

\[
RR = \frac{\text{Enrolment in Grade 7-8, SY 1998-99}}{\text{Enrolment in Grade 6-7, SY 199-98}} \times 100
\]

4. Transition Rate

The percentage of students who graduated from one level of education and moved on to the next higher level.

\[
TR = \frac{\text{No. of students enrolled in grade 6 in Sy 1998-99}}{\text{No. of Primary school graduates (grade 5) in SY 1997-98}} \times 100
\]

5. Cohort Survival Rate

The percentage of the enrolment of a certain cohort of students in the beginning grade at a certain level of education who reached the final grade of the required number of years for the level.

\[
CSR = \frac{\text{Enrolment in Grade 8 in SY 1998-99}}{\text{Enrolment in Grade 6 in SY 1997-98}} \times 100
\]
6. Drop-out rate

The percentage of students who left school during the school year to the total number of students enrolled during the previous school year.

\[ DR = \frac{\text{No. of drop-out in Gr.6-8 in Sy 1998-99}}{\text{Total enrolment in the middle school SY 1997-98}} \times 100 \]

7. Repetition Rate

The percentage of students who enrolled in the same grade more than once in the school year \(N\) to the total number of students enrolled in the same grade during the previous school year.

\[ RR = \frac{\text{No. of students who repeated Grade 6 in SY N(1998-99)}}{\text{No. of students enrolled in Grade 6 in SY N-1(1996-97)}} \times 100 \]

8. Graduation Rate

The percentage of graduates of a certain level of education in a given school year to the total enrollment in the terminal year of the same level.

\[ GR = \frac{\text{No. of graduates in GR. 8, SY 1998-99}}{\text{No. of Grade 8 enrolled in SY 1998-99}} \times 100 \]

9. Completion Rate

The percentage of students completed (graduates) the particular cycle of education to those enrolled in first year of the cycle.

\[ CR = \frac{\text{No. of graduates in the middle school (grade 8) SY 1998-99}}{\text{No. of students enrolled in grade 6 in SY 1996-97}} \times 100 \]

10. Student – Teacher Ratio

The proportion of the students enrolled in a certain level at a given school year to the number of teachers teaching them. On the average, the number students to a classroom teacher.

\[ PTR = \frac{\text{Enrolment in the middle schools (grade 6-8)}}{\text{No. of teachers in the middle schools (grade 6-8)}} \]

11. Class -classroom Ratio

The relative value of the number of classes to the number of classrooms.

\[ CCR = \frac{\text{No. of Classes in the middle schools (grade 6-8)}}{\text{No. of classrooms Used/Available}} \]
12. Student-Textbook Ratio

The proportion of the enrolment at a certain level in a given school year to the number of usable textbooks available at the same level in the same school year. On the average, it is the number of textbooks for every student.

\[
SST = \frac{\text{Enrolment in the middle school (grade 6-8)}}{\text{Total number of available usable textbooks}}
\]

13. Per Student Cost

The ratio of the total education expenditures to the total enrolment in a given school year.

\[
PSC = \frac{\text{Total Expenditures (salaries + other school operating expenses) for middle school in SY N}}{\text{No. of students enrolled in middle school in SY N}}
\]

B. PROJECTION METHODOLOGIES

As used in educational planning and management, projection is defined as an estimation of future enrolment or the number of teachers employed based on years data. Educational planners and managers cannot calculate future requirements in school plants and facilities, additional teachers needed and budgetary allocation for education unless they have an adequate idea of how many students will enter the school system, how many will proceed through the grades/class and how many students will graduate during the planned period.

1. Projection on the Basis of Past Trend

Data requirements:

a. Five (5) or more school years of student enrolment by grade/class
b. Best estimates of future beginning grade/class (grade 1) enrolment

Given the following enrolment for each grade/class and school year in District X

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<td>4221</td>
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</table>

Future beginning grade enrolment is estimated or projected by applying the average increase/decrease of the five (5) school years of actual enrolment in Grade 6.

From the above table the average increase/decrease of grade 6 enrolment is:
The estimated beginning grade enrolment is:

1999-2000 = 5220 + 69 = 5289
2000-2001 = 5289 + 69 = 5358
2001-2002 = 5358 + 69 = 5427

Practical Exercise:
Find the future enrolment of grades 7 and 8 using the above methodology.

2. Actual Grade to Grade Survival Rates

Survival Rate = \( \frac{\text{current enrolment in Grade } n}{\text{previous enrolment in Grade } n-1} \times 100 \)

Example:

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<tr>
<td>92.72</td>
<td>94.18</td>
<td>83.60</td>
<td>91.64</td>
<td>96.06</td>
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</tbody>
</table>

Three assumptions are presented in this method of projection:

1.) **High Assumption** – the high variant assumes a constant enrolment and computed by using the average of the three (3) highest survival rates.

\[
\frac{92.72 + 94.18 + 96.06}{3} = 94.32
\]

2.) **Medium Assumption** – the medium variant assumes a moderate enrolment and computed by using the average of the five (5) survival rates.

\[
\frac{92.72 + 94.18 + 83.60 + 91.64 + 96.06}{5} = 91.64
\]

3.) **Low Assumption** – the low variant assumes a rapid decline in enrolment and computed by using the average of the three (3) lowest survival rates.

\[
\frac{92.72 + 83.60 + 91.64}{3} = 89.32
\]

The crusade for the pursuit of attaining universal goal of education for all continues after more than two decades of action. There are successes and failures reported across the globe. However, in general, there are still efforts that need to be done in order that the goals can be attained significantly. The positive lessons and successes need to be sustained while failures need to be improved or strengthened. Since the World Conference on Education for All (EFA) in 1990 held in Jomtien, Thailand, the implementation of the EFA plans and programs brought new issues and challenges as a result of the rapid changes taking place in the society. For developed countries, new strategies have been adopted and more resources have been channeled to various educational programs and projects designed to sustain, if not to improve further the performance of the education system. On the other hand, developing countries characterized with poor performance and limited resources, continue to struggle and markedly lagged behind the better performing countries in terms of attaining their EFA goals and objectives. Educational services are poor and inadequate. More often than not, these services are not available. A big number of school-going age children continue to be deprived of access to basic education. Those who were given the opportunity to be in school cannot continue to survive and finish schooling. A number of concrete reasons have been mentioned to be the cause of very low completion and high incidence of dropouts.

The various country reports apparently are contradicting with what is actually obtaining and first hand knowledge of the situation. Reports contain inaccurate and conflicting data, the concepts and definitions of educational terms and measures are not consistent and standardized, data do not represent the entire population, levels and location. The comprehensiveness updatedness and degree of reliability create some imbalances and distortion in describing the true picture of the education situation.

The new millennium signals new imperatives, new demands, new challenges and priorities for the education sector. It requires better articulation, coordination and collaboration with the other sectors. To be able to put things in proper perspectives and rectify certain actions/measures, a new plan of action need to be formulated. The new EFA goals set for the next decade become the focal points of any planning efforts. These can only be realistically translated into more viable terms of action with data and information derived from accurate and reliable source and acceptable system of collection. The Education Management Information System (EMIS) is a potential management tool to bring about a reliable, accurate and timely characterization of the state of education. It can provide comprehensive answers to questions such as: what is it? why is it? where is it? how is it? when is it? and by whom is it? A thorough understanding of the current education situation is essential to effective planning formulation.

A. THE PLANNING FRAMEWORK

The Planning focus is the Child. The concern is access to schooling, access to learning, quality of the teaching and learning process, relevance of the teaching-learning process, content and structure of the curriculum, learning achievements and support system to the enable the child survive and finish his education.

The Planning Process involves the task of analyzing/review the sector in terms of the structure and performance of the system based on the relevant indicators, the management of the education system, and the policies, and programs that provide directions in the attainment of the goals and objectives of the system. Specifically, the sector should attempt to analyze the
following components of the education system: the development of the students/clientele, the profile of the teachers/trainers, the contents of the curriculum, the instructional materials, the physical plant and facilities, the financial resources, school-community partnership and the delivery modes. The analysis should be both qualitative and quantitative in nature. After identifying the issues, problems, gaps, shortfalls, threats, opportunities and strengths, the strategic policies, goals and objectives can be formulated. In order to make the plan more output oriented, viable and realistic targets should be set. These can be stated in terms of indicators or measures which eventually become the yardstick of performance. The actualization of these objectives and targets depend on the appropriateness of the programs and projects designed to realize the mandate of the plan. These programs/projects/tasks which constitute the package of action to address the various of the plan need to be elaborated to ensure a better understanding of the rudiments and imperatives of the action. The elaboration can provide a realistic and accurate estimates of the funds needed for the implementation of the plan. The implementation of the plan signals the actualization of the plan. Using various tactics and strategies, the plan need to have a clear and well defined terms of reference so that the role and responsibilities of the various implementers or actors can be better understood and carried out. The activities during the period of implementation need to be monitored to determine whether the activities are proceeding according to the schedule. In the process of implementation certain problems or bottlenecks will come along the way that may cause the delay or restrict the efficient and effective delivery of the plan. An effective monitoring system should be able to identify these barriers. Results are expected to be derived from the implementation process. These should be assessed and evaluated to determine its effect or impact to the target beneficiaries and to the overall goals of the plan.

B. EDUCATION FOR ALL (EFA) GOALS FOR THE YEAR 2015

For the next decade and a half, the following goals have been defined and agreed upon during the World Education Forum in Dakar, Senegal. Other goals and objectives may be formulated by the respective member states in addition to these common goals reflecting the unique and distinct conditions and concerns on education.

- Expanding and improving comprehensive early childhood care and education for the most vulnerable and disadvantaged children
- Ensuring by 2015 all children, particularly girls, children in difficult circumstances and those belonging to ethnic minorities, have access to and complete free and compulsory primary education of good quality
- Ensuring that the learning needs of all young people and adults are met through equitable access to appropriate learning and life skills program
- Achieving a 50% improvement in levels of adult literacy by 2015, especially for women, and equitable access to basic and continuing education for all adults
- Eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015 with focus on girls
- Improving all aspects of the quality of education and ensuring excellence especially in literacy, numeracy and essential life skills
C. DIAGNOSIS/SITUATIONAL ANALYSIS

In conducting a diagnosis or situational analysis, the following questions may serve as guide to bring out a more realistic and comprehensive picture of the education system:

➢ What is the current status of the EFA programme? To what extent were the objectives and targets of the previous plan been achieved? What are considered the strengths, weaknesses, threats and opportunities of the education system.

➢ What are the lessons from our past experiences in implementing the programme?

➢ What data are necessary for proper planning and how are these data collected?

➢ What are the long and short-term goals of the programme?

➢ What should be nature of macro level perspective plans as well as micro level plans for achieving the specified targets?

➢ How does one ensure that the plans developed would be adequately cater to the needs and aspirations of the disadvantaged sections of the population?

➢ How to visualize alternate scenarios of action in the context of the national goals, priorities and resources available in the country?

➢ What strategies facilitate community participation?

➢ What are the various sources from which one can mobilize financial resources?

➢ What are the alternative strategies adopted for implementing the program?

➢ What are the steps involved in formulating and implementing programmes and projects?

➢ How to ensure flow of information?

D. DEVELOPING THE PLAN PERSPECTIVE

The plan may be prepared according to the time horizon, level/scope and coverage. The planning body should consider the projected requirements and resources needed in attaining the goals. A more time bounded actions should be indicated in the plan for better strategic and rationale allocation of resources.

➢ Long-term and short-term Plans

➢ Macro-level and Micro-level Plans

➢ Need for Capturing a Disaggregated Picture: geographical location, religious minorities, ethnic groups, economically backward groups, and male-female disparities
E. EVOLVING AN INTEGRATED PLANNING FRAMEWORK

Consider the following in evolving a plan by integrating the various concerns:

1. Policy decision and target setting
2. Integrated planning and resource mobilization
3. Increasing enrolment
4. Prevent/reduce drop-outs
5. Enhancing Quality
6. Special programmes for disadvantaged groups
7. Non-formal education for out-of-school children
8. Functional literacy classes levels, I,II and III
9. Skills training
10. Continuing education

F. Project Planning and Management Cycle

1. PROJECT IDENTIFICATION
   - Need Base
   - Existing Priorities
   - Programme Thrusts
   - Relevant Social trends
   - Availability of Resources

2. PROJECT FORMULATION
   - Objectives, Methods
   - Duration, Agencies Involved Cost

3. PROJECT APPRAISAL
   - Preliminary Appraisal
   - Feasibility Study
   - Local Relevance
   - Resource requirement
   - Implementation Problems

4. PROJECT APPROVAL
   - Technical, Financial
   - Political
   - Administrative

5. PROJECT IMPLEMENTATION
   - Organization Inputs
   - Implementation Strategy Action
   - Sequence Control
   - Mechanism

6. PROJECT EVALUATION
   - Context Evaluation
   - Input Evaluation
   - Process Evaluation
   - Product Evaluation
G. A FRAMEWORK SHOWING THE RELATIONSHIP OF EFA PLAN WITH OTHER PLANS AND STRATEGIC ACTIONS

The initiatives of other sectors, organizations, etc. can be input to the EFA Plan to come up with a more holistic and focused approach in addressing the problem of EFA. A viable mechanism should be adopted to identify the common concerns and leave to the respective sector/organization concerns distinct to them.

H. WHAT IS EDUCATIONAL PLANNING?

Educational Planning is a process of preparing a set of decision for future action directed toward achieving goals by optimal means.

- Educational Planning is a conscious determination of course of action to achieve pre-concieved objectives. It is deciding in advance what is to be done by whom it is to be done, how it is to be done. It ranges from the detailed, specific and rigid to the broad, general and flexible design.
**I. WHY IS THERE A NEED FOR EDUCATIONAL PLANNING?**

- basis for evaluating/assessing performance of the educational system
- effect equity in the distribution and utilization of resources
- for quality improvement
- for the needed change, reform and innovation
- maximize the use of limited resources
- bring about a well-balanced educational system
- correlate education effort with national policy
- balance development for both quantitative expansion and qualitative improvement
- ensure that the investment in education brings good dividends or returns
- improve the effectiveness and efficiency in the delivery of educational services
- narrow the gap of educational deprivation
- basis for appropriate intervention

<table>
<thead>
<tr>
<th>J. STAGES IN EDUCATIONAL PLANNING</th>
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<td>(1) PRE-PLANNING</td>
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<td>- Mission and Vision</td>
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<td>- Nat'l Development Goals</td>
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<td>- Administrative Machineries</td>
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<td>- Staff Orientation</td>
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<td>- Data/Information Needs/Requirements</td>
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<td>Educational Diagnosis-</td>
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<td>Qualitative and Quantitative</td>
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<td>- Identify Problems, Gaps,</td>
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<td>(3) PLAN FORMULATION</td>
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<td>- Goals, Objectives,</td>
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<td>- Packages of Action</td>
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<td>- Projects</td>
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<td>- Activities/Tasks</td>
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<td>- What, Who, How, When and Where?</td>
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<td>- Linkages and Coordination</td>
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<td>- Work and Financial Planning</td>
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<td>(6) PLAN MONITORING,</td>
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<td>EVALUATION, REVISION</td>
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<td>AND REPLAN</td>
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<td>- Targets vs. Accomplishments</td>
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<td>- Success Indicators</td>
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<td>- Restate Objectives</td>
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<td>- Reset Targets</td>
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<td>- Modify Strategies</td>
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<td>- Reformulate Policies</td>
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<td>- Revise Programs/Projects</td>
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K. OVER ALL STRATEGIES OF ACTION

To help ensure the efficient and effective planning and implementation of activities and in attaining the goals set in the plan, the following strategies may be adopted:

1. Strengthening National Commitment to promote basic education for all
   1.1 Preparation of national plan of action.
   1.2 Organization of national/regional – sub regional conferences and seminars.

2. Enhancing Equity: reaching the unreach
   2.1 Education for girls and women.
   2.2 Rural/isolated areas.
   2.3 Urban slums (squatters)
   2.4 Special groups (minorities, nomadic groups)
   2.5 Disabled groups

3. Use of mass media to promote basic education
   3.1 Social mobilization and advocacy
   3.2 Raise public awareness – campaign
   3.3 Preparation and distribution of posters, pamphlets

4. Consolidating co-operation among local government units, non-government organizations
   4.1 Organize technical working group
   4.2 Joint project development and implementation
   4.3 Integrated planning
   4.4 Exchange of experiences and information


L. PROBLEMS IDENTIFIED BY THE PARTICIPANTS DURING THE TRAINING WORKSHOP CONDUCTED FOR THE MINISTRY OF EDUCATION OFFICIALS AND REPRESENTATIVES FROM DIFFERENT NATIONAL AND INTERNATIONAL ORGANIZATIONS ACCORDING TO THE FOUR MAJOR GOALS OF EFA

1. Early Childhood Care and Development (ECCD)
   1.1 Of the 1.3 million pre-school age children, only 4.2% participate in ECCD
   1.2 There are not enough pre-schools
   1.3 Poor sanitary and hygiene condition
   1.4 Shortage of qualified/trained teachers
   1.5 Low Salary of teachers
   1.6 Inadequate and poor quality of training/learning materials etc. books, toys,
   1.7 Traditional/old fashioned methods of teaching
   1.8 Absence of medical and nutrition services
   1.9 Low level of family income
   1.10 Lack of appropriate data to describe the ECCD situation
   1.11 Poor facilities such as latrines, heating, sports, water system
2. Universalization of Primary Education (UPE)

2.1 Shortage of classrooms, learning materials
2.2 Dilapidated and condemned classrooms are still in use
2.3 Traditional/old fashioned and irrelevant curriculum contents
2.4 Shortage of qualified teachers (about 11 thousand teachers are under-qualified)
2.5 Need for in-service training of teachers to upgrade their competence
2.6 Dearth of teacher training materials
2.7 Low morale of teachers due to low salary and benefits
2.8 Lack of funds to finance school activities
2.9 Low level of family income
2.10 Poor communication or linkage between the schools and the communities
2.11 Poor management skills of school heads
2.12 Difficulty due to remoteness or far distance of schools
2.13 Lack of hygienic/sanitary school facilities
2.14 Big class sizes, high dropout rate, imbalance textbook:student ratio
2.15 Obsolete teaching strategies and learning materials
2.16 Unclear policy on language use and category of schools

3. Girls/Women Education

3.1 Poor living condition of the families; low participation of girls in school
3.2 Existing tradition and beliefs which inhibit girls to go to school
3.3 Big number of family members which the adult women and girls are asked to take care of the young ones
3.4 Lack of recognition and motivation for girls to enter secondary schools
3.5 Early marriage among girls
3.6 Lack of work opportunities for girls
3.7 Far distance of schools and remoteness of villages
3.8 Lack and poor school facilities intended for girls
3.9 Absence of learning experiences for personality development of girls and how to become wife or mother

4. Continuing-Lifelong Education

4.1 Lack of interest of parents and adult to attend literacy programmes
4.2 Lack of clear-cut policy on the compulsory 9-year education
4.3 No regulation or clear policy regarding dropout students
4.4 No NFE system exists or available
4.5 Absence of reliable and accurate data on the number illiterates
4.6 Lack of evening classes for working and non-working adults
4.7 Some non-formal classes are organized but no students
4.8 Shortage of self-learning materials
4.9 Inadequate if not poor facilities of learning centers for literacy classes
4.10 Inadequate provision for livelihood and other skills training
M. PROPOSED PLAN OF ACTION

<table>
<thead>
<tr>
<th>Priority Problems on ECCD</th>
<th>Proposed Course of Actions</th>
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<tbody>
<tr>
<td>1. Lack of Funds</td>
<td>1.1 Involvement of Foreign/international donors</td>
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<td>1.2 Utilize the non-government budget</td>
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<td>1.3 Usage of tax for education (establishment of Education Fund)</td>
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<td>2. Lack of ECCD Educational Programmes</td>
<td>2.1 Development of learning and teaching materials</td>
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<td></td>
<td>2.2 Need for quality pre-service and in-service trainings for teachers</td>
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<td>3. Rehabilitation/repair of Pre-schools</td>
<td>3.1 Reconstruction of facilities</td>
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<td></td>
<td>3.2 Preparation and publication of teaching/learning materials/tools</td>
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<td></td>
<td>3.3 Provision of standard hygiene/sanitary/nutrition programme</td>
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<td>4. Poor Health Services</td>
<td>4.1 Provision of clinic-based, family-based pre-schools</td>
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<td></td>
<td>4.2 Provision of medical services</td>
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<td>5. Family Treatment</td>
<td>5.1 Conduct massive Family training on the importance and benefits of ECCD</td>
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<td>5.2 Continuous advocacy with the help of media and community leaders</td>
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N. PROPOSED OUTLINE FOR THE TAJIKISTAN EFA PLAN OF ACTION, 2002-2015

INTRODUCTION

- overall description of the Tajikistan’s present system of education
- organizational and management structure of the education system
- mandates, policies, goals and objectives of education
- quantitative and qualitative analysis of the overall performance of the education system-sector analysis: identify the strengths, gaps, shortcomings, shortfalls vis-à-vis targets, etc.

Chapter 1 – EARLY CHILDHOOD CARE AND DEVELOPMENT

1.1 access and equity: issues and problems
1.2 available services: education, health, nutrition and family well-being
1.3 government and non-government support
1.4 priority objectives and targets
1.5 proposed interventions and actions (programmes, projects)
Chapter 2 – UNIVERSALIZATION OF BASIC EDUCATION

2.1 access, equity and quality: issues and problems
2.2 performance of the basic education sector: enrolment, holding power (dropouts, repeaters, etc.), learning achievements of students, teachers' qualification and performance, welfare and benefit, management and supervision of schools, inventory infrastructures and facilities, provision of textbooks and other learning materials, curriculum reform and enrichment, school-community partnership, etc.

2.3 primary objectives and priority targets
2.4 proposed interventions and actions (programmes, projects)

Chapter 3 – GIRLS AND WOMEN EDUCATION

3.1 access and quality: issues and problems
3.2 advocacy, support mechanism and opportunities
3.3 immediate concerns and targets
3.4 proposed interventions and actions (programmes, projects)

Chapter 4 – CONTINUING – LIFELONG EDUCATION

4.1 quality and relevance: issues and problems
4.2 identification of beneficiaries, clientele, learners (who are they and where?)
4.3 service providers and training modalities
4.4 provision of services: literacy, livelihood and skills development trainings, learning materials and facilities provided
4.5 advocacy, opportunities and support mechanism for sustainability
4.6 focus and targets
4.7 proposed interventions and actions

Chapter 5 – EDUCATION MANAGEMENT AND EMIS

5.1 efficiency, effectiveness, and approaches: issues and problems
5.2 management of the school system: national and local government participation; supervision and control; policy, plan and programme development, implementation, monitoring and evaluation
5.3 system of data collection, processing, analysis, report generation, dissemination and utilization
5.4 strengthening and decentralizing of EMIS
5.5 challenges and targets
5.6 proposed interventions and actions

Chapter 6 – INVESTMENTS AND FUNDING REQUIREMENTS

6.1 estimated cost by programme/project
6.2 national budget allocation to education
6.3 local government support
6.4 community, NGOs, individual initiatives/contributions
O. DATA ELEMENTS IDENTIFIED BY THE PARTICIPANTS

STUDENTS/LEARNERS MIS

- Total number of students by sex and age
- Total number of students by grade/year level
- Total number of students by class
- Total number of students by language spoken
- Number of shifts of classes
- Number of dropouts by grade/year level, sex
- Number of repeaters by grade/year level, sex
- Number of promeetees by grade/year level, sex
- Number of pre-school children by sex and age
- Number of transferees-in/out by grade/year level
- Number of children physically disabled
- Number of graduates

TEACHERS/TRAINERS MIS

- Total number of teachers by grade/year level and sex
- Total number of teachers by educational qualification (middle, higher)
- Total number of teachers by category: pedagogy, secondary, high and level 1st, 2nd, general
- Total number of students by subject area
- Total number of teachers by training courses and type
- Total number of teachers by certification by year
- Number of teachers retired and hired again to teach
- Number of teachers by teaching load
- Number of teachers by full-time and part-time
- Number of teachers teaching 2 or more subjects
- Number of teachers by residence
- Number of teachers retiring and leaving the teaching profession

CURRICULUM/TRAINING AND LEARNING MATERIALS MIS

- Training Programmes according to curriculum
- Availability of programmes by grade
- Number of subjects by grade
- Number of hours taught by week
- Teaching course for teachers
- Additional classes after official curriculum
- Subject selection by schools
- Training pedagogical skills (cluster of schools)
- Activities by methodological units/councils in schools
- Training course for teachers
- Number of books in the library by subject
- Number of posters/visual aids prepared by teachers
- Media of instruction
- Number of training materials and textbooks by language used
- Availability of self-training plans for teachers
- Availability of extra-curricular activities by type e.g. clubs, organizations, associations
- Number of supplementary materials by subject and grade level
- Number of teachers guide by subject and grade level
- Availability of testing materials by subject and by grade level
- Number of students took the examination
- Number of students passed/failed

SCHOOL INFRASTRUCTURE AND FACILITIES

- Type of School (primary/basic secondary/secondary)
- Management of school (public, private)
- Certification of school
- Profile of the school: year established, address
- Type of construction: permanent-concrete, semi-permanent-wood, makeshift-bamboo, hays/leaves
- Area of school site(s); ownership of the school site: owned, donated, rented
- Number of classrooms and use: classes, office, laboratory, library, kitchen, medical room
- Number of equipment by type e.g. computers, ohp, cabinets, typewriters
- Availability of facilities: heating, water, electricity, gas, latrines

Schedule of school renovation/rehabilitation

P. DEFINITION OF TERMS

1. **Cohort Survival Rate** – percentage of pupils/students enrolled at the beginning grade/year of the level of education who reached the final grade/year at the end of the required number of years of that level of education.

2. **Completion Rate** – the percentage of pupils/students enrolled at the beginning grade/year of the level of education who finished or graduated from the final grade/year at the end of the required number of years of that level of education.

3. **Data** – refers to the smallest unit or item which represents a fact, e.g. name, sex, status, age, etc.

4. **Database** – refers to all related files compiled or put together as one group.

5. **Dropout Rate** – refers to the percentage of pupils/students who for any reason leave educational institutions during the school year (in any given grade or level) and did not come back to finish the grade or level during that school year to the total number of pupils/students enrolled during the previous school year.

6. **Graduation Rate** – the percentage of pupils/students in the last grade/year of that level of education who completed and passed the academic requirements of that last grade/year.
7. **Gross Enrolment Ratio** – refers to the total enrolment of students in a grade or level of education, regardless of age, expressed as percentage of the corresponding eligible official age group population in a given school year.

8. **Net Enrolment Ratio/Participation Rate** – refers to the number of students enrolled in the official specific-age group expressed as a percentage of the total population in that age group.

9. **Repetition Rate** – percentage of pupils/students who enroll in the same grade/year more than once to the number of pupils/students enrolled in that grade/year during the previous year.

10. **Retention Rate** – percentage of students who enroll in any given school year that continues to remain in education institution the following year.

11. **Teacher-Student Ratio** – refers to the proportion of teachers in relation to the number of students in an institution.

12. **Transition Rate** – percentage of students who graduated from one level of education, e.g. primary education, secondary education, etc. and moved on or enroll to the next higher level, e.g. junior secondary, higher secondary, etc.